

EXPLORING THE EFFECTS OF ORGANISATIONAL CULTURE ON
INNOVATION:

A MIXED-METHODS STUDY OF MULTINATIONAL
SUBSIDIARIES IN THE IRISH ICT SECTOR



Coláiste na Tríonóide, Baile Átha Cliath
Trinity College Dublin

Ollscoil Átha Cliath | The University of Dublin

Frauke Wolf BBS, ACMA, CGMA

Trinity Business School

Trinity College Dublin

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DECLARATION

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ABSTRACT

This research explores how organisational culture affects innovation in subsidiaries of multinational corporations (MNCs) in the Irish information and communications technology (ICT) sector. Much recent discourse has highlighted the supporting role of organisational culture in regard to stimulating innovation, which has culminated in the emergence of the concept of an innovation-supportive culture (Jassawalla & Sashittal, 2002). Whereas it is recognised that organisational culture has an impact on the level of innovation in an organisation and can either support or hinder the implementation of innovations (Ahmed, 1998; Jassawalla & Sashittal, 2002), little is known about this association in the context of the multinational subsidiary.

This research seeks to conceptualise a supportive organisational culture in a subsidiary as an antecedent to innovation at the subsidiary level. The research questions are ‘*What dimensions of organisational culture predict the number of innovations implemented in multinational subsidiaries in the Irish ICT sector?*’ and ‘*What are subsidiary management’s perceptions of innovation-supportive organisational culture dimensions?*’ as well as ‘*What influences the relationship between organisational culture and innovation in multinational subsidiaries in the Irish ICT sector?*’.

This study was undertaken in MNCs operating in the ICT sector in Ireland. Irish subsidiaries in this sector that are Industrial Development Agency (IDA) client companies were the main subjects of this research. A sequential explanatory mixed methods research design was employed, consisting of a quantitative survey followed by semi-structured interviews with top management in selected subsidiaries. Ireland is heavily dependent on Foreign Direct Investment (FDI) and the IDA plays a role in promoting specific sectors as focus areas for investment, which provides a compelling context in which to position the current research.

The findings indicate that the dimensions of organisational culture differentially affected innovation in the subsidiaries. The effects of organisational culture also varied for the different forms of innovation. It was established that organisational culture represents a significant influence on innovation in subsidiaries. The level of subsidiary innovation was also affected by organisational systems and processes designed to support innovation, other organisational determinants, such as management support, and the headquarters subsidiary relationship.

Based on the integrated research findings, the main theoretical contribution of this thesis is the development of a theoretical model of innovation-supportive culture in subsidiaries. Overall, the findings of this thesis reveal the importance of organisational culture in supporting innovation at the subsidiary level and highlight the highly contextual nature of both organisational culture and innovation in subsidiaries. This thesis contributes to the innovativeness literature by responding to the call for a more multidimensional exploration of organisational culture (Dobni, 2008) and to the MNC subsidiary literature by responding to a call for a greater appreciation of the role of a supportive culture with regard to subsidiary entrepreneurship (Birkinshaw, 1997; Birkinshaw, Hood, & Jonsson, 1998).

PUBLICATION

During the course of the research, presentation of the work and academic peer review took place through several channels. The research and emergent findings were presented through the doctoral track at the Irish Academy of Management 2014 conference in Limerick. Also, at the Irish Academy of Management 2015 conference in Galway, the researcher presented a paper in the Innovation track. At the 23rd Innovation and Product Development Management conference in Glasgow in 2016, the paper presented formed part of the Innovation Strategies and Leadership track. In 2017, the researcher presented a paper in the International Business track of the Irish Academy of Management conference in Belfast.

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1 INTRODUCTION

1.1 Introduction

The ability of multinational corporations (MNCs) to coordinate activities across their global networks of subsidiaries is a valuable source of competitive advantage. As MNCs turn to subsidiaries for innovation, questions arise as to how best to support innovation in subsidiaries. Although organisational culture has long been considered a means of supporting innovation in organisations, the organisational culture at subsidiary level and its effects on subsidiary innovation have been relatively unexplored. This study, therefore, examines the effects of organisational culture on innovation in multinational (MNC) subsidiaries. The results of this study point to a number of organisational culture dimensions that influence subsidiary innovation as well as a number of contextual factors that impact this relationship. The Irish information and communications technology (ICT) sector is the main focus of this study owing to its centrality to the Irish economy and the large presence of multinational companies in this sector.

This chapter begins with the presentation of the rationale for and focus of the study, followed by a description of the research questions. The research methods used in this study are then detailed before outlining the limitations of this study. Finally, the structure of the following chapters is described.

1.2 Research Rationale and Focus

The central aim of this study is to gain a greater understanding of the effects of organisational culture on innovation in multinational subsidiaries. Organisational culture has long been considered important with regard to innovation and the concept of

innovation-supportive culture has been introduced to the literature in the last decade. Innovation-supportive culture is characterised by initiative-taking, creativity, risk-taking, mutual trust, early involvement, receptivity to change, autonomy, collaboration, and feedback-seeking (Jassawalla & Sashittal, 2002). While innovation-supportive culture has been a much-studied topic in international business, innovation-supportive culture at the subsidiary level has not received the same amount of attention. According to Birkinshaw et al. (1998), an entrepreneurial culture in subsidiaries supports subsidiary initiative and, in turn, innovation. A literature strand focusing on entrepreneurial subsidiaries based on research conducted on Scottish and other UK MNC subsidiaries is emerging (see Boojihawon, Dimitratos, & Young, 2007).

Numerous previous studies have reported that organisational culture is important with regard to innovation (Amabile, Conti, Coon, Lazenby, & Herron, 1996; Angle, 2000; Jassawalla & Sashittal, 2002; Kanter, 1984, 1988; McLean, 2005; O'Reilly, Chatman, & Caldwell, 1991; van der Panne, van Beers, & Kleinknecht, 2003). The main reason is that an organisation's culture is instrumental in guiding behaviour and can, therefore, serve to either support or inhibit innovation (Ahmed, 1998). In fact, organisational culture influences innovation in a number of ways: Firstly, through the process of socialisation and through basic values, assumptions and beliefs that become a guide for the desired behaviours; Secondly, by emphasising behaviours characteristic of an innovation-supportive culture such as creativity, risk-taking, freedom, teamwork, communication, and instilling trust and respect (Dobni, 2008); Thirdly, by providing a coordination function (Martins & Terblanche, 2003). The coordinating function of organisational culture can be described as creating a competitive advantage and providing a sense-making mechanism with regard to acceptable behaviour and social system stability.

Ultimately, based on the arguments detailed above, organisational culture can be considered an antecedent of innovation. Thus, organisational culture at the subsidiary level can be considered an antecedent of subsidiary innovation. This study aims to answer calls for an investigation of innovation-supportive culture at subsidiary level (Birkinshaw, 1997; Birkinshaw et al., 1998).

Further, this study addresses some of the criticism aimed at previous innovativeness research. Previous research in this area has either focused on a single dimension of organisational culture or a single form of innovation (see Dobni, 2008). This study utilises a multidimensional construct of innovation-supportive organisational culture and explores

the effects of organisational culture on four different forms of innovation. The next section briefly outlines the context of this research.

1.3 Research Context

Ireland is considered a highly globalised economy that has also been categorised as the “most MNC-dependent economy in the EU” (Gunnigle, Collings, & Morley, 2005). Ireland has reached this position due to a focus on attracting Foreign Direct Investment (FDI) which has been fundamental to its economic policy for several decades (Collings, Gunnigle, & Morley, 2008). The significance of FDI to the Irish economy becomes apparent in Ireland’s 2013 ranking as 10th in terms of FDI inflows globally, ahead of countries such as Germany, Spain and the Netherlands (Department of Jobs, Enterprise and Innovation, 2014). In 2013, Ireland attracted FDI inflows of USD 35.5 billion, which makes it one of only two OECD countries in which FDI inflows amount to more than 15% of GDP (OECD, 2014).

The strong presence of ICT firms in Ireland has also largely been driven by foreign direct investment. This has been a deliberate strategy of the Industrial Development Agency (IDA) which placed a strong emphasis on the ICT sector as one of the focus areas for investment promotion (Department of Jobs, Enterprise and Innovation, 2014). In the computer and electronic products manufacturing sector, the presence of foreign-owned affiliates in Ireland is especially high (OECD, 2013); foreign affiliates’ shares of computer equipment manufacturing turnover exceed 90% (OECD, 2009). Information and communication activities together represent almost 12% of Ireland’s value added, against an OECD average of 6% (OECD, 2013). Moreover, the ICT sector plays a central role in the world economy, the EU economy and the EU’s economic recovery, as confirmed by its pervasive impact, its inherent R&D magnitude and intensity, its innovation performance and global dynamics (Turlea et al., 2010). Thus Ireland and its ICT sector present a compelling context in which to investigate the influence of organisational culture on innovation in multinational subsidiaries. This focus has led to the development of the following research questions for this study.

1.4 Research Questions and Hypotheses

For the first, quantitative phase of this study the guiding research question was:

What dimensions of organisational culture predict the number of innovations implemented in multinational subsidiaries in the Irish ICT sector?

The hypotheses and sub-hypotheses tested in Phase One were:

H1₀: The more the organisational culture emphasises specific dimensions of an innovative culture, the higher the presence of innovation.

H2₀: The relationship of innovation to organisational culture differs for specific forms of innovation.

H2_a: Organisational culture has an influence on product innovation.

H2_b: Organisational culture has an influence on process innovation.

H2_c: Organisational culture has an influence on marketing innovation.

H2_d: Organisational culture has an influence on organisational innovation

H3₀: Organisational culture has an influence on innovation generation.

For the second, qualitative phase of this study the overarching research questions were:

What are subsidiary management's perceptions of innovation-supportive organisational culture dimensions?

What influences the relationship between organisational culture and innovation in multinational subsidiaries in the Irish ICT sector?

The questions for Phase Two were formulated after the completion of the first, quantitative phase of this study and were grounded in the results of the statistical tests that were undertaken in Phase One.

1.5 Methodological Approach

As indicated by the presentation of the research questions and owing to the topic being investigated, a mixed methods research design was deemed most appropriate. A sequential explanatory mixed methods research design was chosen for this study, which consists of a first, quantitative phase followed by a second, qualitative phase. In the first, quantitative phase data was collected using a self-administered web-based questionnaire. The questionnaire was developed following an extensive systematic review of the literature on organisational culture and innovation, combining items from existing organisational culture measures in order to assess to what extent the organisational culture supports innovation. The data collection in the second, qualitative phase took the form of in-depth semi-structured interviews with four Irish subsidiary managers. The purpose of this phase was to explain and extend the results of the first, quantitative phase. The main purpose of this research was to investigate the effects of an innovation-supportive culture on

innovation in multinational subsidiaries. A questionnaire approach to data collection alone does not allow for the investigation of the underlying reasoning behind the answers given in the questionnaire nor does it allow for the exploration of the complexities of the study context. A sequential explanatory mixed methods design which uses qualitative findings to assist in explaining and interpreting the results of a quantitative study allowed a deeper understanding of the constructs investigated in this study. Therefore, it is anticipated that the findings of this study will be of interest and contribute to the field in a meaningful way.

1.6 Contributions of the Research

This study adds to empirical work on innovation-supportive culture by exploring the effects of an innovation-supportive culture on innovation in subsidiaries of multinationals. Following the integration of the quantitative results and qualitative findings and an extensive discussion in Chapter 7, a model of innovation-supportive culture in subsidiaries is developed. Factors internal and external to the subsidiary that affect the relationship between organisational culture and innovation in the subsidiary are included in the model. This model represents the main theoretical contribution of the study and highlights the importance of an innovation-supportive culture in subsidiaries whilst also pointing towards the complexities involved.

The main contribution of this study is that it answers a call for a more multidimensional investigation of the construct of innovation-supportive culture (Dobni, 2008). Previous research has either focused on a single dimension of organisational culture or a single form of innovation. This study also contributes to the MNC subsidiary literature by providing a greater understanding of innovation-supportive culture as an antecedent of innovation in subsidiaries. This research investigates the relationship of organisational culture to innovation at the subsidiary level and thereby answers calls for further work on entrepreneurship in subsidiaries (Birkinshaw, 1997; Birkinshaw, Hood, & Young, 2005). This research has brought together arguments from the MNC subsidiary and the innovativeness literature to help devise a more comprehensive conceptualisation of innovation-supportive culture in subsidiaries.

1.7 Structure of the Thesis

This thesis is compiled of eight chapters. Chapter two provides a review of the international business literature relating to the study's context of multinational corporations and subsidiaries. It begins by highlighting the shift from the focus on MNCs to the

subsidiary as the main unit of analysis by incorporating literature on subsidiary roles and their evolution. This is followed by a discussion of innovation in subsidiaries and the related concept of subsidiary initiative. Recent developments in the headquarters subsidiary relationship are reviewed next. To close, the key construct of organisational culture with a particular focus on entrepreneurial culture in subsidiaries which has to date been undervalued as an antecedent of subsidiary innovation is introduced.

The third chapter begins by reviewing the literature on one of the core concepts of this study, innovation. The concept of innovation is defined and followed by a discussion of different forms of innovation, determinants of innovation, and the concept of an innovation-supportive culture. The next part of the chapter discusses the other central concept of the study, organisational culture. Organisational culture is defined and its complexities and dynamics are discussed. This is followed by a consideration of the measurement of organisational culture and a presentation of organisational culture typologies. Then the relationship between organisational culture and innovation is discussed. The chapter concludes with the presentation of a theoretical model derived from the literature review and the identification of five pertinent organisational culture dimensions.

Chapter four outlines the research methodology underpinning this study. Epistemological assumptions are considered first, followed by a discussion of the study's research design. The data collection and analysis methods used in the first, quantitative phase and the second, qualitative phase of the study are subsequently described before discussing the integration of the methods. The chapter concludes with an evaluation of the methodological limitations.

Chapter five presents the results from the first, quantitative phase of the study and a preliminary discussion of these results. The chapter is structured around the statistical tests undertaken based on the survey data collected. Three hypotheses and their sub-hypotheses were tested. The summary of the results of the individual statistical tests undertaken is followed by a preliminary discussion of these results. To close, the strengths and limitations of the first phase are outlined.

Chapter six presents the findings from the second, qualitative phase of the study. The presentation of the findings is structured around the themes that emerged from the qualitative analysis of the interview transcripts. Specifically, the chapter describes organisational culture, innovation, organisational determinants, and the headquarters subsidiary relationship. The chapter concludes with a preliminary discussion of the

findings from the second phase and a presentation of the strengths and limitations of the second phase.

The seventh chapter integrates the results from the first, quantitative phase and the second, qualitative phase and presents a discussion of the integrated findings. This is followed by a discussion of the theoretical model of innovation-supportive culture in multinational subsidiaries which has been refined and expanded by incorporating the findings of the study. The chapter concludes with a presentation of the implications of the key findings.

The final chapter draws together the findings from both the quantitative and the qualitative phase and the theoretical framework outlined earlier in the thesis to present a conclusion. It concludes with a summary of the major contributions of the study before outlining the limitations of the research and proposing directions for future research.

2 THE SETTING: MULTINATIONAL CORPORATIONS AND THEIR SUBSIDIARIES

2.1 Introduction

This chapter will outline the international business literature with a specific focus on the multinational corporation and subsidiary context in which innovations are generated and implemented. The chapter begins with a discussion of key perspectives on the MNC outlining a development over the last number of decades to a more ‘heterarchical’ view. Subsequently, subsidiary roles and their evolution are considered. The process of innovation in subsidiaries will then be described, including the influences that exist particularly on innovation in subsidiaries. Next, the concept of subsidiary initiative will be introduced. Then the control modes that the MNC may use will be discussed, presenting a case for the use of organisational culture as a means of control. Finally, the concept of entrepreneurial culture in MNCs will be discussed with the intention of linking the next literature chapter.

2.2 Multinational Corporations

Multinational corporations have been the subject of much research. Multinational corporations (MNCs) have been defined in a number of different ways, such as a cluster of

corporations of diverse nationality joined together by ties of common ownership (Perlmutter, 1969) or a firm with value-added activities in at least two countries (Rugman & Verbeke, 2001).

While multinationals have been categorised in a number of different ways, Perlmutter's (1969) distinction between ethnocentric, polycentric, and geocentric organisations is still widely used today. An ethnocentric organisation deals with complex tasks in the home country and transfers simple tasks to its subsidiaries. In this type of organisation, decision-making largely takes place in the headquarters and a high volume of information is then transferred down to the subsidiaries. In an ethnocentric organisation, subsidiaries only have a low level of autonomy. In contrast, organisations that follow a polycentric pattern strongly identify with the host country they operate in. This type of organisation operates on the basis of highly localised standards for performance with a relatively low level of authority and decision-making in the headquarters. Subsidiaries, therefore, have a higher level of autonomy. The third pattern, the geocentric organisation describes a truly international company that, however, still identifies with local interests. Decision-making aims to follow a collaborative approach between headquarters and subsidiaries. The goal is to establish universal standards that still allow for local variations. In contrast to both the ethnocentric and polycentric approaches, in an organisation with a geocentric approach communication between the subsidiaries is encouraged. In a geocentric organisation, subsidiaries experience a low to medium level of autonomy.

Prahalad and Doz's (1981) 'integration-responsiveness' framework has been proposed based on the dual forces of global integration and local responsiveness that MNCs experience. Global integration refers to the integration of the international activities of the MNC across all of its countries of operation with an aim of looking for the strengths of the MNC as a whole and achieving synergy effects. Local responsiveness describes the need for local subsidiaries to adapt to local conditions in host countries. Drawing on the 'integration-responsiveness' framework, Bartlett (1986) distinguishes between three different types of multinational corporations based on the differing strengths of the two forces. These are the global, the multinational, and the transnational corporation. An international corporation is later added in subsequent studies (Bartlett & Ghoshal, 1987, 1989). A global organisation is centralised and globally scaled. The subsidiaries are tasked with implementing the parent company's strategies, while knowledge is developed and retained at headquarters. A multinational organisation, then, is decentralised and its different national operations are self-sufficient. The subsidiaries take on a more important

role, compared to the global and international firm, as they sense and exploit local opportunities. In this type of organisation, knowledge is developed and retained within each unit. The transnational organisation, on the other hand, refers to a dispersed configuration, in which the headquarters and the subsidiaries operate in an interdependent fashion with specialised functions. Efficiency is considered the way to achieve global competitiveness. In order to integrate worldwide operations, the different national organisations make differentiated contributions. So, local responsiveness is seen as a means to ensure flexibility in international operations. Furthermore, headquarters and subsidiaries jointly develop knowledge and share it worldwide. In the transnational organisation, innovation is viewed as an outcome of a larger process of organisational learning that includes every member of the organisation. In an international organisation, the sources of core competencies are centralised while others are decentralised. Subsidiaries adapt and leverage the parent company's competencies. In this type of organisation, knowledge is developed at headquarters and then transferred to the subsidiaries. In a later paper, Ghoshal and Bartlett (1990) posit that multinational corporations are generally better conceptualised as an interorganisational grouping than a unitary organisation. In this view, the headquarters of the multinational corporation represents its strategic apex. It holds the ultimate responsibility for strategic direction, decision-making, and overall coordination (Ghoshal, Korine, & Szulanski, 1994).

Other important contributions to the international business literature, that reflect the critical role played by many subsidiaries in their organisation's competitiveness, were the heterarchy (Hedlund, 1986) and the metanational (Doz, Santos, & Williamson, 2001).

Heterarchy refers to organising a multinational corporation in order to strategically seek competitive "advantages originating in the global spread of the firm" (Hedlund, 1986, p. 20). In a heterarchical MNC strategy is determined by structure. The heterarchical MNC first defines its structural properties and then looks for strategic options that best suit these properties. Contrary to the earlier belief that competitive advantage resides in just one of the countries that the MNC operates in, the heterarchical MNC has many centres and the foundations of its competitive advantage can be found in many different countries. In a heterarchical MNC subsidiary managers are given a strategic role not only for their local subsidiary but for the MNC as a whole. Integration across the heterarchical MNC is achieved primarily through normative control (e.g. organisational culture).

introduced the concept of the metanational to the MNC literature. Contrary to the heterarchical or transnational organisation, the metanational does not derive its competitive

advantage from the headquarters or national subsidiaries. Instead, the metanational identifies and captures new knowledge emerging all over the world before translating this knowledge into innovative products and new market opportunities. Then this innovation is turned into value by producing, marketing, and delivering efficiently on a global scale.

These contributions to research on multinational corporations resulted in a growing recognition that subsidiaries are not merely subordinate elements of their parent corporations. In turn, this recognition resulted in a shift in awareness away from the assumption that firm-specific advantages originate in the parent company of the MNC to a view that subsidiaries play an important part in the creation and maintenance of those firm-specific advantages (Birkinshaw et al., 1998). This increase in the strategic importance of subsidiaries has resulted in a decreased dependence of subsidiaries on the parent company and an increase in the level of strategic choice that they experience (Ambos & Birkinshaw, 2010). Generally, subsidiaries are now recognised as internally differentiated and goal-disparate units with their own individual stakeholder networks (Kostova, Marano, & Tallman, 2016). The MNC of the 21st century can be described as a multi-hub organisation (Mudambi, 2011). In order to understand the different elements of this interorganisational grouping, it is now necessary to provide a description of subsidiaries and a discussion of their changing role in the multinational corporation.

2.3 Perspectives on the MNC Subsidiary

A subsidiary of a multinational corporation can be defined as “any operational unit controlled by the MNE and situated outside the home country” (Birkinshaw, 1997, p. 207), “which can perform a single activity or an entire value chain of activities” (Birkinshaw & Hood, 1998, p. 774).

The MNC subsidiary literature has undergone somewhat of a shift from early writing focused on the MNC, or the MNC-subsidiary relationship, to a focus on the MNC subsidiary as such today (Birkinshaw & Pedersen, 2009). Most of the early research assumed that ownership-specific advantages were developed at the corporate headquarters and leveraged overseas through the transfer of technology to a network of foreign subsidiaries. The early analysis of the parent-subsidiary relationship was considered from a traditional hierarchical perspective and therefore centred on aspects such as centralisation, formalisation, coordination, and control (Brandt & Hulbert, 1977; Cray, 1984; Hedlund, 1981; Negandhi & Baliga, 1981; Picard, 1980). Thus, headquarters were viewed as the sole source of capability within the MNC (Birkinshaw & Hood, 1998; Birkinshaw et al., 1998).

Four research streams exist in the early literature from the 1960s to the 1990s (Birkinshaw & Pedersen, 2009). Firstly, the strategy-structure stream focused on the strategy and structure of the MNC from a traditional hierarchical perspective. The main concern here was to understand the rationale behind the MNC's adoption of certain structures, with structure being viewed as something that would change to fit strategy. Strategy itself was developed at corporate headquarters and subsidiaries were given very little explicit attention. Secondly, the HQ-subsubsidiary relationship stream was mainly concerned with how corporate headquarters could control its subsidiaries. Common themes included the centralisation and decentralisation of decision-making, approaches to coordination, and integration across the grouping of subsidiaries. Thirdly, the MNC process stream focused on issues such as strategic decision-making and organisational change in MNCs. This stream of research acknowledged the fact that the reality of the relationship between the parent company and its subsidiaries was more complex than purely hierarchical. However, the MNC as a whole was still the main focus of the studies that formed part of this research stream, not the subsidiary. The fourth research stream, the subsidiary role stream, built on the MNC process stream by moving the level of analysis down from the firm level to that of the subsidiary. Following Ghoshal's (1986) seminal work on innovation processes, a number of studies were published which focused on understanding the different roles that subsidiaries can play in the MNC. This stream of research acknowledges that the subsidiary is not just an instrument of the parent but has a certain degree of freedom in shaping its own role.

Starting from the 1990s, as subsidiaries grew, researchers increasingly came to acknowledge that corporate headquarters were no longer the only source of competitive advantage (Birkinshaw & Hood, 1998). The research gradually came to include a stronger focus on subsidiaries and their importance to overall MNC performance (Kostova et al., 2016). One could argue that this development may have been brought on by an increasing complexity of global operations.

Another stream in more recent literature focuses on information flows between the subsidiary and its network. The network of the subsidiary may be either inside – between the subsidiary and HQ (e.g. Gupta & Govindarajan, 1991, 2000) – or outside of the MNC – between the subsidiary and its local business environment (e.g. Cantwell & Mudambi, 2005; Phene & Almeida, 2003). This stream of literature is mainly concerned with the interaction between the internal and the external network of the subsidiary. A strong external network alone does not provide a subsidiary with more strategic influence in the

MNC. A subsidiary can obtain a stronger position in the MNC if it can turn strong external network relations into superior knowledge that is of importance for other units of the MNC.

A recent stream of research concentrates on the headquarters-subsidary relationship. While this is not a new research stream as such, some new approaches have been introduced to the literature in recent years. These include the application of the concept of procedural justice to the HQ-subsidary relationship (e.g. Taggart, 1997), feedback-seeking behaviour by subsidiary managers (Gupta, Govindarajan, & Malhotra, 1999) and perception gaps between HQ and subsidiary managers (Birkinshaw, Holm, Thilenius, & Arvidsson, 2000).

Two further streams of MNC subsidiary literature which flourished during the 1980s and 1990s have been the subsidiary role literature and a research stream with a focus on the evolution of subsidiary roles. Both of these research streams will now be considered in more depth.

2.4 Subsidiary Roles

The role of the subsidiary is defined as “a negotiated position that is to some degree understood jointly between headquarters and subsidiary managers” (Birkinshaw et al., 2000, p. 324). The subsidiary role literature stream focuses on the specialisation of roles taken by subsidiaries in the MNC (Birkinshaw & Pedersen, 2009). The differences between subsidiaries based on their scope of operations, the extent of their responsibilities, the importance of the markets they serve and their level of competence have resulted in a number of subsidiary role typologies.

Perlmutter’s (1969) distinction between different orientations of the multinational corporation – as discussed above in section 2.2 – outlines different strategic roles of subsidiaries. As this framework is still widely used today, the different strategic roles of subsidiaries in an ethnocentric, polycentric, or geocentric organisations will briefly be discussed. Firstly, in an ethnocentric multinational corporation, the subsidiary’s role is operational, rather than strategic. Its main role is to simply implement the local strategy. Secondly, in a polycentric multinational, subsidiaries are operationally independent and increasingly take strategic decisions with regard to their operations in their local market. So, not only do they implement the local strategy, but they also formulate it. Thirdly, in geocentric multinationals, subsidiaries have to implement strategies formulated according

to a global logic on a local level and also have to respond quickly to competitive conditions. Thus, they operate on a global level.

In their seminal paper on foreign-owned subsidiaries, White and Poynter (1984) identified distinctive subsidiary roles including the miniature replica, rationalised manufacturer, product specialist, and strategic independent. A subsidiary that is a miniature replica produces and markets some of the parent company's product lines or related product lines in the host country. If a subsidiary takes on the role of a rationalised manufacturer it produces a designated set of components or products in the host country for sale in multiple countries or the global market. A product specialist subsidiary develops, produces, and markets a limited range of products for global markets. If a subsidiary takes on this role, exchanges between the subsidiary and the parent company are rare. A strategic independent subsidiary has the freedom and resources to develop lines of business for the local host country market, multiple countries, or the global market. In this case, the parent takes on the role of a passive investor with only administrative and financial links to the subsidiary.

Further drawing on the 'integration-responsiveness' framework (Prahalad & Doz, 1987) and its earlier developments (Bartlett, 1986; Bartlett & Ghoshal, 1986, 1987, 1989), Jarillo and Martinez (1990) propose a framework consisting of three different types of subsidiaries. The first type, the autonomous subsidiary, carries out most value chain activities while being largely independent of headquarters and other subsidiaries. This strategy is typical of subsidiaries of multinational firms (Bartlett, 1986). The second type, the receptive subsidiary, performs a few value chain activities and is highly integrated within the multinational. This subsidiary strategy is typical of subsidiaries of global firms operating in global industries. The third type, the active subsidiary, performs several value chain activities in the host country. These activities are carried out in close coordination with the rest of the organisation, meaning the active subsidiary operates as an active node in a tightly knit network. This strategy is usually followed by subsidiaries of transnational organisations (Bartlett & Ghoshal, 1987) with strong headquarters-assigned mandates. Not all subsidiaries of transnational organisations will follow an active strategy, only those that represent important nodes in the network.

Similarly, Gupta and Govindarajan (1991) defined four generic subsidiary roles. These are global innovator, integrated player, implementor, and local innovator. A global innovator is a subsidiary that serves as a source of knowledge for other units of the MNC. An integrated player transfers knowledge to other units of the organisation, but at the same

time also receives knowledge from other units. An implementor is heavily dependent on knowledge flows from other units or the headquarters of the MNC. This type of subsidiary only creates a little amount of knowledge on its own. The local innovator is a self-standing subsidiary that independently creates knowledge without receiving knowledge flows from any of the other units.

Roth and Morrison (1992) focused on the configuration and coordination of activities and identified two potential subsidiary strategies: a global subsidiary mandate and an integrated subsidiary. An integrated subsidiary is primarily tasked with the implementation of a headquarters-developed strategy, whereas a subsidiary with a global subsidiary mandate is responsible for all of the value chain activities on a global basis for a product or product line. A subsidiary with a global subsidiary mandate shows similarities with Gupta and Govindarajan's global innovator and integrated player types. The integrated subsidiary can be compared to the implementor type.

Ghoshal and Bartlett (1988), in their study of creation, adoption, and diffusion of innovation, described three different types of subsidiaries. Some subsidiaries create innovations but would not adopt or diffuse any, which shows similarities to the local innovator in Gupta and Govindarajan's typology. Others would create, adopt, and diffuse innovations, which can be compared to Gupta and Govindarajan's integrated player type. The third type would create and adopt innovations but not diffuse them. There is no equivalent to this third type in Gupta and Govindarajan's typology.

Birkinshaw and Morrison (1995) also proposed a typology that outlines three different subsidiary roles. Their typology identifies the roles of the local implementer, the specialised contributor and the world mandate. Firstly, the local implementer encompasses the characteristics of the local innovator and the implementor from Gupta and Govindarajan's typology as well as those from Bartlett and Ghoshal's implementer. This means that this type of subsidiary has a limited geographic scope and a severely constrained product or value-added scope. It also usually has a rather limited functional scope. Secondly, the specialised contributor is similar to Gupta and Govindarajan's global innovator and Bartlett and Ghoshal's contributor. This type of subsidiary has considerable expertise in certain functions or activities and its activities are tightly coordinated with the activities of other subsidiaries. Thirdly, Birkinshaw and Morrison identify the world mandate. Here, a subsidiary has a global or regional responsibility for a product line or an entire business. This third type of subsidiary is comparable to Bartlett and Ghoshal's strategic leader and Gupta and Govindarajan's integrated player.

More recent contributions to this stream of literature have been made by Ambos and Reitsperger (2004) and Cantwell and Mudambi (2005). Ambos and Reitsperger (2004) distinguish between subsidiaries based on two dimensions: technological mandate (capability-augmenting or capability-exploiting) and task interdependence (tasks delivered to and received from other units). They present a distinction between four strategic mandates: local adaptor (low interdependence, capability exploiting), integrated research unit (high interdependence, capability augmenting), global development unit (high interdependence, capability exploiting) and centre of excellence (low interdependence, capability augmenting). The local adaptor and the integrated research unit can be compared to Gupta and Govindarajan's local innovator and integrated player, respectively. While there is no exact match for the global development unit and centre of excellence in Gupta and Govindarajan's typology, they are most similar to the implementor and global innovator, respectively. Similarly, Cantwell and Mudambi (2005) distinguish between competence-creating and competence-exploiting subsidiaries. A competence-exploiting subsidiary adapts competencies that are familiar to the MNC group and the parent company, whereas a competence-creating subsidiary introduces capabilities that are new to their respective corporate units.

Table 2.1: Comparison of Subsidiary Typologies based on Gupta and Govindarajan's Typology

Gupta & Govindarajan (1991, 1994)	Global Innovator	Integrated Player	Implementor	Local Innovator	Other
White & Poynter (1984)	Rationalised Manufacturer, Product Specialist	World Mandate			
Bartlett & Ghoshal (1986)	Contributor	Strategic Leader	Implementer		Black Hole
Ghoshal & Bartlett (1988)		Creation Adoption Diffusion		Creation No adoption No diffusion	Creation Adoption No diffusion
Jarillo & Martinez (1990)	Receptive	Active		Autonomous	
Roth & Morrison (1992)	Global Subsidiary	Mandate	Integrated		
Birkinshaw & Morrison (1995)	Specialised Contributor	World Mandate		Local Implementer	
Ambos & Reitsperger (2004)	Centre of Excellence	Integrated Research Unit	Global Development Unit	Local Adaptor	
Cantwell & Mudambi (2005)	Competence-Creating		Competence-Exploiting	Competence-Creating	

As can be seen from the above discussion and the comparison presented in Table 2.1, there is some overlap between the different subsidiary typologies. In today's business environment, many MNC subsidiaries perform specific value-creating activities. In doing so, they can perform a number of different activities and not just one as suggested in earlier research. Rugman and Verbeke (2001) propose that attempts to classify subsidiaries based on their specific role in the multinational corporation have become less relevant. They outline ten different patterns of competence building in subsidiaries, in which they describe the creation of firm-specific advantages (FSAs). They further distinguish between location-bound FSAs and non-location-bound FSAs, and their subsequent diffusion to the MNC. This highlights a clear trend within MNCs towards a greater differentiation of the strategic roles that are assigned to individual subsidiaries. Subsidiary roles can be assigned by headquarters (Bartlett & Ghoshal, 1989; Prahalad & Doz, 1981), assumed through subsidiary initiative (Birkinshaw, 1997), or be determined by environmental influence

(Ghoshal & Nohria, 1989). A subsidiary role is not a static construct but can develop over time. The next section considers the evolution of subsidiary roles.

2.5 Evolution of Subsidiary Roles

A research stream in more recent literature concentrates on the evolution of subsidiary roles. Subsidiary evolution can be defined as the accumulation or depletion of resources and/or capabilities in subsidiaries over time (Filippov & Duysters, 2014). Subsidiaries generally start out with market-seeking responsibilities but then develop resources and capabilities on their own. Subsidiary evolution can either be driven from within – through the initiative of subsidiary managers – or from outside – through external forces. There are three contrasting perspectives in the MNC subsidiary literature regarding the determinants of subsidiary evolution (Birkinshaw & Hood, 1998; Birkinshaw et al., 1998). These are determinism of the local environment, head-office assignment of roles, and subsidiary choice. Firstly, environmental determinism defines the role of a subsidiary as a function of its local environment. In this case, the importance of the role played by the subsidiary is highly correlated with the strategic importance of its local environment. Secondly, head-office assignment of roles refers to a situation in which the headquarters of the MNC holds the responsibility for defining the strategy for the whole corporation. In this instance, the assumption is made that headquarters knows best how roles should be assigned to subsidiaries so that corporation-wide strategic imperatives are met. Traditionally, this determinant has been vital in understanding how subsidiaries function and perform. A headquarter assignment is also referred to as a “mandate” (Birkinshaw, 1996). Thirdly, subsidiary choice describes the instance in which subsidiary management largely define for themselves the role that the subsidiary plays. This third factor has garnered more attention in recent literature as a determinant of subsidiary evolution (e.g. Birkinshaw et al., 2005; Delany, 2000). In reality, subsidiaries are likely to experience a combination of internal and external forces. External forces would largely shape the options that the subsidiary has, whereas it depends on the subsidiary manager to take initiative and respond to those options (Birkinshaw & Pedersen, 2009). In many cases, there tends to be a degree of resistance from headquarters regarding initiatives coming from a subsidiary and therefore there is an intrinsic tendency for inertia (Filippov & Duysters, 2014). The concept of subsidiary initiative will be discussed in further detail in a subsequent section of this chapter.

These sections have described different subsidiary typologies and reviewed subsidiary evolution. It is assumed that as the subsidiary develops, it can take on higher-level value

chain activities and play a more active role in the MNC's innovation process. The next part of this chapter will consider the main arguments for and influences on innovation in multinational subsidiaries.

2.6 Innovation in Subsidiaries

In early studies of innovation in multinational corporations and their subsidiaries, it was assumed that the parent company was the source of innovation and innovations were consequently diffused to the subsidiaries. This assumption underpins the product life cycle hypothesis (Vernon, 1966). More recent research suggests that subsidiaries play an increasingly important role in innovation. Due to an increased pressure to innovate, the MNC is increasingly dependent on its subsidiaries, where much of the innovative capabilities reside (Lind & Kang, 2011). In their study of innovation in subsidiaries of multinational corporations, Ghoshal and Bartlett (1988) outlined three different roles a subsidiary can take on during the innovation process. Subsidiaries can 1) create innovation, 2) adopt innovation or 3) diffuse their local innovations to the multinational corporation. In order to create innovations, subsidiaries can develop products or processes locally using local resources and responding to local conditions and circumstances. When adopting innovations, subsidiaries may be required to adopt innovations developed by the parent company or at a central research facility. Subsidiaries may also be required to diffuse innovations that they have developed at a local level to the parent company or to the multinational corporation as a whole. This role typology describes the now very popular view of the MNC as that of a globally integrated innovation network (Bartlett & Ghoshal, 1989). If a subsidiary is actively involved in the innovation process, the MNC can leverage these innovations on a global basis, which can serve to enhance the global competitiveness of the firm (Keupp & Gassmann, 2009a; Venaik, Midgley, & Zeitlin, 2005). Innovative subsidiaries then become a potentially important source of competitive advantage for the MNC (Frost, 2001).

2.6.1 Influences on Innovation in Subsidiaries

Innovation in subsidiaries is contingent on a number of factors. For subsidiaries to engage in innovation in the first place, it needs to be feasible and desirable (Ghoshal & Bartlett, 1988). Feasibility depends on the availability of local resources as well as the level of autonomy the subsidiary experiences, whereas desirability can be expressed through normative integration facilitated by a global organisational culture shared across the MNC. Other factors depend on the strategy a subsidiary follows (Frost, 2001). If it focuses on

exploiting existing knowledge within the MNC, then its innovative output is largely reliant on home country sources. If on the other hand, it focuses on exploring new knowledge then its innovative output depends on host country sources. The size of the subsidiary also has an impact on where it gathers the knowledge necessary for innovation. Smaller subsidiaries often rely on home country sources, whereas larger subsidiaries tend to leverage host country sources (Frost, 2001). Frost (2001) further identifies the technical presence of the parent firm in the host country as an influence on subsidiary innovation. Here, technical presence was operationalised as the total number of patents issued to all subsidiaries in the host country. In cases where the parent firm only has a small presence in the host country, the subsidiary relies on home country sources for innovation. If the parent firm has a larger presence in the host country, the subsidiary uses the local host country sources. The technological richness of the MNC, defined as the number of patents successfully applied for by the MNC as a percentage of total worldwide patents, can also affect the innovative output of the subsidiary (Almeida & Phene, 2004). This may be because subsidiaries in more innovative MNCs benefit from underlying organisational systems and processes that permit the entire organisation to engage in innovation.

Autonomy, normative integration, and communication have been found to be important values with regard to innovation in subsidiaries (Ghoshal & Bartlett, 1988). Specifically, autonomy, local resources, normative integration, and communication are positively associated with the creation of innovation in the subsidiary. The importance of high normative integration to innovation in subsidiaries (Ghoshal & Bartlett, 1988; Nohria & Ghoshal, 1994) again points to the importance of an overarching organisational culture in guiding the behaviour of the subsidiaries. Interestingly, studies over the last two decades found that MNCs rarely use their network of foreign subsidiaries to generate innovations on a global basis or leverage subsidiary innovations (Keupp & Gassmann, 2009a). This could be an indication of global integration being a deciding factor in realising an MNC's full innovation potential.

There are a number of differing views in the literature about how innovation processes within MNC subsidiaries should be managed (Lind & Kang, 2011). One stream of research focuses on the role of headquarters in subsidiary innovation (e.g. Bartlett & Ghoshal, 1989). Headquarters are able to influence innovation processes at the subsidiary level through the use of different control and incentive systems as well as resource allocation procedures (Ambos & Schlegelmilch, 2007). A common reason for headquarters to actively involve themselves is to ensure that the projects it supports are profitable for the

MNC as a whole, not only the subsidiary. In this case, the headquarters assume a value-enhancing integrative role. As subsidiaries may lack an overview of the business needs of other units, the headquarters' role is to coordinate the MNC activities across the subsidiaries (Lind & Kang, 2011). Another stream of research takes the view that headquarters involvement can lead to the destruction of value due to increased overhead costs, slower decision-making and the possibility of making ill-judged interventions (Goold & Campbell, 2002). Headquarters involvement in the subsidiary activities may eventually turn into somewhat of a formal process control, which can result in decreased creativity, a high level of bureaucracy, and decreased innovativeness (Amabile, 1998). More recent research has addressed how important the encouragement of entrepreneurial processes in the subsidiaries is (Young & Tavares, 2004). Subsidiaries that undertake entrepreneurial activities perform relatively better than those that show no entrepreneurial tendencies (Ambos & Birkinshaw, 2010). The next section provides a synopsis of subsidiary entrepreneurship research, with a focus on the key concepts of subsidiary initiative and subsidiary autonomy.

2.7 Subsidiary Initiative

Whereas it has been recognised that multinational corporations' ability to leverage distinct competencies of internationally dispersed subsidiaries can be a source of competitive advantage, the concept of subsidiary entrepreneurship has largely been neglected in the literature (Boojihawon et al., 2007; Rugman & Verbeke, 2001). Subsidiary entrepreneurship in this context refers to competencies that could contribute to both subsidiary- and MNC-level development (Dimitratos, Liouka, & Young, 2014). The subsidiary entrepreneurship literature focuses on the importance of the strategic freedom of subsidiary managers. A key manifestation of subsidiary entrepreneurship is subsidiary initiative (Lind & Kang, 2011).

Birkinshaw and others (Ambos, Andersson, & Birkinshaw, 2010; Birkinshaw, 1997; Birkinshaw et al., 1998) present insights into the subsidiary entrepreneurship construct through their work on subsidiary initiative. They find that subsidiary initiative is promoted by high levels of distinctive subsidiary competencies and suppressed by high levels of decision centralisation (Dimitratos et al., 2014). Subsidiary initiative has briefly been discussed earlier in this chapter as one of three determinants of subsidiary evolution. Subsidiary initiatives can be defined as "proactive, autonomous and risk-taking activities that originate outside the home country in a foreign subsidiary of an MNC and are initiated by actors in the subsidiary" (Schmid, Dzedek, & Lehrer, 2014, p. 201). Similarly,

Birkinshaw and Ridderstråle describe subsidiary initiative as a type of 'dispersed entrepreneurship' (Williams & Lee, 2009), defining subsidiary initiatives as "entrepreneurial activities carried out by foreign owned subsidiaries in MNCs" (Birkinshaw & Ridderstråle, 1999, p. 149). An initiative refers to a "discrete, proactive undertaking that advances a new way for the corporation to use or expand its resources" (Birkinshaw & Ridderstråle, 1999, p. 151). Subsidiary initiatives may not only consist of radical innovations but also incremental innovations (Dimitratos, Liouka, Ross, & Young, 2009; Schmid et al., 2014). While the term subsidiary initiative may sound as if the initiative itself would only be of interest to the subsidiary, this is not the case. Subsidiary initiatives have an effect on the rest of the MNC as they are usually pursued with the objective of changing the charter of the subsidiary (Birkinshaw & Ridderstråle, 1999). In this context, charter refers to the "business or elements of a business in which the subsidiary participates and for which it has responsibility" (Galunic & Eisenhardt, 1996 in Birkinshaw & Ridderstråle, 1999). A subsidiary initiative may also be beneficial to an internal customer in the MNC, such as another subsidiary.

Birkinshaw & Ridderstråle (1999) found that subsidiary initiatives come in two different forms; firstly, as internally-focused initiatives and, secondly, as externally-focused initiatives. Internally-focused initiatives are based on opportunities that are identified within the organisation. These initiatives are usually brought forward through a traditional bottom-up process. Externally focused initiatives are based on opportunities in the external market. The biggest difference here is that the most successful of these types of initiatives tend to get support from outside the organisation at an early stage of the initiative process and only meet with resistance at a later stage when they are rather well established. Furthermore, Birkinshaw (1998) differentiated between four different types of internal initiatives: bid initiatives, leap of faith initiatives, reconfiguration initiatives, and maverick initiatives.

In their review of the literature, Schmid et al. (2014) argue that the understanding of the concept of subsidiary initiative tends to be much more internally focused – on changes within the MNC – instead of externally focused – on external markets of the MNC. This means that the discussion of subsidiary initiative in the literature is more focused on organisational entrepreneurship than market entrepreneurship (see also Birkinshaw, 1997).

2.7.1 Resistance to Subsidiary Initiatives

Even though subsidiary initiative is an important aspect with regard to innovation in subsidiaries and thereby the MNC, Birkinshaw and Ridderstråle (1999) argue that subsidiary initiatives are rare for a number of reasons. Firstly, subsidiaries are generally tasked with activities of exploitation, more so than activities of exploration or creation. This might be because creation-oriented activities can threaten existing power bases in the organisation as well as challenge existing routines and procedures. Another reason is that subsidiaries are generally lower in power. This means that they have a limited degree of freedom with regard to enacting change. Also, there is generally a low degree of visibility of subsidiary initiatives in the parent company. The established structure of the organisation tends to favour ideas that were developed in "high-influence parts of the organisation at the expense of those from the periphery" (Burgelman & Grove, 1996; Hamel, 1996).

A number of studies suggest that subsidiary initiatives face substantial forms of resistance and uncertainties. It has been suggested that autonomy, while generally regarded as positive, can have negative effects. Subsidiary autonomy differs from autonomy in a more general sense because of subsidiaries' status as affiliates instead of independent firms (Dimitratos et al., 2009). Because of their status subsidiaries are subject to the ultimate control of their parent company. Relationships with the parent company and other subsidiaries in the MNC network create opportunities but also present challenges in developing entrepreneurial competencies for the subsidiary. Ambos et al. (2010) argue that subsidiary initiatives per se can have a direct impact on subsidiary autonomy. Headquarters tends to view subsidiaries' initiative-taking with ambivalence as it seeks to ensure that it remains in control and alert to any risks the subsidiary may take. This increased level of control and monitoring that is exercised by headquarters may, therefore, lead to a reduction in overall subsidiary autonomy. Whether the relationship between subsidiary initiatives and subsidiary autonomy is positive or negative may depend on a number of different factors, such as subsidiary market size, the subsidiary's strategic importance to the MNC, MNC integration as well as institutional differences between developing and developed countries (Raziq, Borini, & Perry, 2014).

Because subsidiary initiatives can be perceived as highly disturbing of the MNC's organisational equilibrium, they might cause a degree of corporate resistance to the initiatives (Birkinshaw & Ridderstråle, 1999). In a process study of subsidiary initiatives, Birkinshaw and Ridderstråle (1999) found that resistance to subsidiary initiatives may not

only stem from the parent company but also from other subsidiaries as well as other business units within the subsidiary. This resistance can manifest in a number of different ways. The parent company may delay or reject the subsidiary initiative, competing subsidiaries may lobby or launch rival initiatives, or the subsidiary initiative may lack legitimacy in other MNC units (Schmid et al., 2014). To describe this internal resistance within the MNC, Birkinshaw and Ridderstråle (1999) coined the term "corporate immune system". The corporate immune system is defined as a "set of organisational forces that suppress the advancement of creation-oriented activities such as initiatives" (Birkinshaw & Ridderstråle, 1999, p. 153). To illustrate the resistance that subsidiary initiatives face, a subsidiary initiative is likened to "an alien body that the corporate immune system seeks to destroy" (Birkinshaw & Ridderstråle, 1999, p. 150). The corporate immune system has also been described to "kill off intruding initiatives for the fear that they might infect the rest of the organism" (Birkinshaw & Fry, 1998, p. 52). The more a subsidiary is integrated into the MNC innovation system, the lower is its creativity and focus on truly new products and competencies (Mudambi, 2011). This is because these truly new products and competencies may not fit with the MNC's existing portfolio. Therefore, they may threaten to cannibalise existing revenue streams. Consequently, the development and implementation of these innovations may be stopped by the corporate immune system.

This resistance against subsidiary initiatives may also exist in the MNC as a way of protecting against behaviour that is not in line with corporate objectives. In a situation in which the subsidiary simply adapts and leverages the parent company's competencies, local innovations may be undertaken by the subsidiary out of an interest to protect its turf and/or autonomy or may be reinventions of the wheel that are caused by inefficient communication (Bartlett & Ghoshal, 1989). Similarly, initiatives by subsidiaries to further develop the role that they play in the MNC can be seen as subversive (Birkinshaw et al., 1998). Birkinshaw and Hood (1998) introduced the term "empire building" to describe self-serving behaviour by the subsidiary. This relates to behaviour by subsidiary management to develop the subsidiary for the benefit of the host country or for their own benefit. The actions that the subsidiary undertakes, in this case, are not aligned with the overall strategic priorities of the MNC. In earlier research, Prahalad and Doz (1987) also warned of the dangers that "autonomous barons" within the diversified MNC pose to the regular evolution of corporate strategy. While resistance may be an appropriate response to subsidiary initiatives, it may have unintended consequences. With decisions being based on existing corporate processes and management's own informal processes, errors might be made in the selection of initiatives. If promising subsidiary initiatives are rejected in

error, this may over time suppress creation-oriented activities that challenge existing power bases (Birkinshaw & Fry, 1998; Birkinshaw & Ridderstråle, 1999). Ethnocentrism, suspicion and resistance to change may manifest in undesirable behaviours, such as rejections, delays or competition from other parts of the MNC.

Subsidiary initiatives may be met with a significant degree of resistance. However, the nature of a subsidiary initiative might play a role in how it is received. As previously discussed, subsidiary initiatives may not only result in radical innovations but also in incremental innovations (Dimitratos et al., 2009). The scope of innovation that a subsidiary seeks to implement seems to have an impact on how it is received within the MNC. In their review of the subsidiary initiative literature, Schmid et al. (2014) note that local-for-global innovations by MNC subsidiaries are more likely to awaken the corporate immune system than local-for-local innovations do (Ghoshal & Bartlett, 1991). However, both of these types of innovations would still require less organisational entrepreneurship than what Schmid et al. refer to as global-internal initiatives (Schmid et al., 2014). These types of initiatives are discussed by Birkinshaw in the subsidiary initiative literature. They refer to new business initiatives which would result in a change of the subsidiary's status due to an augmented role in the MNC. Another, more positive, reaction to subsidiary initiatives is headquarters attention.

2.7.2 Headquarters Attention

The concept of headquarters attention is also related to the concept of corporate resistance. Ambos and Birkinshaw (2010) conceptualise headquarters attention as “the extent to which the parent company recognizes and gives credit to the subsidiary for its contribution to the MNC as a whole” (Bouquet & Birkinshaw, 2008). Headquarters and subsidiaries may have different views on how attention should be allocated. Headquarters might either want to support subsidiaries, transfer knowledge, ensure coordination or strengthen their control and limit disruptive behaviour. Subsidiaries may, however, try to acquire resources, augment their mandate, increase their power base, or try to avoid intervention. Generally, subsidiaries are likely to try and augment their role in the MNC in order to enhance their performance. In their study of headquarters attention and subsidiary performance, Ambos and Birkinshaw (2010) found that subsidiaries with a high level of strategic choice and a high level of headquarters attention perform better than their peers. This finding may lead to the conclusion that headquarters attention as conceptualised in this study does indeed have a positive impact on subsidiary performance. The positive view of subsidiary contribution as seen in the construct of headquarters attention is in stark difference to the

concept of the corporate immune system that tries to protect the existing fabric of the MNC against new subsidiary initiatives. This highlights the challenge that parent companies may experience when deciding how they should manage subsidiary initiatives. The strict control of subsidiaries' actions that the corporate immune system implies may not be necessary if a strong set of globally shared values exist in the MNC.

2.8 Recent Developments

As discussed above, until recently it was assumed that subsidiaries grow in their role as contributors to the innovation process of the MNC. This assumed relationship between parent companies and their subsidiaries may have changed. Keupp and Gassmann (2009b) suggest that there are some hidden factors that oppose the successful implementation of a transnational approach to innovation. Based on a review of the literature, they propose that factors such as intra-organisational power structures, inter-unit rivalry, organisational inertia, problems with intrafirm knowledge transfer, and the irrationality of human behaviour have an impact on the implementation of a transnational strategy. An organisation's subsidiaries can influence the organisation's strategy (Keupp & Gassmann, 2009b), which is in stark contrast to the central assumption at the core of the transnational paradigm, namely that the subsidiaries' tasks are solely planned centrally. The six factors listed above give an insight into how a subsidiary could negatively impact a centrally planned strategy and highlights the need for global integration and congruence, which could be facilitated by means of an overarching organisational culture. Similarly, Reilly and Sharkey Scott (2013) argue that many subsidiaries now adopt a more narrowly defined, specialised implementer role, while also experiencing greater levels of monitoring and control from the parent company. Advances in ICT have made monitoring and control of foreign operations much easier for the parent company. The ability to frequently monitor subsidiary activities may in itself encourage tighter control (Scott & Gibbons, 2011). This tendency towards an increasing level of control over the subsidiary seems to limit the potential of experimentation and initiative taking at the subsidiary level. There are two ways in which the subsidiary's ability to act in response to local opportunities may be reduced. First, the subsidiary's freedom to act on opportunities without first obtaining headquarters' permission could be reduced. Second, the increased monitoring by headquarters may reduce the level of slack or unused available resources in the subsidiary system. This combination of decreased autonomy and decreased slack may mean that both the subsidiary's decision-making ability and its resources to execute them are decreased (Scott & Gibbons, 2011).

Decreased autonomy might not only result from subsidiary initiative, it may also be affected by the structural organisation of the multinational corporation. Multinationals now have the option to allocate strands of activities from across the value chain to subsidiaries. A subsidiary in a particular location may no longer necessarily be a national subsidiary but an amalgamation of a number of different value chain activities. This view is shared by Birkinshaw and Pedersen (2009) who note that most MNCs have now moved towards some variant of the global business unit structure. This means that in most developed countries, the national subsidiary no longer exists. Instead, a series of discrete value-adding activities which report through their own business units are assigned to the subsidiary. Scott and Gibbons (2011) argue that this slicing of value-adding activities, assigned to the subsidiary, closely monitored and with little autonomy, substantially reduces the subsidiary's ability to adopt a strategic perspective and to identify how its operation fits within the organisation. This, in turn, reduces the potential for subsidiary initiative as the subsidiary's role will be limited to achieving its value-adding activities efficiently and effectively. It could be argued that disaggregated knowledge only has a limited value and therefore presents a challenge to subsidiaries' capacity to generate initiatives in the first place (Reilly, Scott, & Mangematin, 2012). The resulting internal environment of the MNC could be described as competitive rather than collaborative. Power plays in the MNC could mean that the parent company chooses to become less reliant on the knowledge, ideas, and insights generated at the subsidiary level (Reilly et al., 2012). The focus shifts from one of exploring new opportunities to one of realising short-term certainties. Without a dedicated mandate for innovation from the parent company, the subsidiary is left with little scope for innovation. Mudambi (2011) describes this phenomenon as the innovation integration dilemma: The more that headquarters exercises its right to monitor and control the subsidiary, the lower the level of innovation in the subsidiary. This presents headquarters with the challenge of monitoring and exercising control while allowing for entrepreneurial activities at the subsidiary level. One means of exercising control whilst communicating an appreciation of creation-oriented activities is organisational culture.

2.9 Organisational Culture

In the international business literature, the majority of writings view national culture as the main variable explaining the activities of organisations in foreign markets. The concept of culture in international business, therefore, appears to mainly refer to national culture. It does, however, actually present an amalgamation of organisational, societal, and national traits. When looking at the relationship between MNCs and their subsidiaries, the concept

of organisational culture is much discussed. Throughout the literature reviewed aspects of how the parent company of the multinational corporation controls its international subsidiaries have been observed. Some seminal contributions to the MNC literature (Hedlund, 1986; Prahalad & Doz, 1981) propose that formal structure was often less important than management systems or culture as a means of controlling subsidiary managers. While different modes of control have been discussed in the literature, as the field developed a move away from formal modes of control to more flexible cultural controls becomes apparent (e.g. Jaeger, 1983; Paterson & Brock, 2002; Williams & van Triest, 2009).

According to Ghoshal and Nohria (1989), the structure of each headquarters-subsidiary relationship in an MNC should be differentiated to fit its context. Shared values and common and closely aligned interests between the headquarters and the subsidiaries could be used to manage the relationship (Nohria & Ghoshal, 1994). Similarly, Hofstede (1994) proposes that multinationals should have a global organisational culture in order to facilitate cooperation across the globe. The use of shared values to govern subsidiaries does not equal to a complete disappearance of hierarchical or bureaucratic elements from the headquarters-subsidiary relationship (Nohria & Ghoshal, 1994). The emphasis simply shifts to the creation of shared values across the MNC instead of explicitly formal differentiated relationships with the different subsidiaries. This shared values approach allows for differences across the subsidiaries. Since institutional and cultural differences between countries persist, adaptations and some level of autonomy are required in local subsidiaries. At the same time, increasing interdependencies, cost pressures, and corporate standards require certain levels of control, coordination and conformity throughout the MNC (Brenner & Ambos, 2013). Headquarters must, therefore, consider a series of trade-offs when deciding on its control strategy. MNCs tend to introduce social controls first and other elements and combinations of controls thereafter (Brenner & Ambos, 2013). This sequence of introducing controls highlights the importance of organisational culture and shared values as a way of managing the headquarters-subsidiary relationship.

Another significant aspect of organisational culture is its manifestation in the subsidiary. While a global organisational culture can serve as a means of control, differences in the organisational culture are likely to arise in different national contexts (Denison, Haaland, & Goelzer, 2004). These differences emerge because subsidiaries simultaneously operate in two different contexts. Firstly, they are a part of a multinational corporation that has the capacity to share knowledge across all of its units. Secondly, subsidiaries are a part of the

host country context with its social, professional, and technological relationships between local firms. This ‘multiple embeddedness’ brings with it its own unique challenges and opportunities (Andersson, Forsgren, & Holm, 2001; Meyer, Mudambi, & Narula, 2011). The culture resulting from these two influences is referred to as ‘subsidiary culture’ (Hofstede, 1985). Subsidiary culture reflects a hybrid between the international organisational culture and the local national culture. As organisational culture is an internally developed shared system of meaning (Schein, 2009), subsidiary managers’ behaviour and decision-making are shaped by the local subsidiary culture, based on locally held norms, values, and beliefs. The local subsidiary culture can, therefore, have a powerful impact on innovation in the subsidiary. For example, if the subsidiary culture promotes intra-unit communication (Ghoshal & Bartlett, 1988), i.e. local employees sharing knowledge with each other about new opportunities as well as discussing ways to exploit those opportunities, it is likely to support innovation. While subsidiary cultures might deviate between subsidiaries across the MNC, an entrepreneurial culture that permeates the entire MNC is one contributing factor to innovation in subsidiaries.

2.10 Entrepreneurial Culture in MNCs

An entrepreneurial corporate culture can be described as an organisational culture that promotes the willingness to take risks, to learn, and to change (Mu, Gnyawali, & Hatfield, 2007). Dimitratos and Plakoyiannaki (2003) view entrepreneurial culture as embedded in the general context of organisational culture. They propose that organisations with an entrepreneurial culture tend to emphasise open communication and experimentation. These organisations also have systems in place that recognise and reward innovative efforts.

As MNCs operate within an international context, they need to be entrepreneurial on an international scale when seeking to innovate. Dimitratos and Plakoyiannaki (2003) define international entrepreneurship as an organisation-wide process, which is embedded in the organisational culture of the firm and which seeks to generate value through the exploitation of opportunities in the international marketplace. An entrepreneurial culture throughout the MNC can have a positive impact on innovation. A culture that provides autonomy to subsidiaries, and encourages open communication, experimentation, new initiatives, and risk-taking is likely to spark learning and innovations (Mu et al., 2007). An entrepreneurial culture has also been found to influence the motivation of a subsidiary to learn from diverse local environments and therefore influences localised subsidiary innovation (Mu et al., 2007).

While the concept of an entrepreneurial organisational culture has been discussed in the literature to some degree, a concept that has only recently been introduced to the multinational and subsidiary management literature is that of entrepreneurial culture in multinational subsidiaries. In his 1997 paper, Birkinshaw suggests that entrepreneurial culture – “one that motivates [...] employees to take the initiative” (p. 225) – in multinational subsidiaries should be the subject of further research. The concept has, however, been relatively unexplored. In a more recent paper, Birkinshaw, Hood, and Young (2005) called for further research on entrepreneurship in the multinational subsidiary and identified the entrepreneurial culture in subsidiaries as one of the issues needing further investigation.

A literature strand focusing on entrepreneurial subsidiaries based on research conducted on Scottish and other UK MNC subsidiaries is emerging (Boojihawon et al., 2007; Dimitratos et al., 2009). In their study into multinational subsidiary entrepreneurial culture, Boojihawon et al. (2007) identified global vision, entrepreneurial orientation, and entrepreneurial MNC management as the characteristics of an entrepreneurial culture. The construct of entrepreneurial orientation consists of innovativeness, proactiveness and risk-taking behaviour (cf. Dimitratos & Plakoyiannaki, 2003; McDougall & Oviatt, 2000). The authors further suggested that subsidiary autonomy, target market servicing, and responsiveness to local environment conditions represent some influences on the entrepreneurial culture of the subsidiary. The locus of entrepreneurship can vary significantly between subsidiaries (Boojihawon et al., 2007). Entrepreneurship in multinational subsidiaries can either be subsidiary-, headquarters-, or jointly-driven. This aspect of entrepreneurship ties in with the earlier discussion of the evolution of subsidiary roles in section 2.5.

This understanding of an entrepreneurial subsidiary (Boojihawon et al., 2007; Dimitratos et al., 2009) highlights the aspect of entrepreneurial culture in an MNC subsidiary which may manifest in both strategic and operational entrepreneurial activities (Dimitratos et al., 2009). By permeating different levels and functions of the organisation, a strong entrepreneurial culture in the subsidiary contributes to dispersed corporate entrepreneurship in the organisation. In summary, an entrepreneurial subsidiary is characterised by a strong entrepreneurial culture and orientation, dispersed corporate entrepreneurship, manifestations of both strategic and operational entrepreneurship, subsidiary global vision and leadership, increased subsidiary capabilities, entrepreneurial intra-MNC network activities, responsiveness to local environmental conditions, and

subsidiary autonomy (Dimitratos et al., 2009). Dimitratos et al. (2009) argued that the subsidiary-focused stream of research has culminated in the idea of entrepreneurial subsidiaries. This idea, which is based on the heterarchical view of the MNC, highlights the view that entrepreneurial subsidiaries seek to maintain an entrepreneurial culture throughout the entire organisation, engage in incremental as well as radical innovation, and make a positive economic contribution to their host country (Dimitratos et al., 2009). In an investigation into dispersed entrepreneurship, Williams and Lee (2011) found that ideas that originate in a subsidiary are found to be more likely to be adopted by the wider MNC when the subsidiary assumes a politically active role within the organisation's structure. However, they note that when a strong entrepreneurial culture is encouraged in the subsidiary, political heterarchy may become somewhat redundant. It could be argued that entrepreneurial culture in a subsidiary could be considered a key antecedent to subsidiary initiative (Birkinshaw, 1997), while also functioning as a guideline for desired entrepreneurial behaviour. Through the development of specialised resources, entrepreneurial culture in the subsidiary is seen to support subsidiary initiative (Birkinshaw et al., 1998).

2.11 Conclusion

This chapter provided a review of the concepts and characteristics of the MNC and subsidiary literature. Such a review was important to provide context for this study, presenting the roles that subsidiaries acquire and how these can develop. The influence that this context may have on the central variables under study may be quite substantial. Inherent in this analysis is the relationship that the subsidiary has with its headquarters and, in particular, the role of organisational culture as a means of communicating shared values. This chapter concluded by emphasising the importance of an entrepreneurial culture at the subsidiary level. This topic has been somewhat overlooked in the MNC subsidiary literature and only recently found traction. The next chapter presents a review of literature relating to the central constructs of this study – innovation and organisational culture. The chapter presents a discussion of how different dimensions of organisational culture can influence innovation.

3 LITERATURE REVIEW

3.1 Introduction

For the purpose of conducting a comprehensive literature review, two distinct strands of literature have been identified, organisational culture and innovation. This chapter begins with a discussion of the concept of innovation and the different forms of innovation. The differences between innovation and creativity are described, followed by a presentation of the determinants of successful innovation. Two diverging views in the innovation literature are highlighted in the final part of this section and the rationale for viewing organisational culture as an influence on innovation is considered. The following section introduces the concept of organisational culture with a focus on its definition and its influence on organisational performance. The development of subcultures, management of organisational culture as well as factors that may influence organisational culture are discussed next. From this the measurement of organisational culture is outlined, providing a detailed overview of the instruments utilised in this study, before typologies of organisational culture are presented. The relationship between organisational culture and innovation is further explained. The chapter concludes with a presentation of the research model used in this study and a discussion of the five organisational culture dimensions that are central to the model. Taken together, the sections in this chapter further explicate the importance of organisational culture and demonstrate how organisational culture can influence innovation.

3.2 Innovation

3.2.1 A Definition of Innovation

In the new global economy, innovation has become a central issue for organisations. This is illustrated by the fact that half of today's revenues in the private sector, especially in high-technology segments such as the ICT industry, flow from products and services that are less than five years old (Ellonen, Blomqvist, & Puumalainen, 2008). However, despite this acknowledgement of the importance of innovation, to date, no single definition of innovation has been agreed upon. This is largely due to the broad range of disciplinary approaches to innovation research, including management science, economics, geography, sociology and psychology (Tidd, 2001). These disciplines have adopted very different methods, definitions and samples for innovation research. Across the different disciplines, there is agreement, however, that innovation is more than just a creative process and that it is necessary to distinguish between an invention and an innovation. While creativity and idea generation are the first steps of innovation (Amabile, 1997), the creation of a new idea on its own is not an innovation. Innovation is the utilisation and exploitation of a new idea (Hauschildt & Salomo, 2007; Scholtissek, 2009) or, in other words, the implementation of a new idea (Amabile, 1997; Amabile et al., 1996).

In their review of innovation research in economics, sociology, and technology management, Gopalakrishnan and Damanpour (1997) find that studies at the organisational level tend to see innovation either as a product or outcome or as a process. Studies using an outcome approach aim to identify contextual, structural, and behavioural characteristics that differentiate innovative organisations from non-innovative ones. Researchers using a process approach, on the other hand, aim to describe a broad class of events and sequences central to the innovation process. For the purpose of this study, innovation is investigated using an outcome approach, which is aligned with Ahmed's (1998) conceptualisation of organisational culture as an antecedent of innovation.

Several definitions of innovation have been developed, each crafted towards the respective study's focus. One of the earliest definitions of innovation is that of Schumpeter, who defines innovation as a new good or quality of a good; a new method of production; a new market; a new source of supply; or a new organisational structure (Schumpeter, 1934 in Goffin, Mitchell, & Herstatt, 2009, p. 29). In contrast to Schumpeter's definition, which mainly focuses on production, Rogers (1983) defines innovation as "an idea, practice or object that is perceived as new by an individual or other unit of adoption" (p. 11). Porter

presents a definition that also includes organisation-wide learning processes. He defines innovation “to include both improvements in technology and better methods or ways of doing things. It can be manifested in product changes, process changes, new approaches to marketing, new forms of distribution, and new concepts of scope . . . [innovation] results as much from organisational learning as from formal R&D.” (Porter, 1990 in Goffin et al. 2009, p. 29).

Tidd (2001) suggests that innovation manifests itself in two basic forms: product innovation – changes in the products or services that an organisation offers – and process innovations – changes in the ways that products or services are created and delivered. While innovation in products and processes has been a familiar concept in the innovation literature, only more recent definitions of innovation have included a wider range of forms of innovation. The OECD (2005) defines innovation as “[...] the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations” (p. 46). This broader definition of innovation has since also been adopted by the United States National Science Board (National Science Board, 2012).

The degree of novelty of an innovation has also been discussed in the literature. An innovation can either be new to the organisation (Davila, Epstein, & Shelton, 2013), new to the customer (Wang & Ahmed, 2004 in Crossan & Apaydin, 2010) or new to the market (Lee & Tsai, 2005). The OECD's Oslo Manual (2005) proposes that the minimum requirement for an innovation is to be new or significantly improved to the organisation.

3.2.2 Forms of Innovation

Having defined innovation, it is important to distinguish between different forms of innovation. There are four main forms of innovation. A product innovation is the introduction of a product or service with new or significantly improved characteristics (Damanpour & Aravind, 2012; Davila et al., 2013; OECD/Eurostat, 2005; Tidd, Bessant, & Pavitt, 2009). The term ‘product’ is used to cover both products (goods) and services. A process innovation is the implementation of a change in the way in which a product or service is created and delivered (Damanpour & Aravind, 2012; OECD/Eurostat, 2005; Tidd et al., 2009). Marketing innovation is defined as the utilisation of a new marketing method that has not previously been used by the organisation (OECD/Eurostat, 2005). This can involve significant changes in product design or packaging, product placement, product promotion or pricing. An organisational innovation is the implementation of a new

organisational method that has not previously been used in the organisation and has been developed as part of the organisation's strategy (OECD/Eurostat, 2005). This can include business practices, workplace organisation or external relations. Davila et al. (2013) identify business model innovation as an additional form of innovation. Business model innovation is described by "how a company creates, sells, and delivers value to its customers" (Davila et al., 2013, p. 31). The concepts of business model innovation and organisational innovation overlap to a significant degree.

In the last decade, a number of additional forms of innovation have been introduced to the literature, such as open innovation (Chesbrough, 2006), value innovation (Kim & Mauborgne, 2005) and frugal innovation (Tiwari & Herstatt, 2012; Zeschky, Widenmayer, & Gassmann, 2011). Open innovation has been defined as "the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively" (Chesbrough, 2006). Value innovation is conceptualised as the "simultaneous pursuit of differentiation and low cost", which creates additional value for both the organisation and the customer (Kim & Mauborgne, 2005). Frugal innovation has been described as seeking to "minimise the use of material and financial resources in the complete value chain (development, manufacturing, distribution, consumption, and disposal) with the objective of reducing the cost of ownership while fulfilling or even exceeding certain pre-defined criteria of acceptable quality standard" (Tiwari & Herstatt, 2012, p. 3). Zeschky et al. (2011) define frugal innovation "as responding to severe resource constraints with products having extreme cost advantages compared to existing solutions" (p.39). These additional forms of innovation have briefly been outlined here to illustrate recent developments in the innovation literature. They will not further be considered for the purpose of this study as one could argue that they represent new innovation strategies and not new forms of innovation.

The literature also distinguishes between two different magnitudes of innovation, radical and incremental, depending on the degree of change associated with the innovation (Davila et al., 2013; Gopalakrishnan & Damanpour, 1997; Tidd et al., 2009). Radical innovations represent a major advance in a product, process or service, changing the nature of a product, process or service. It represents a clear departure from existing practices. Radical innovation is often associated with business model innovation (Crossan & Apaydin, 2010). Incremental innovations are small-scale changes in a product, process or service. They are essentially modifications or improvements of an existing product that reinforce the existing

capabilities of the organisation. Incremental innovation is often associated with product or process innovation (Crossan & Apaydin, 2010).

Many studies also differentiate between technical and administrative innovations (Crossan & Apaydin, 2010; Gopalakrishnan & Damanpour, 1997). Technical innovations are concerned with the products, processes, and technologies used to produce products or deliver services that are related to the basic work activity of an organisation. Administrative innovations, on the other hand, focus on the organisational structure, administrative processes, and human resources and are therefore only indirectly concerned with the basic work activity of the organisation.

This study covers product, process, marketing, and organisational innovation in line with the OECD's definition of innovation. Innovation can be incremental or radical, technical or administrative. This broad definition is selected because it allows for a full estimate of organisational culture adaptation to innovation within an organisation.

3.2.3 Creativity

One of the instruments utilised to measure organisational culture in this study was designed to measure creativity in an organisation. It is therefore important to briefly note the relationship between creativity and innovation. Whereas innovation has been defined as the successful implementation of creative ideas within an organisation, creativity is defined as the production of novel and useful ideas (Amabile et al., 1996). It can be argued that all innovation begins with creative ideas (Amabile et al., 1996) and creativity can, therefore, be considered an antecedent of innovation. Individual creativity is considered to serve as the foundation for organisational creativity and innovation (Amabile, 1988). The following integrative definition of creativity and innovation illustrates the differences between the concepts:

Creativity and innovation at work are the process, outcomes, and products of attempts to develop and introduce new and improved ways of doing things. The creativity stage of this process refers to idea generation, and innovation refers to the subsequent stage of implementing ideas toward better procedures, practices, or products (Anderson, Potočnik, & Zhou, 2014, p. 1298).

The social environment can influence both the level and the frequency of creative behaviour (Amabile et al., 1996). It is therefore important that the organisation has an appropriate organisational culture that facilitates creativity and, in turn, innovation.

3.2.4 Determinants of Successful Innovation

Innovation is argued to provide a critical source of sustainable competitive advantage to organisations (Khazanchi, Lewis, & Boyer, 2007). Due to this important role of innovation, researchers have long been interested in identifying what determines innovation success. In studies focusing on innovation at the organisational level, a number of determinants of successful innovation have been identified. As early as 1986, Cooper and Kleinschmidt (1986) suggested that management support and commitment are fundamental to new product success. This finding was also supported by a 1994 study by Lee and Na (1994), who noted that management support is just as significant for radical as it is for incremental product innovation. A small-scale research review by Read (2000) across different forms of innovation further suggested that management support for innovation and an innovative culture are the most important determinants of innovation.

Having discussed innovation, it becomes apparent that it is a complex, context-sensitive phenomenon (Wolfe, 1994). The extent to which an organisation can be regarded as innovative can be impacted by its culture (Dobni, 2008).

3.2.5 Innovation-Supportive Culture

Until recently, innovation had mostly been considered as a process or a sequence of activities and factors that may impact innovation, such as an organisational culture for innovation, had only been partially acknowledged (Meissner & Kotsemir, 2016). This exemplified the strong trend in the innovation management literature to view innovation as manageable by means of an innovation process that can be more or less rigidly structured (Meissner & Sprenger, 2010). This trend resulted in a higher number of attempts by management to employ linear innovation processes – either derived from literature or from practice. Examples of this approach are innovation process models such as the Cooper Stage-Gate-Model (Cooper, 1990), the Funnel Model (Terwiesch & Ulrich, 2009), or the Open Innovation Process Model (Chesbrough, 2006). Whereas this approach presents easy to follow models of the innovation process, it does not provide a means of dealing with innovation dynamics that cannot be regulated by a process model. These models make little to no attempt to consider the social determinants of the innovation process.

Models such as the Schein Culture Model (Schein, 2009), the Sackmann Iceberg Model (Sackmann, 1991), or the Want Corporate Culture Hierarchy (Want, 2003) explain the relevance of implicit and not easily observable dynamics to innovation within organisations. The tacit knowledge held by organisational members is expressed in

behaviours and the organisational culture (Nonaka & Takeuchi, 1995). Organisational members' beliefs and assumptions about innovation can have a substantial influence on the social processing of innovation projects. So, even when it is not explicitly considered, aspects of organisational culture can have a strong influence on the innovation process (Meissner & Sprenger, 2010).

Whereas a number of studies have been undertaken to examine the link between organisational culture and innovation (Amabile et al., 1996; Damanpour, 1991; Lumpkin & Dess, 1996), the concept of an innovation-supportive culture is relatively new to the innovation literature. However, a number of dimensions that make up an innovation-supportive culture have been identified in the literature. Management support, organisational reward systems supportive of innovation, and workload pressures have been proposed as three dimensions of an innovation-supportive culture (Chandler, Keller, & Lyon, 2000). Initiative-taking, creativity, risk-taking, mutual trust, early involvement, receptivity to change, autonomy, collaboration, and feedback-seeking have further been identified as dimensions that are prevalent in an innovation-supportive culture (Jassawalla & Sashittal, 2002). Dombrowski et al. (2007) presented eight elements defining an innovation-supportive culture in an organisation: innovative mission and vision statements, democratic communication, safe spaces, collaboration, flexibility, boundary spanning, incentives, and leadership. While a general definition of innovation-supportive culture does not exist, one can notice a convergence of organisational culture dimensions that have identified as supporting innovation. A discussion of the relationship between innovation and organisational culture as well as a more in-depth discussion of the concept of innovation-supportive culture can be found in section 3.6, following the review of the organisational culture literature.

3.3 Organisational Culture

3.3.1 A Definition of Organisational Culture

Following Pettigrew's (1979) introduction of the concept of organisational culture to organisational studies, the first serious discussions and analyses of organisational culture emerged out of the focus on comparative management research in the 1980s, especially on Japanese management style (Deal & Kennedy, 1988; Ouchi, 1981; Pascale & Athos, 1981; Peters & Waterman, 1982) and resulted in an increased attention on organisational culture as a determinant of organisational success. Organisational culture has been described as the character of an organisation (Louis, 1985b), its ideology (Louis, 1985b), image (Louis,

1985b), identity (Denison, 1984), ethos (Morgan, 2006) and the glue that holds the organisation together (Smircich, 1983; van den Berg & Wilderom, 2004).

To date there has been little agreement on a single definition of organisational culture; instead, the understanding of the concept varies according to the point of view taken. Organisational culture has been defined as basic assumptions (Schein, 1984, 1990, 1991, 1996, 2009), shared values and beliefs (Alvesson, 1995; Baker, 1980; Barney, 1986; Denison, 1984, 1990, 1996; Gordon, 1991; Peters & Waterman, 1982; Posner, Kouzes, & Schmidt, 1985; Schwartz & Davis, 1981), shared meanings (Louis, 1985a; Smircich, 1985; van den Berg & Wilderom, 2004), norms (Trice & Beyer, 1984; O'Reilly, 1989) and “the collective programming of the mind” (Hofstede, 1994). Over the years, further refinements of organisational culture definitions resulted in as many as “164 different definitions of culture” (Fisher, 2000, p. 43). Table 3.1 provides an illustration of the different definitions of organisational culture in the literature. Even though a single definition of organisational culture seems elusive, three common attributes of organisational culture appear to arise across the varying views within sociology, psychology, anthropology, and management science: firstly, the concept that something needs to be shared in order to be cultural (Schein, 1991), secondly, that organisational culture is a social phenomenon that is influenced by environment and history (Denison & Mishra, 1995; Hofstede, Neuijen, Ohayv, & Sanders, 1990; Morgan, 2006; Ravasi & Schultz, 2006; Smircich, 1983) and thirdly, that organisational culture has many dimensions (Schein 1984, 1990, 1991).

In her widely influential work on organisational culture, Martin (1992, 2002) proposes that the view that culture is shared is but one of three perspectives, specifically the integrationist perspective. The other two are the differentiation and fragmentation view. The integrationist perspective focuses on manifestations of culture that have mutually consistent interpretations and sees consensus throughout an organisation. Ambiguity is generally excluded. Across different integration studies, there is, however, disagreement about what exactly is being shared. The fragmentation perspective sees ambiguity as the essence of organisational culture and denies the necessity for sharedness. The differentiation perspective provides a compromise between the two other perspectives. It concentrates on cultural manifestations that have inconsistent interpretations, which leads to culture being defined as that which is shared by a group. The focus is on consensus within subcultures. In this perspective, organisational culture is not unitary but characterised as a nexus where environmental influences intersect, creating a nested, overlapping set of subcultures within a permeable organisational boundary (Martin, 1992,

pp. 111–114). Martin (2002) has recently argued for a matrix framework for studying cultures in which all three theoretical views are applied simultaneously. This study employs an integrationist perspective on organisational culture, focusing on the perception that all mentioned cultural aspects are consistent and reinforce each other. This perspective is consistent with using a quantitative approach to measuring organisational culture (Martin, 2002). The integrationist perspective is also reflected in the choice of organisational culture model for this study, as Schein takes an integration perspective stance (cf. Martin, 2002).

Table 3.1: Definitions of Organisational Culture

Author(s)	Reference Page Number	Definition
Schwartz & Davis (1981)	p. 33	Culture is a pattern of beliefs and expectations shared by the organisation's members. These beliefs and expectations produce norms that powerfully shape the behaviour of individuals and groups in the organisation.
Denison (1984)	p. 5	Culture is a set of values, beliefs, and behaviour patterns that form the core identity of an organisation.
Trice & Beyer (1984)	p. 654	Culture has two basic components: (1) its substance, or the networks of meanings contained in its ideologies, norms, and values; and (2) its forms, or the practices whereby these meanings are expressed, affirmed, and communicated to members.
Smircich (1985)		A fairly stable set of taken-for-granted assumptions, shared beliefs, meanings and values that form a kind of backdrop for action.
Barney (1986)		Organisational culture is a complex set of values, beliefs, assumptions and symbols that define the way in which a firm conducts its business.
Denison (1990)	p. 2	The underlying values, beliefs, and principles that serve as a foundation for an organisation's management system as well as the set of management practices and behaviours that both exemplify and reinforce those basic principles.
Martin (1992)	p. 38	The manifestations of cultures in organisations include formal, and informal practices, cultural forms (such as rituals, stories, jargon, humour, and physical arrangements), and content themes. Interpretations of these cultural manifestations vary. The pattern or configuration of interpretations (underlying a matrix of cultural manifestations) constitutes culture.
Hofstede (1994)	p. 1	The collective programming of the mind which distinguishes the members of one category of people from another.
van den Berg & Wilderom (2004)		Shared perceptions of organisational work practices within organisational units.

Ravasi & Schultz (2006)	Set of shared mental assumptions that guide interpretation and action in organisations by defining appropriate behaviour for various situations.
Schein (2009)	Culture is a pattern of shared tacit assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems

Organisational culture is a complex, holistic concept that has been captured in a variety of different models. Trice and Beyer (1984) propose that culture is made up of two basic components: its substance and its forms. Its substance consists of a network of meanings contained in its ideologies, norms, and values. Its forms are the practices within an organisation whereby meanings are communicated to organisational members. As a result of their study of organisational cultures, Hofstede et al. (1990) present a six-dimensional model of organisational culture. The dimensions are process oriented vs results-oriented, employee oriented vs job oriented, parochial vs professional, open system vs closed system, loose control vs tight control and normative vs pragmatic. The process-oriented vs results-oriented dimension contrasts a concern for means with a concern for goals. The second dimension, employee oriented vs job oriented, contrasts a concern for people with a concern for “getting the job done”. The third dimension, parochial vs professional, contrasts work units in which the employees hugely identify with the organisation with work units in which the employees derive their identity from the type of work they are performing. Dimension four, open system vs closed system, captures the climate of communication within the organisation, whereas dimension five, loose control vs tight control, is concerned with the amount of internal control exerted by the organisation. Lastly, dimension six, normative vs pragmatic, deals with the customer orientation of the organisation. Hofstede et al. found that these six dimensions can be used to quantify organisational culture to some extent. To facilitate comparison of different organisational cultures, van den Berg and Wilderom (2004) propose the following five dimensions of organisational culture: autonomy, external orientation, interdepartmental coordination, human resource orientation, and improvement orientation. The first dimension, autonomy, is task related and captures to what extent employees are free to make decisions at their job level. External orientation refers to open systems theory, in that it captures how an organisation relates to its external environment. The third dimension, interdepartmental coordination, describes how communication across different departments is perceived,

while the fourth dimension, human resource orientation, captures the extent to which human resource content is a part of the organisational culture. Lastly, the fifth dimension, improvement orientation, describes the level of proactivity towards better organisational results.

While there are a number of different models and interpretations of the concept of organisational culture, Schein (1984, 2009, p. 21) warns not to oversimplify and presents three levels which underpin organisational culture (Figure 3.1): artifacts, espoused values and underlying assumptions.

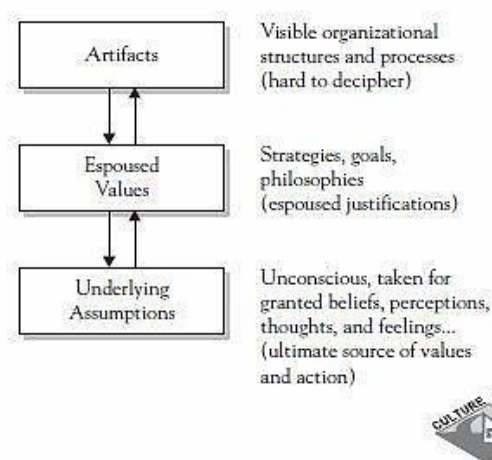


Figure 3.1: The Three Levels of Culture. Source: Schein (2009, p. 21)

Artifacts exist on the surface and are easy to observe but hard to decipher. Artifacts are those characteristics of the organisational culture that can be seen, heard and felt, e.g. the physical space and the language used. The next level is espoused values, which influence the behaviour of organisations' members. Possible discrepancies between the espoused values and observed behaviour are rooted in the deepest level, the shared tacit assumptions, e.g. a hypothesis that gradually came to be treated as reality. These shared tacit assumptions have their origin in the historic evolution of the organisation and are taken for granted and non-negotiable. Henceforth these underlying assumptions form the basic framework of an organisation's culture. All three levels of organisational culture continue to influence each other. Based on this model, Schein (2009) defined organisational culture as follows:

Culture is a pattern of shared tacit assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, is to be taught to

new members as the correct way to perceive, think, and feel in relation to those problems (p. 27).

To further illustrate the different layers or levels that constitute culture, one can use Sackmann's (1991) Iceberg Model of Culture (Figure 3.2). Sackmann distinguishes between the visible components of culture, such as corporate artifacts, verbal, and non-verbal behaviour, and the cognitive components of culture, which are below the surface. This distinction in terms of accessibility between the manifestations of culture and the deeper cognitive components of culture shows a considerable overlap with Schein's model of culture. Similar to Schein, Sackmann (1991) also explains that understanding the basic beliefs underpinning the manifestations of culture is critical for deciphering the visible manifestations. She warns that a sole focus on corporate artifacts may result in two problems: Firstly, the currently observable artifacts and behaviours may not represent the current underlying beliefs but those of the past. Secondly, while observable artifacts and behaviours might seem comparable across organisations, they might have completely different meanings when viewed in the context of their respective underlying cultural beliefs.

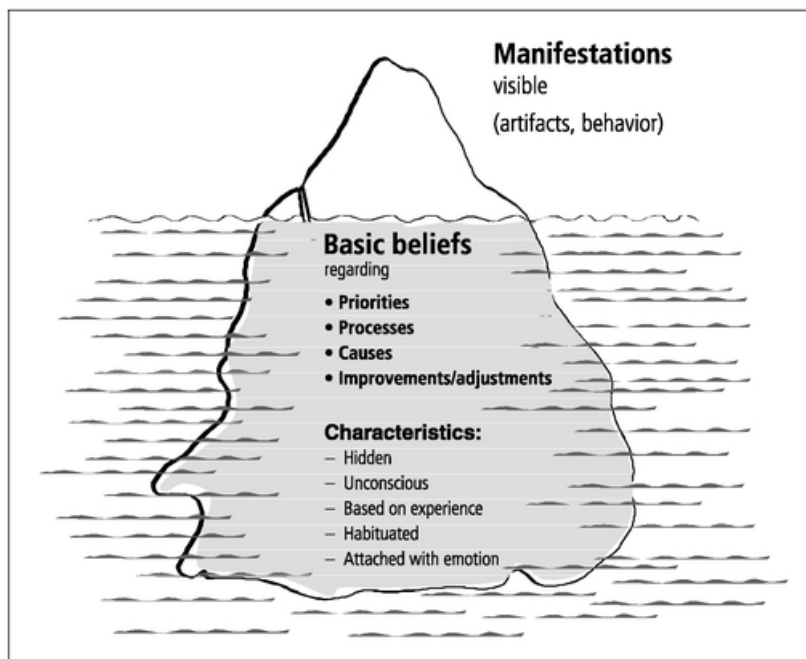


Figure 3.2: Sackmann's Iceberg Model of Culture. Source: Sackmann (2002, p. 27)

In contrast to Schein and Sackmann, Hatch (1993) suggests that culture is made up of processes that involve both stability and flexibility. She makes two fundamental changes to Schein's model by introducing symbols as a new element and focusing on the relationships

linking the different elements of culture so that the elements of culture themselves are made less central.

While a variety of definitions of the term organisational culture have been suggested, this thesis will use the definition first suggested by Schein (1984, 2009), which has been presented above.

The studies presented thus far outline that organisational culture is a complex and holistic concept. Its major strength lies in its ability to direct attention to the symbolic significance of almost every aspect of organisational life (Morgan, 2006). This highlights how organisations are constructed by shared systems of meaning (Morgan, 2006; Schein, 2009).

The previous sections have provided a brief overview of the concept of organisational culture. In the next sections, the link between organisational culture and organisational performance and whether there is one best culture to have regardless of organisational specifics is discussed.

3.3.2 Organisational Culture and Organisational Performance

Numerous studies have attempted to explain the link between organisational culture and organisational performance (Alvesson, 2002; Baker, 1980; Barney, 1986; Carmeli & Tishler, 2004; Denison, 1984, 1990; Denison et al., 2004; Denison & Mishra, 1995; Gordon & DiTomaso, 1992; Hofstede, 1998a; Ogbonna & Harris, 2000; Ouchi & Wilkins, 1983; Peters & Waterman, 1982). It is now widely accepted that organisational culture is linked to business performance and therefore is important to success.

In their early work on organisational culture, Peters and Waterman (1982, p. 75) drew our attention to a dominant and coherent culture as an essential quality of an excellent company. They propose that culture works as a regulator for a number of important variables and that it provides meaning.

To determine the effects of organisational culture on organisational performance, Denison (1984) analysed the return on investment of a number of different firms. His findings suggest that companies with a participative culture reap a return on investment that averages nearly twice as high as that in organisations with less efficient cultures. Barney (1986) outlines three preconditions that must be met by an organisational culture if it is to provide sustainable competitive advantage. Firstly, the culture must be valuable to the organisation, secondly, it must be rare, and thirdly, it must be imperfectly imitable. The value of the organisational culture is measured in financial terms – low costs, high sales,

and high margins. This link to financial measures is also employed by Gordon and DiTomaso (1992), who state that the greater the strength of organisational culture is, the stronger the organisation's financial performance in future years will be. This hypothesis is consistent with Denison's (1984, 1990) findings that strong culture, measured as consistency of survey responses within organisations, is related to organisational performance in subsequent years.

Denison and Mishra (1995) went beyond financial measures and acknowledged a more complex relationship between organisational culture and organisational performance. The results of the study suggest that stability traits of an organisational culture, like mission and consistency, could have an impact on profitability, whereas flexibility traits, like involvement and adaptability, are more closely linked to growth. This finding is supported by a later study undertaken by Denison et al. (2004), which extends the geographical scope of the earlier study to the major regions of the world.

Hofstede (1998a) also shows that organisational culture does indeed have an impact on organisational performance. He investigates 33 different factors but finds that only seven of these factors make a substantial contribution. These are attitudes and practices related to communication and cooperation, attitudes about work content, values about work context, gender issues, attitudes about the direct boss, attitudes towards work, and values about work content.

In their study on organisational culture and performance, Ogbonna and Harris (2000) focus on UK companies. They find that while there are direct links between organisational culture and performance, these links only exist for two specific cultural traits, competitiveness and innovation.

Collectively, these studies outline a critical role for organisational culture in relation to an organisation's performance. However, criticism of the predominant view of a clear link between organisational culture and performance does exist.

Alvesson (2002) strongly critiques this predominant view and suggests that culture should be viewed as being reflected in actions instead of directly influencing an organisation's performance. He proposes that viewing culture as "a terrain of possibilities and pitfalls" (p. 68) can provide much richer insights and can, therefore, form a better basis for decision-making. Carmeli and Tishler (2004) are also critical of the notion of a clear link as they propose that organisational culture is just one of six factors that can explain organisational performance. The influences on organisational performance are more complex than an

influence of just one factor. Similarly, Denison and Mishra (1995) argue that organisations and their effectiveness are also influenced by society, industry, occupations and regulatory environments. These factors need to be incorporated into a more general theory.

3.3.2.1 Strong/Positive Culture

Moving on now to consider the concept of strong culture, one view that is held in the organisational culture literature is the idea that an organisation can have a strong culture that has an impact on organisational performance and therefore represents a competitive advantage. This perspective is based on the resource-based view of the firm. A number of studies have supported the hypothesis that successful companies have strong cultures (Deal & Kennedy, 1988; Peters & Waterman, 1982; Schein, 2004). Similar to organisational culture, the strength of an organisational culture is defined in various ways: as coherence (Deal & Kennedy, 1988); as stability (Schein, 1984, 2004); as penetration (Louis, 1985a); as homogeneity (Hofstede et al., 1990; Schein, 1984); or as consistency (Denison, 1990). O'Reilly and Chatman define a strong culture as "a set of norms and values that are widely shared and strongly held throughout the organisation" (O'Reilly & Chatman, 1996 in Sørensen, 2002).

The advantage of a strong culture is seen in its potential impact on organisational performance. The strength of shared values within an organisation is proposed to have an effect on the quality and character of managerial commitment and, therefore, on the effort exerted on behalf of the organisation (Posner et al., 1985). As a result of their major study, Hofstede et al. (1990) confirmed Peters and Waterman's claim that strong cultures are more results-oriented when strength of culture is interpreted as homogeneity.

Strong culture on its own, however, might be too simple of a construct. Gordon and DiTomaso (1992) pointed towards the importance of strength of culture, defined as consistency, and appropriateness of culture, as it relates to the content of culture. When strength and appropriateness of culture are combined, better results are achieved than with a singular focus on either strength or appropriateness. A drawback to a strong culture might be its lack of adaptability. While organisations exhibiting a strong culture are argued to have a more reliable (less variable) performance, these benefits disappear in volatile environments (Sørensen, 2002). So, whereas organisations with a strong culture seem to excel at exploiting established competencies, they are seen to have difficulty exploring and discovering new competencies that better suit changing environmental conditions (Sørensen, 2002). Weick (1985, p. 385) succinctly described the dilemma of strong culture

organisations: “A coherent statement of who we are makes it harder for us to become something else.”

Schein (1984) warned that the relationship between strong culture and organisational effectiveness is much more complex than just a direct link. He sees the content of culture and the degree to which solutions fit the problems as the more critical variables. This view is further supported by Saffold (1988), who presented a comprehensive critique of the strong culture hypothesis. He suggested employing measures of cultural dispersion and cultural potency to better evaluate cultural phenomena. Similarly, Hofstede et al. (1990) noted that their model of organisational culture, described previously, does not support the notion that any position on one of the six dimensions of organisational culture is intrinsically good or bad. The positioning on the dimension scales depends on the organisation’s strategy. So, a cultural feature that presents a competitive advantage to one organisation might not be a competitive advantage to another organisation operating in a different industry. This view is in stark contrast to early views on strong culture, like that of Peters and Waterman, who stated that there is “one best way” of operating.

Sadri and Lees (2001) introduced the concept of a positive culture which leans on the previously discussed concept of a strong culture but is of a broader scope. They outlined the different elements of a positive culture as being supported by a clear corporate vision, being reinforced by corporate values that are consistent with the purpose of the organisation and aligned with the personal values of the organisational members. This definition of a positive culture highlights the similarity to the strong culture concept but also shows the broader scope by including the support by a clear corporate vision and the alignment of organisational values with personal values of the organisational members. Sadri and Lees furthermore stated that a positive culture can provide a significant competitive advantage to an organisation and can even be a prerequisite for success.

Overall, these studies highlight the impact organisational culture can have on organisational performance.

3.3.3 Subcultures and Organisational Culture

The existence of subcultures has been widely discussed in the literature (Adkins & Caldwell, 2004; Louis, 1985a; Sackmann, 1992; Saffold, 1988; Schein, 1984, 1996, 2009; Van Maanen & Barley, 1985). Van Maanen and Barley (1985) defined an organisational subculture as “a subset of an organisation's members who interact regularly with one another, identify themselves as a distinct group within the organisation, share a set of

problems commonly defined to be the problems of all, and routinely take action on the basis of collective understandings unique to the group” (p. 38). As discussed earlier, the differentiation perspective (Martin, 1992, 2002) focuses on these cultural manifestations that have inconsistent interpretations and, therefore, on the existence of subcultures.

In 1984, Schein first proposed that an organisation can indeed have a number of subcultures. While these different subcultures could potentially be in conflict with each other, he explains that one overarching organisational culture can still exist as long as a common experience exists in the organisation. The findings of Sackmann’s (1992) study of the existence and formation of subcultures, support Schein’s proposal that one overarching culture can exist alongside a number of different subcultures. This notion is also further reinforced by Adkins and Caldwell (2004), who proposed that subcultures can emerge even in organisations that focus on building a strong, consistent culture. In contrast, Louis (1985) argued that it is inappropriate to assume one culture per organisation. She outlined that different sites of culture can be found within an organisation and focuses on the concept of group culture, which is defined as a set of understandings or meanings shared by a group of people. This view is also held by Saffold (1988), who suggested that it may be more accurate to study how a number of different subcultures interact to influence outcomes than to assume one overarching organisational culture.

In an investigation into subcultures, Schein (1984) first identified the possibility of three distinct subcultures coexisting in a given organisation: a managerial culture, an engineering culture, and a science culture. In 1996, he published a paper in which he described the operator culture, the engineering culture, and the executive culture. The operator culture evolves locally within organisational units and is grounded in an awareness of the capability of good people. The engineering culture, on the other hand, represents the basic design elements of the technology underlying the work of the organisation and has the knowledge of how that technology is to be utilised. It seeks to minimise human influence on the system. Lastly, the executive culture is the set of tacit assumptions that CEOs and their immediate subordinates share worldwide. They see themselves as removed from the rest of the organisation. Hofstede (1998), similar to Schein, also identified three distinct subcultures: the professional, administrative, and customer interface culture. The professional culture consists of highly educated individuals and includes executives; the administrative culture is made up of individuals that perform administrative and standardised tasks, and the customer interface culture represents those employees that are located away from the office and in direct contact with customers.

These examples indicate how different professional backgrounds can have an impact on the development of subcultures. Indeed, a number of studies have found that specialisation results in local cultures and that professional cultures (e.g. engineering) develop in special groups (Louis, 1985a; Ouchi & Wilkins, 1983; Schein, 1984, 1996; Van Maanen & Barley, 1985). Generally, it is assumed that segmentation of the workforce to seek the benefits of efficiency and productivity promotes the possibility of a development of subcultures. Different subcultures may, therefore, exist at the top of an organisation, in a division, at a hierarchical level, in a department, and in any group within the organisation (Louis, 1985a; Schein, 1984, 1996, 2009; Van Maanen & Barley, 1985). In 2009, Schein revisited the topic and concluded that as organisations grow and mature they differentiate themselves into many subcultures based on professional background, functions, locations, and hierarchy, while concurrently developing their own overall culture. Subcultures can also develop as a result of importation through mergers and acquisitions (Trice & Beyer, 1984; Van Maanen & Barley, 1985) and technological innovation (Van Maanen & Barley, 1985).

A development of subcultures is often seen as potentially problematic as the isolation of subcultures could cause problems to the success of the organisation as a whole (Deal & Kennedy, 1988). Schein (1996, 2009) explained that a lack of alignment between different subcultures can hinder learning in an organisation and therefore cause organisational innovations not to occur at all or fail to survive. Hofstede (1998) also pointed out that management needs to be aware of the cultural variety that exists within an organisation and that the level of cultural variety needs to be monitored. This awareness can prevent parts of the organisation from failing because their subcultural needs are in conflict with the overarching organisation-wide culture.

The evidence presented in this section suggests that subcultures do develop in organisations for a number of different reasons as discussed above. An awareness of subcultures seems crucial to the management of an organisation and the fit or alignment between different subcultures and the overarching organisational culture should be monitored.

3.3.4 Management of Organisational Culture

Along with the existence of subcultures, the question of whether organisational culture can actively be managed or changed has been debated in the literature.

Most studies seem to view organisational culture as something that can actively be shaped by the organisation's management (Baker, 1980; Hofstede, 1994; Ouchi & Wilkins, 1983;

Schwartz & Davis, 1981), even if only to some extent. Schwartz and Davis (1981) outlined that there are four choices that management can make with regard to culture. Firstly, they can choose to ignore the culture. However, this can seldom be done when making informed management decisions. Secondly, management can decide to manage around the culture which depends on the circumstances the organisation is in. Thirdly, the culture can be changed to fit the strategy which must be done in some circumstances. Lastly, the strategy can be changed in order to align with the organisational culture. However, Schwartz and Davis provided a rather simplistic overview of the choices that management can make and offered no detailed explanation of the circumstances in which management should decide to manage around the culture or change the culture to fit the strategy.

Alvesson (2002) agrees with the view that organisational culture can be managed to a limited extent but argues that whether or not this characteristic of culture is seen as desirable is strongly linked to the overall view of culture one takes. This can be explained by Schein's (2009) illustration of culture as the accumulated learning of a group. Actively influencing the accumulated learning of a group, which in itself is a stable and difficult to change phenomenon, might simply not be desirable.

Cameron and Quinn (2011) argue that without a change in organisational culture, no other fundamental changes in the organisation will take hold. If the underlying values, orientations, and goals stay constant, then procedures and strategies that have been changed will return to that constant. Schein (2004) alludes to one way of changing organisational culture through management. As management act as role models in exhibiting the desired behaviours in the organisation, changing those displayed behaviours would have an effect on the organisational culture. It is questionable, however, to what extent this would impact the organisation's overall culture. Also, it is not clear how long this change in culture would actually take to manifest.

3.3.5 Influences on Organisational Culture

3.3.5.1 National Culture and Organisational Culture

Organisational culture and its link with national culture has been an object of research since the early 1980s. The interest in this specific area seems to stem from the comparative nature of early studies and the fact that management characteristics were seen as inherently American or Japanese and, therefore, strongly linked with national culture (Ouchi, 1981; Pascale & Athos, 1981).

The question to what extent national culture shapes the culture of an organisation has received considerable attention since Hofstede's (1980) major study. Generally, the results show that national culture has some influence on organisational culture (Denison & Mishra, 1995; Hofstede, 1985; Hofstede et al., 1990). Hofstede (1985) identifies four dimensions in which national value systems differ: power distance, uncertainty avoidance, individualism, and masculinity. Power distance refers to the extent to which individuals accept that power in organisations and institutions is unequally distributed, whereas uncertainty avoidance describes the extent to which society members feel comfortable with uncertainty or ambiguity. Individualism represents the preference for a loosely knit social framework in contrast to a tightly knit one, represented by collectivism. Finally, masculinity refers to the extent to which the society embraces characteristics such as assertiveness and material success.

Recently, studies have focused on the relationship between organisational culture and organisational effectiveness in countries other than the United States (Carmeli & Tishler, 2004; Ogbonna & Harris, 2000; Ravasi & Schultz, 2006) or the applicability of research findings from a US context in other countries (Fey & Denison, 2003). The most comprehensive study of the relationship between organisational culture and organisational effectiveness was the Global Leadership and Organizational Behavior Effectiveness (GLOBE) project (House, Hanges, Javidan, Dorfman, & Gupta, 2004), which collected data on societal culture, leadership, and organisational culture from over 17,000 respondents in 62 cultures. The results show that societal and organisational culture influence the kind of leadership found to be acceptable and effective by people within that culture. Brodbeck et al. (2004) found that societal culture has the most significant and strongest effect on organisational culture, whereas industry only has a weak influence. In summary, national culture has an impact on organisational culture. Yet, it does not determine the culture of an organisation, it merely presents an influence.

3.3.5.2 Industry Culture and Organisational Culture

Previous studies have reported that organisational culture is also strongly influenced by the characteristics of the industry in which the company operates (Chatman & Jehn, 1994; Gordon, 1991; Hofstede et al., 1990). Gordon (1991) develops the argument that organisations are founded on industry-based assumptions about customers, competitors, and society, which form the basis of the organisational culture. Organisational values then develop based on these assumptions. Building on earlier work by Hofstede et al. (1990), Chatman and Jehn (1994) identified seven dimensions by which organisational cultures,

within and across industries, can be characterised: innovation, stability, respect for people, outcome orientation, detail orientation, team orientation, and aggressiveness. On all of these dimensions, except outcome orientation, the industry an organisation belongs to accounts for more differences in organisational culture than do variations between firms in the same industry. However, as has been noted, Brodbeck et al. (2004) explained that national culture has a stronger overall influence on organisational culture than industry culture.

3.3.5.2.1 Culture in the ICT Sector

Having discussed the different influences on organisational culture, the next section presents the characteristics of culture within the context of this study, the ICT sector. As Silicon Valley is one of the world's technology centres and the birthplace of a significant proportion of multinational ICT companies, its culture can provide a starting point for the exploration of the ICT sector culture. Harries and Junglas (2013) proposed five dimensions of culture, or contradictory cultural characteristics, that are indicative of the Silicon Valley culture. These are laid back – yet driven for speed, committed – yet independent, competitive – yet cooperative, pragmatic – yet optimistic, and extrinsically motivated – yet intrinsically fulfilled. Silicon Valley companies tend to emphasise getting things done quickly, however imperfectly, instead of agonising over every flaw. As the strategy of many Silicon Valley companies is to bring together the best people for a particular project, the culture also favours independence. Project-based work might entail hiring individuals or retaining them as contractors, rather than enlisting individuals who are in employment at the organisation at that time. Teamwork is another of the cultural dimensions that are important in Silicon Valley. Moreover, the culture seems to embrace failure as part of the process and views it as an opportunity to learn, grow, and improve. The dimension of risk-taking also seems to be central to the Silicon Valley culture. This can be explained by the industry itself which is dynamic and characterised by a rapid pace of innovation. Another characteristic of the Silicon Valley culture is a seemingly contradictory appreciation of extrinsic rewards but a sense of fulfilment reached through intrinsic rewards. To summarise, Harries and Junglas (2013) found that the culture of Silicon Valley was characterised by a desire for change, autonomy, teamwork, risk-taking, and a focus on rewards. This finding is in line with a prior study of the Silicon Valley culture undertaken by Weiss and Delbecq (1987), who described the culture as entrepreneurial, experimental, informal, dynamic, materialistic, and individualistic.

Studies of the ICT sector in other geographic locations proposed similar dimensions as characteristic of the ICT sector culture. In a study of organisational culture in the Malaysian high-tech industry, Naqshbandi, Kaur, Sehgal, and Subramaniam (2015) found that most firms in the electronics and communications industry possessed a highly integrative culture. A highly integrative culture can be described as paying equally high attention to employee development and harmony (in order to facilitate internal integration) and customer orientation, social responsibility, and innovation (in order to facilitate external adaptation). In a comparative study across industries in the Indian context, the most prevalent culture in the IT sector was found to be a clan culture (Gupta, 2011). As discussed in section 3.5, a clan culture is characterised by collaboration. The emphasis is on characteristics such as teamwork, participation, and consensus. In this type of culture, employees are empowered and encouraged to participate in enhancing and optimizing internal resources and business processes. Together, these studies indicate that the ICT sector culture is characterised by a support for change, autonomy, teamwork, and risk-taking.

3.3.5.3 Subsidiary Culture

The previous sections have shown that the local culture of an MNC represents the interaction of industry, corporate, and national contexts. These multiple levels of influence – national, regional, industrial, professional, functional, and corporate – have also been described as “multiple spheres of culture” that interact to form a subsidiary culture (Schneider & Barsoux, 1997). This view is further supported by a study of subsidiaries of global IT firms in Ireland which found that, contrary to the widely held belief that corporate culture dominates in the MNC context, the culture of the Irish subsidiary represents a combination of the corporate culture of the firm, the national culture of the firm's headquarters, the industry culture, and the national culture of the local context (Weisinger & Trauth, 2002). This local subsidiary culture reflects the “nexus of contextual influences” (Weisinger & Trauth, 2002, p. 316). It is this local subsidiary culture which encompasses the locally held norms, values, and beliefs that shape subsidiary managers’ behaviour and decision-making (Williams & Lee, 2011).

3.4 Measurement of Organisational Culture

Throughout the organisational culture literature, there has been an ongoing debate around the question how organisational culture can be measured. Organisational culture has been measured using surveys, questionnaires, and interviews.

O'Reilly, Chatman, and Caldwell (1991) developed the Organizational Culture Profile (OCP), a tool for the quantitative measurement of organisational culture. The OCP combines both the measurement of certain organisational values as well as an individual's preference for these values. This facilitates determining how well a person fits into the target organisation.

Such a quantitative approach is only one way of measuring organisational culture. It has been debated in the literature whether culture can be objectively measured at all or whether it requires interpretation, thereby introducing a subjective element to the analysis (Alvesson, 2002). Schein (1991) outlines three different approaches widely taken to measure organisational culture, a survey research approach, an analytical descriptive approach, and an ethnographic approach. The survey research approach is based on the assumption that organisational culture is indeed something that is measurable through individual questionnaires. However, by taking this view organisational culture and organisational climate become virtually synonymous concepts and Schein raises the question whether the concept of culture is really needed. Also, this approach begs the question whether the focus should be on the common dimensions or on the uniqueness of organisations. The second approach Schein outlines, the analytical descriptive approach, breaks down culture into components that are "empirically more tractable" and these components are then studied individually. Schein highlights that this approach of breaking down culture into its components fragments the concept of culture whose strength lies in drawing attention to the "holistic and systemic aspects of organisational phenomena" (Schein, 1991, p. 244). Lastly, Schein outlines the ethnographic approach which is based on the assumption that deeper levels of culture can only be discovered and understood by intensive and extensive observation combined with interviewing of cultural insiders. This approach views culture as only existent in observable behavioural manifestations shown by members of the culture.

These different approaches to measurement of organisational culture are grounded in different philosophical orientations. There are two distinct types of research, etic research and emic research (Martin, 2002; Sackmann, 1991). When undertaking etic research, the researcher approaches a culture through predefined categories, which he/she will study on the basis of results from previous research. The researcher then predefines the concepts, dimensions, and variables to be studied within a culture, and afterwards develops a questionnaire and quantifies these dimensions and their relations. In emic research, the researcher does not have predefined categories. They are established during the research

itself and based on input from the members of the organisation or the members of the culture explored. These two types of research are linked to distinct research methods. Etic research employs a quantitative research method and a questionnaire is used to measure organisational culture. Whereas, in emic research qualitative methods are mostly used (e.g. observation, discourse analysis).

Used in their pure form, the approaches discussed above are rarely suitable for meeting the goals and objectives of a specific research design. Hence, hybrid research methods are often applied in organisational culture research (Janicijevic, 2011). The aim of using a hybrid methodology is to exploit the advantages and mitigate the disadvantages of the pure methods, but also to adapt a specific research design to the object of the research and the style of the researcher (Creswell, 2009; Martin, 2002). Denison (1996) also provides a strong rationale for the continued integration of quantitative and qualitative methods in organisational culture research. He notes that research into organisational culture has usually been based on social constructionism and used qualitative research methods, while organisational climate was studied using quantitative methods and based on Lewinian field theory. Denison argues that future research into organisational contexts can be best served if the traditions of climate research are incorporated into the culture literature so that lessons of both strands of literature can be applied to further research.

To date, the most comprehensive review of existing instruments for the measurement of organisational culture has been undertaken by Jung et al. (2009). They have identified 70 different instruments for measuring organisational culture. There is, however, no ideal instrument for cultural exploration as the fit depends on the reason for use and the context it is applied in.

Several instruments used to assess culture were reviewed in-depth as they were found particularly suitable for use in this study. These are known and validated instruments that have support in the literature. Details of these instruments will be briefly discussed in the next sections.

3.4.1 Denison Organisational Culture Survey (DOCS)

The Denison Organisational Culture Survey is one of the most prominent commercial packages available for the assessment of organisational culture. It has been developed based on the combination of qualitative and quantitative research methods used to investigate the cultural characteristics of low- and high-performing organisations (Denison, 1984, 1990; Denison & Mishra, 1995; Denison & Neale, 1996; Fey & Denison, 2003).

The cultural traits assessed in the DOCS are:

Adaptability – Adaptability refers to an organisation's ability to understand what the customer wants and the degree to which it can respond to changes in demand. Under the adaptability trait, three indices are further considered. These are creating change, customer focus, and organisational learning. Creating change refers to the organisation's ability to adapt to changing needs, which involves monitoring of the business environment, quick adaptation to changing trends, and the anticipation of future trends. Customer focus describes the importance the organisation places on understanding and anticipating customer needs. Organisational learning relates to the extent to which the organisation uses impulses from its environment and turns them into chances to innovate, learn, and develop.

Mission – Mission refers to an organisation's awareness of its purpose and its future direction. This trait is also further subdivided into three indices. These are strategic direction and intent, goals and objectives, and vision. Strategic direction and intent describes the clarity of the organisation's strategic intention and employees' awareness of it. Goals and objectives should be clearly linked to the organisation's mission and provide employees with a clear sense of direction. Vision refers to a shared view of the organisation's future and is often articulated through statements of core values.

Involvement – Involvement refers to the extent to which organisation members are engaged with the organisation. The three indices measured for this trait are empowerment, team orientation, and capability development. Empowerment describes the authority, initiative, and ability employees have to manage their own work. Team orientation deals with the degree of cooperation that exists between employees in the organisation in order to achieve common organisational goals. Capability development relates to the investment in training and development for employees, so that business needs are met and the organisation remains competitive.

Consistency – Consistency refers to the organisation's systems and processes that underpin the pursuit of efficiency and effectiveness across the organisation. Consistency encompasses the three indices of core values, agreement, coordination and integration. Core values describe the set of values shared between organisation members that creates an identity for the organisation and outlines clear expectations for the organisation's members. Agreement deals with the degree to which conflicts can be resolved constructively and also the overall underlying level of agreement in the organisation. Coordination and integration describes the extent to which different functions of the organisation work together to achieve common goals.

For this study, a number of items have been adopted from the DOCS. These are detailed in Chapter 4.

3.4.2 Assessing the Climate for Creativity (KEYS)

This instrument was designed to assess the perceived stimulants and obstacles to creativity in organisational work environments (Amabile et al., 1996). As creativity is considered a highly important antecedent to innovation (see section 3.2.3), this instrument has also been reviewed. KEYS was constructed on the assumption that the organisational work environment is likely to influence both the generation and development of creative ideas.

The KEYS instrument encompasses 78 items, which employees respond to on a four-point response scale, and is used to quantitatively measure the level of support for creativity in an organisation. The main dimensions that are assessed are:

Organisational Encouragement – Creativity is seen to be enhanced when the organisation fully supports it. This can be achieved by open communication, a shared vision and with an organisational culture that encourages the fair and constructive judgement of ideas, rewards for creative work, and mechanisms for developing new ideas.

Supervisory Encouragement – Managers should not only act in a manner that allows them to serve as role models but they also need to encourage the work of the team and its members. Supervisory encouragement is seen to have a positive effect on the morale of the team. The supervisor supports the team, sets goals appropriately, values team members' contributions, and shows confidence in the team.

Work Group Supports – The composition of teams is crucial to their creative potential. Diversity ensures that a lot of different viewpoints are considered within the team. Team members should also be committed to the team's goals. They should trust and support each other and value individual contributions. New ideas should be challenged constructively.

Sufficient Resources – Time and money are two resources that are important in supporting creativity in an organisation. Organisational members require access to the resources necessary to do their job. Additional resources beyond a certain sufficiency threshold do not yield additional creativity.

Challenging Work – Challenging work describes a sense of having to work hard on challenging tasks and important projects. Should employees feel that their work is too challenging and not achievable, though, this results in a decrease in motivation.

Freedom – Freedom refers to a sense of autonomy that employees have regarding what work to do and how to do it. Autonomy can have a positive effect on creativity as long as it is combined with clear definitions of domains in which the individual can exert creativity. These boundaries reduce the sense of ambiguity employees might otherwise experience.

KEYS also assesses two dimensions that may have a detrimental impact on creativity in the organisation. These are

Organisational impediments – An organisational culture that impedes creativity through internal political problems, harsh criticism of new ideas, destructive internal competition, an avoidance of risk, and an overemphasis of the status quo.

Workload pressure – Extreme time pressures, unrealistic expectations for productivity, and distractions from creative work.

It also includes two measures of how creative and productive the organisation is perceived to be.

Creativity – A creative organisation or unit where a great deal of creativity is called for and where people believe they can actually carry out creative work.

Productivity – An efficient, effective, and productive organisation or unit.

Mathisen and Einarsen (2004) suggest that studies to date have shown that KEYS is a promising instrument for assessing the work environment for creativity. They also caution, however, that a revision of the instrument may be needed in order to improve its factor structure and recommend further studies to ensure the validity of KEYS. Nonetheless, KEYS has found widespread acceptance and has been used in empirical studies (e.g. Bommer & Jalajas, 2002).

Because of the strong link between creativity and innovation (Mathisen & Einarsen, 2004), a number of items from KEYS have been adopted for this study.

3.4.3 Organisational Culture Profile (OCP)

The Organisational Culture Profile was devised to assess the fit between a person and the culture of an organisation and thereby ultimately the person-organisation fit (O'Reilly et al., 1991). It is based on the assumption that organisations have cultures that are more or less appealing to certain types of individuals. For the OCP, organisational culture is conceptualised as values that guide behaviour and are shared throughout the organisation.

The OCP consists of 54 value statements on individual and organisational values. Respondents are asked to sort these statements into categories ranging from least to most characteristic of the organisation. Dimensions include innovation and risk-taking, attention to detail, orientation towards outcomes and results, aggressiveness or competitiveness, supportiveness, emphasis on growth and rewards, as well as collaborative team orientation and decisiveness. Studies, however, often focus on those dimensions that have been yielded from a factor analysis of that study's data (Jung et al., 2009).

Subsequent versions of the measure have been developed and slightly amended, which is reflected in fewer items, different categories and/or the use of a Likert scale. Sarros, Gray & Densten (Sarros, Gray, & Densten, 2003; Sarros, Gray, Densten, & Cooper, 2005) developed a new version of the OCP, which is based on a modified version of the OCP used by Cable and Judge (1997), in which the number of items has been reduced from 54 to 40. They further modified this version by developing a five-point Likert scale for ease of completion of the instrument. Following a factor analysis of this revised OCP, they arrived at a new version that consists of 28 items.

In this modified version of the OCP, the 28 items are categorised into seven different factors with four items per factor. These factors are competitiveness, social responsibility, supportiveness, innovation, emphasis on rewards, performance orientation, and stability. Two new environmental factors that had not been part of the original OCP were identified: social responsibility and stability.

The OCP is a widely accepted measure and has been used in a number of empirical studies (e.g. Tepeci & Bartlett, 2002; Wang, Guidice, Tansky, & Wang, 2010). Together with the previously discussed Denison Organisational Culture Survey, the OCP is one of the most commonly used measures of organisational culture (Schneider, Ehrhart, & Macey, 2013).

3.4.4 Organisational Culture Survey (OCS)

The Organisational Culture Survey was devised on the basis of an extensive literature review, in which van der Post, de Coning, and Smit (1997) identified 114 different dimensions of organisational culture. This survey was developed based on a definition of culture as a “system of shared meaning, the prevailing background fabric of prescriptions and proscriptions for behaviour, the system of beliefs and values and the technology and task of the organisation together with the accepted approaches to these” (van der Post et al., 1997). Following a review of the 114 dimensions of organisational culture, the number of dimensions was reduced down to 15. These 15 dimensions are:

Conflict Resolution – The degree to which the organisation encourages employees to constructively resolve conflicts

Culture Management – The extent to which the organisation actively and deliberately engages in shaping its organisational culture

Customer Orientation – The extent to which the organisation aims to satisfy its customers' needs

Disposition towards Change – The degree to which employees are encouraged to think creatively and innovatively and constantly search for better ways to get the job done

Employee Participation – The degree to which employees perceive themselves to be involved in organisational decision-making

Goal Clarity – The degree to which the organisation creates clear performance expectations and goals

Human Resource Orientation – The extent to which the organisation is perceived to have a high regard for its human resources

Identification with the Organisation – The extent to which employees identify with the organisation and its mission

Locus of Authority – The degree of authority and empowerment that employees have in performing their job

Management Style – The degree to which managers provide direction and support to their subordinates and clearly communicate with them

Organisation Focus – The extent to which the organisation is perceived to focus on its core business activities

Organisation Integration – The degree to which different subunits of the organisations are coordinated and effectively collaborate to achieve overall organisational goals

Performance Orientation – The extent to which employees are individually accountable for clearly defined results and a high level of performance

Reward Orientation – The extent to which rewards are based on performance and not allocated based on non-performance related measures

Task Structure – The degree to which rules and regulations, as well as direct supervision, are used to manage employee behaviour

The survey contains 97 items over the 15 dimensions that are measured on a seven-point Likert scale.

While the data reported on the validity of the OCS is somewhat vague, four studies have used the survey since its development (Denison, Nieminen, & Kotrba, 2014).

3.4.5 Dobni

Dobni (2008) developed a multidimensional culture construct based on exploratory factor analysis. The focus of this construct is solely on the innovation culture of an organisation. In order to assess the innovation culture, four different dimensions of an innovation culture are measured – innovation intention, innovation infrastructure, innovation influence, and innovation implementation. These are then further broken down into different innovation factors. The cultural dimensions and their breakdown is as follows:

i. Innovation Intention

Innovation propensity – Innovation propensity describes the extent to which the organisation has espoused innovation as one of its main goals. This could be done by communicating this focus on innovation through the mission statement or clearly articulated common goals as well as by designing organisational processes to support innovation endeavours.

Organisational constituency – Organisational constituency describes the extent to which employees are engaged in innovation activities in the organisation as well as the employees' individual sense of contribution towards common goals compared to their co-workers.

ii. Innovation Infrastructure

Organisational learning – Organisational learning refers to the degree to which training and development initiatives for employees are aimed at fulfilling innovation goals.

Employee creativity and empowerment – Employee creativity and empowerment refers to the level of creativity in the organisation's employees and the amount of creativity that employees are allowed to use in their work. Empowerment describes the employees' ability to act at will.

iii. Innovation Influence

Market orientation – Market orientation relates to the employees' ability to gather and utilise knowledge on customers, competitors, and the industry as well as the larger context that the organisation operates in.

Value orientation – Value orientation relates to the extent to which employees are engaged in the process of creating value for customers.

iv. Innovation Implementation

Implementation context – Implementation context refers to the ability of the organisation to execute value-added ideas and to adapt to changes in its environment.

Dobni's innovation culture instrument contains 86 items across the scales described above to which a seven-point Likert scale was applied.

This innovation culture survey has been used in a number of studies since its rather recent publication (e.g. Sharifirad & Ataei, 2012) and the reliability of the construct has been established.

3.4.6 Group Practice Culture Questionnaire

The Group Practice Culture Questionnaire was developed to measure the culture of medical group practices (Kralewski, Wingert, & Barbouche, 1996). The instrument is based on 12 dimensions of organisational culture identified by Reynolds (1986). For the Group Practice Culture Questionnaire, culture is conceptualised as shared values and beliefs regarding norms of appropriate organisational behaviour.

In its original version, the Group Practice Culture Questionnaire consisted of 35 items with a five-point Likert scale response option. The 35 items described nine dimensions of organisational culture. These dimensions are innovativeness/risk-taking, group solidarity, cost-effectiveness orientation, organisational formality, emphasis on resource control, centralisation of decision-making, entrepreneurship, physician individuality, and visibility of costs.

A subsequent version of the Group Practice Culture Questionnaire was developed in 2005 (Kralewski, Dowd, Kaissi, Curoe, & Rockwood, 2005). In this revised version 39 items are to be rated on a four-point Likert scale. The nine dimensions of organisational culture that are reflected in this version are collegiality, information emphasis, quality emphasis, organisational identity, cohesiveness, business emphasis, organisational trust, innovativeness, and autonomy.

This measure of organisational culture has been used in medical care settings (Kralewski et al., 2005, 1996), which is the context that it was explicitly developed for. Even though the context of this study differs, some of the items have been adopted for the purposes of this study, because they help to provide a more nuanced look at some of the organisational culture dimensions.

Items from all of the measurement instruments of organisational culture reviewed above have been adopted in order to provide a nuanced look at the dimensions of organisational culture central to this study. The chosen statements used in the questionnaire designed for this study are detailed Table 4.2 in Chapter 4.

3.5 Typologies of Organisational Culture

A number of frameworks or typologies of organisational cultures have been developed over the last thirty years of research in this area.

In their work on organisational culture, Deal and Kennedy (1988) identify four different types of culture: a tough-guy, macho culture, a work hard/play hard culture, a bet-your-company culture, and a process culture. The tough-guy, macho culture is characterised by individuals with a high appetite for risk and quick feedback processes. In contrast, the work hard/play hard culture is rather risk-averse, while still having quick feedback processes. The focus here lies on a high level of activity that is low risk. Although the bet-your-company culture is characterised by a high-risk environment, similar to the tough-guy, macho culture, the feedback processes here are very slow. The core of the process culture is the way that things are done within the organisation. Little to no feedback exists in this type of culture, so the focus is on how things are done more so than what things are done.

Hofstede (1994) identifies six dimensions of an organisational culture by which most of the variation between different organisational cultures can be explained. The six dimensions of organisational culture are process-oriented vs results-oriented, job-oriented vs employee-oriented, professional vs parochial, open system vs closed system, tightly vs loosely controlled cultures and pragmatic vs normative cultures. These dimensions have been briefly discussed earlier in section 3.3.1 but will now be described in more detail. Process-oriented cultures are concerned with following routines while results-oriented cultures are focused on an outcome. A job-oriented culture concentrates on an employee's job performance, with an employee-oriented culture taking a broader approach of looking

at an employee's well-being. In a professional culture organisational members strongly identify with their profession, whereas the focus in a parochial culture lies on identification with the organisation. The fourth dimension, open system vs closed system, describes the nature of internal and external communication and the ease with which outsiders or new members can enter the culture. Tightly and loosely controlled cultures differ in terms of the degree of formality and punctuality displayed in the organisation. Lastly, pragmatic cultures are more flexible in dealing with the external environment compared to normative cultures which are more rigid. This sixth dimension relates to the customer orientation of the organisation.

In their work on organisational culture, Cameron and Quinn (2011) identify four major culture types based on the Competing Values Framework: hierarchy culture, market culture, clan culture, and adhocracy culture. A hierarchy culture is characterised by control and a focus on procedures, rules, and policies. The most important factor is the maintenance of a smoothly running organisation. A market culture is based on transaction cost theory and highly results-oriented. The emphasis here lies on competitiveness, productivity, and market leadership. A clan culture, on the other hand, focuses on collaboration. Factors such as teamwork, participation, and consensus are very important to the organisation. Throughout the organisation, there is an emphasis on loyalty and tradition as well as high levels of commitment. Lastly, an adhocracy culture emphasises creation. The organisation is committed to experimentation and innovation as well as risk-taking. This type of culture describes dynamic, entrepreneurial, and creative organisations. The Competing Values Framework has been widely used in studies on organisational culture (e.g. Deshpandé, Farley, & Webster, 1993; Matzler, Abfalter, Mooradian, & Bailom, 2013; Naranjo-Valencia, Jiménez-Jiménez, & Sanz-Valle, 2011).

Want (2003) presents a typology that distinguishes between two different categories of culture: cultures of shame and cultures of change. Within these two categories, he proposes a number of distinct types. Cultures of shame encompass predatory cultures, frozen cultures, chaotic cultures, political cultures, and bureaucratic cultures. Predatory cultures are those that only react to outside pressures but do not show an internal drive for change, whereas frozen cultures are characterised as being in denial about a need for change and as being highly risk-averse. Chaotic cultures are presented as highly "fragmented and unfocused". Political cultures revolve around internal political bargaining for influence, resources and positions, whereas bureaucratic cultures revolve around rules and regulations. All of these types of cultures are presented as cultures of shame because they

are all seen to be either failing or failed cultures. On the other hand, Want outlines two types of cultures of change: service cultures and new age cultures. A service culture is highly customer-centric, with the customer being the focus of the organisation. Change is actively managed by meeting or exceeding customer needs. New age cultures describe what Want terms “top performing cultures”. Within a new age culture, the focus lies on innovation as well as customers and employees. Want states that this type of culture is most often found in high-tech companies.

The typologies discussed in this section show that there are certain types of cultures that seem more likely to promote innovation than others. These are Want’s (2003) new age culture and Cameron and Quinn’s (2011) adhocracy culture.

3.6 Organisational Culture and Innovation

Research on the dimensions of organisational culture that have an impact on innovation largely falls into the domain of organisational innovativeness research. This stream of research is concerned with the determinants of the innovativeness of an organisation (Wolfe, 1994). It should be noted that there is a difference between the concepts of innovativeness and organisational innovativeness. Innovativeness is often used as a measure of the degree of newness of an innovation, while organisational innovativeness or firm innovativeness describes the propensity of a firm to innovate (Garcia & Calantone, 2002). Previous studies have reported that organisational culture is important in regard to innovation (Amabile et al., 1996; Angle, 2000; Jassawalla & Sashittal, 2002; Kanter, 1984, 1988; McLean, 2005; O’Reilly et al., 1991; van der Panne et al., 2003). The main reason is that an organisation’s culture is instrumental in guiding behaviour and can, therefore, serve to either support or inhibit innovation (Ahmed, 1998). An innovation-supportive culture fosters an organisation-wide recognition of the necessity to innovate (van der Panne et al., 2003). This concept of an innovation-supportive culture – or an innovative culture, as the concepts are used interchangeably in the literature – has been introduced to the literature in the last decade (see section 3.2.5). Jassawalla and Sashittal (2002) define culture as the “social and cognitive environment, the shared view of reality and the collective belief and value systems reflected in a consistent pattern of behaviours among participants” (p. 43). Based on this definition of culture, an innovation-supportive culture is characterised by initiative-taking, creativity, risk-taking, mutual trust, early involvement, receptivity to change, autonomy, collaboration, and feedback-seeking (Jassawalla & Sashittal, 2002). Similarly, Dobni (2008) defines an innovative culture as “a multidimensional context which includes the intention to be innovative, the infrastructure to support innovation,

operational level behaviours necessary to influence a market and value orientation, and the environment to implement innovation” (p. 540). The importance of an innovation-supportive culture becomes apparent when looking at factors that can cause resistance to innovation. Routines tempt employees to solely focus on their own tasks and responsibilities. This singular focus can result in a lack of mutual trust that can have a detrimental effect on cooperation across departments. A mission statement that incorporates the value and importance of innovation to the organisation can positively affect an organisation’s culture (van der Panne et al., 2003). An organisational culture that is strongly supportive of innovation and permeates all levels of the organisation can serve as a constant reminder to employees to embody the desired values and behaviours. It can also encourage employees to search for new ways of dealing with problems, taking risks, and exploring their ideas even when their value is not clear. New ideas can be considered without efforts having to be invested to promote them. Also, creative ideas are seen to transform into innovation in a culture that supports innovation (Miron, Erez, & Naveh, 2004). In fact, organisational culture influences innovation in two ways: Firstly, through the process of socialisation and through basic values, assumptions, and beliefs that become a guide for the desired behaviours and, secondly, by emphasising behaviours characteristic of an innovation-supportive culture such as creativity, risk-taking, freedom, teamwork, communication, and instilling trust and respect (Dobni, 2008). The aspect of internal integration included in Schein’s definition of culture, presented in section 3.3.1, is one of the main functions of organisational culture. Internal integration refers to the socialisation of new members of the organisation, the definition of boundaries, and the creation of a common language and ideology (Schein, 2004). Coordination is another function of organisational culture (Martins & Terblanche, 2003). The coordinating function of organisational culture can be described as creating a competitive advantage, providing a sense-making mechanism with regard to acceptable behaviour and social system stability.

Progressing through the different stages of the innovation process requires organisations to provide an environment that facilitates collaboration among employees and the generation of new ideas while tolerating uncertainties that are an intrinsic part of innovation (Wang et al., 2010). An innovation-supportive culture is found to assist in overcoming the challenging requirements for both control and flexibility (Jassawalla & Sashittal, 2002; Khazanchi et al., 2007). It may, however, seem to be a paradoxical phenomenon because of the co-existence of flexibility and control in the underlying values and practices (Khazanchi et al., 2007).

A large and growing body of literature has discussed different dimensions of organisational culture that can encourage or impede innovation. The focus of most of these studies has been on the dimensions that promote innovation (Mathisen & Einarsen, 2004). Table 3.2 illustrates the wide variety of dimensions that have been identified as either innovation supports or innovation obstacles. While numerous cultural dimensions that can support innovation have been discussed in the literature, a number of them are somewhat consistent across the different studies. These are autonomy (Cantwell, Aiman-Smith, & Mullen, 2007; Miron et al., 2004; O'Reilly et al., 1991), teamwork (Cantwell, Aiman-Smith, & Mullen, 2007), support for change (Cantwell et al., 2007; Jassawalla & Sashittal, 2002), risk-taking (Cantwell et al., 2007; Miron et al., 2004; O'Reilly, 1989; O'Reilly et al., 1991), trust and openness (Ahmed, 1998; Ekvall, 1996; Jassawalla & Sashittal, 2002; Mathisen & Einarsen, 2004), and constructive conflict (Amabile et al., 1996; Jehn, 1995; Pelled, 1996). Miron et al. (2004) also identify tolerance of mistakes and low bureaucracy as prevalent dimensions of innovative cultures. For the purpose of this study, tolerance of mistakes will be considered as part of the risk-taking dimension as these two dimensions are strongly linked. In order to illustrate the effect that certain dimensions of organisational culture have on innovation, literature that refers to creativity will be used alongside the innovation literature. Creativity is commonly defined as the generation of new and useful ideas (Amabile et al., 1996; George, 2007) and is generally viewed as an antecedent of innovation (George, 2007).

Table 3.2: Innovation Supports and Obstacles

Author(s)	Year	Innovation Supports	Innovation Obstacles
Kanter	1984, 1988	Integrative structures, Diversity, Multiple structural linkages, Intersecting territories, Collective pride/faith in people's talents, Collaboration and teamwork	Segmentalism, Management control, Hierarchical structures, Lack of supervisory encouragement
Angle	1989	Organic organisation, Open communication, Power based on expertise, Decentralised decision-making	Mechanistic organisation, Position power, Centralised decision-making
O'Reilly	1989	Risk-taking, Rewards for change, Openness, Common goals, Autonomy, Belief in action	
O'Reilly, Chatman, & Caldwell	1991	Innovation, Risk-taking, Attention to detail, Outcome orientation, People orientation, Team orientation, Aggressiveness, Openness to change	Results orientation, Individual orientation, Stability/resistance to change
Amabile et al.	1996	Organisational encouragement (risk-taking, idea generation, fair & supportive evaluation of new ideas, reward & recognition of creativity, collaborative idea flow across the organisation, participative management & decision-making), Supervisory encouragement (goal clarity, open interaction, support of team's work and ideas), Work group supports (diversity in team members' backgrounds, openness to ideas, constructive challenging of ideas, shared commitment), Freedom/autonomy, Sufficient resources, Challenge	Workload pressure, Organisational impediments
Ekvall	1996	Challenge, Freedom, Idea support, Trust/openness, Dynamism/liveliness, Playfulness/humour, Debates, Conflicts, Risk-taking, Idea time	
Lumpkin & Dess	1996	Entrepreneurial orientation, Autonomy, Innovativeness, Risk-taking, Proactiveness, Competitive aggression	
Arad, Hanson, & Schneider	1997	Use of teams, Information sharing, Decentralisation, Empowerment, Freedom & autonomy, Participative management, Reward of innovative efforts	Centralisation, Standardisation, Control oriented management
Ahmed	1998	Challenge & belief in action, Freedom & risk-taking, Dynamism & future orientation, External orientation, Trust & openness, Cross-functional interaction, Leadership commitment, Rewards	
Jassawalla & Sashittal	2002	Initiative-taking, Creativity, Risk-taking, Inclusiveness, Trust, Openness to change	
Johnston & Bate	2003	Celebration of newness and uniqueness, Appreciation of nonconformity, Tolerance and flexibility, Tolerance for mistakes	

Shalley & Gilson	2004	Risk-taking, Psychological safety, Communication, Conflict, Participation	
Disselkamp	2005	Open channels of communication, Competence and accountability, Awareness of conflicts, Tolerance for mistakes	
McLean	2005	Organisational encouragement (risk-taking, participative decision-making), Supervisory encouragement (open interactions, rewarding accomplishments), Work group encouragement (diversity, creative personalities), Freedom and autonomy, Resources	Control, Group cohesion
Hülshager, Anderson, & Salgado	2009	Diversity, Interdependence, Psychological safety, Participation, Support, Communication, Conflict	
Tellis et al.	2009	Willingness to cannibalise assets, Future orientation, Tolerance for risk, Empowerment of innovation champions, Incentives, Internal autonomy and competition	

3.7 The Research Model

Due to the complex nature of innovation, a more multidimensional view is called for and a number of multidimensional constructs and frameworks have been introduced in more recent years (e.g. Crossan & Apaydin, 2010; Dobni, 2008; Prajogo & McDermott, 2011). The above studies, while providing valuable insights into those linkages between organisational culture and innovation, leave some key research questions unanswered. This study took the organisational culture and innovation literature as a starting point for creating a preliminary framework. This framework addresses some of the weaknesses of previous studies.

The framework is rooted in the assumption that innovation is more likely to occur in organisations which have an enabling and supportive organisational culture and less likely to occur in organisations where either factor is missing. Including all of the dimensions of organisational culture listed in Table 3.2 would lead to an unwieldy complex construct of innovation-supportive culture. Therefore, the framework comprises those dimensions of culture that have emerged from previous studies as key dimensions of an innovation-supportive culture. This simplified model is presented in Figure 3.3. The organisational culture dimensions that are part of the research model are described in the next sections.

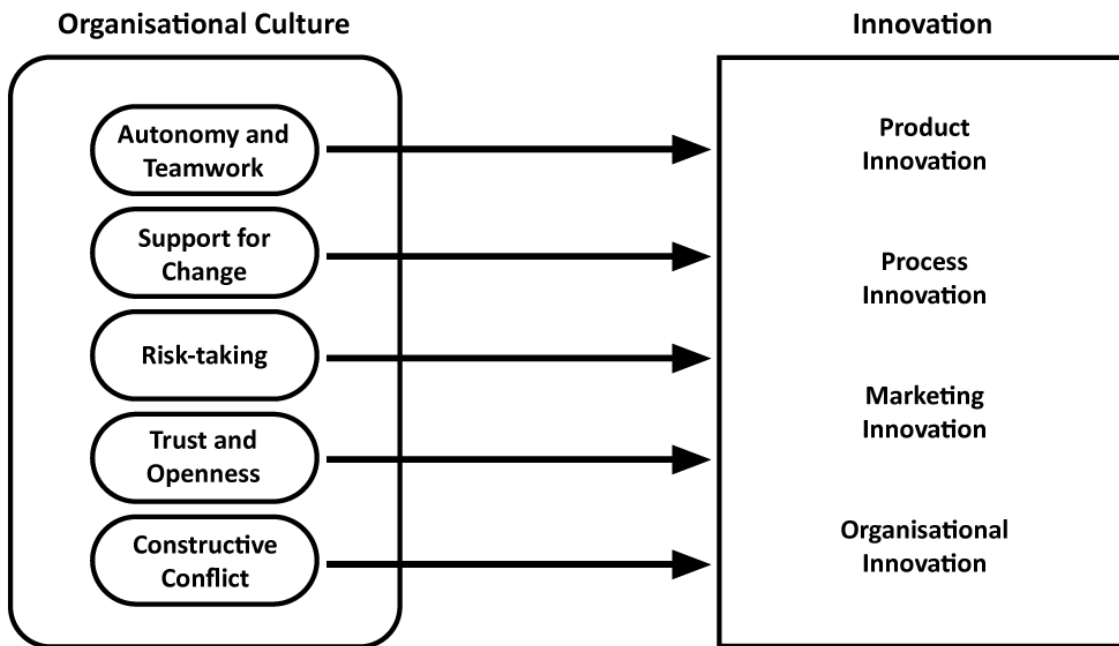


Figure 3.3: The Research Model

3.7.1 Autonomy and Teamwork

Two different aspects of organisational culture have been combined into the dimension of autonomy and teamwork as they represent values that underlie some of the structural facilitators of innovation (Arad et al., 1997).

Both autonomy and teamwork are seen to have a direct impact on innovation. A number of previous studies have found that flexibility and low emphasis on work rules facilitate innovation (Burns & Stalker, 1961; Thompson, 1965; Aiken & Hage, 1971 in Damanpour, 1991; Jassawalla & Sashittal, 2002; Lumpkin & Dess, 1996; Tellis et al., 2009). Participative decision-making is also seen to increase information flow up and down the organisation (Hurley & Hult, 1998; Kanter, 1984). Moreover, it is generally accepted that participatory work environments increase involvement and the commitment to innovate (Thompson, 1965 in Damanpour, 1991). Creativity is fostered when employees have relatively high autonomy in the day to day conduct of their work (Amabile et al., 1996). Empowerment is seen to facilitate proactive behaviour, initiative-taking, and independence (Pieterse, van Knippenberg, Schippers, & Stam, 2010). The freedom for employees to choose which problems to work on and to pursue them independently of directives is also considered one prerequisite of innovation (Baylin, 1985 in Brion, Mothe, & Sabatier, 2012). Cumming (1998) indicated that the freedom to pursue own ideas has a positive effect on idea generation within an organisation, while the existence of an empowered team has a positive effect on the further development of an idea. Similarly, Khazanchi et

al. (2007) found that flexibility values, such as empowerment and experimentation, most directly influence innovation as they encourage employee empowerment and creative freedom. While flexibility values are important for innovation, ambiguity around them increases the importance of control values, which can be documented in policies. Therefore, flexibility and control need to coexist in innovative organisations (Khazanchi et al., 2007). This is also illustrated in Ahmed's (1998) assertion that empowerment needs to be bounded by clear definitions of domains in which the individual can exert creativity. While it seems generally accepted that in order for employees to be creative, they require the freedom to experiment with ideas, autonomy might not have a direct influence on creativity (Dewett, 2004). Rather, autonomy might have an indirect effect on creativity through an increased willingness to take risks (Dewett, 2004).

Teamwork is generally seen to create an atmosphere that can promote innovation (Arad et al., 1997; McDonald, 2002). A team can encourage creativity in its members by emphasising certain characteristics, such as diversity in team members' backgrounds, openness to ideas, constructive challenging of ideas, and shared commitment to a project. Amabile et al. (1996) referred to these characteristics as work group supports of creativity. Team member diversity and openness to ideas can result in a greater variety of ideas being generated and thereby increase the level of creativity within the team. Constructive challenging of ideas and shared commitment to a project can increase the level of employees' intrinsic motivation. This is because both of these factors can lead to a positive sense of challenge in the work (Amabile et al., 1996). Challenge – defined as the degree of emotional involvement in operations and goals of the organisation (Ekvall, 1996) – is also considered one of the dimensions of an innovation-supportive culture. Jassawalla and Sashittal (2002) concluded that fostering teamwork seems to be directly linked to effective new product development. To better understand how teamwork influences innovation in an organisation, Hoegl and Gemuenden (2001) developed the construct of teamwork quality and identified six different facets of teamwork quality: communication, coordination, balance of member contributions, mutual support, effort, and cohesion. Communication describes how the flow of communication and information within teams influences the success of innovative projects. Coordination refers to how teams provide a way of integrating various skill sets needed to perform complex and uncertain tasks successfully. It is also important for success that all team members feel free to bring in their task-relevant expertise as well as cooperate and not compete to achieve a common goal. The effort that team members exert on their common task also influences the success of the innovative project. Lastly, an adequate level of cohesion impacts the performance of

innovation teams through its positive influence on communication and coordination. The usage of the phrase 'adequate level of cohesion' alludes to the fact that conflict might occur in diverse teams. Constructive conflict is seen to have positive effects on idea generation by leading to a great amount and diversity of ideas (Kanter, 1988 in Danneels, 2008). Constructive conflict is also deemed to create an environment of psychological safety (Danneels, 2008), which can encourage experimentation and lessen the fear of failure.

3.7.2 Support for Change

The cultural dimension of support for change encompasses the aspects of belief in action as well as a managerial support for change. These aspects stem from the fact that an organisational culture that emphasises a support for change is generally characterised by a vision that places importance on change, a positive attitude towards change, as well as the support of management, to continuously find new and improved ways of working (Arad et al., 1997; Martins & Terblanche, 2003).

Damanpour (1991) showed that a management's favourable attitude toward change leads to an internal climate conducive to innovation. In their review of research on the determinants of new product performance, Montoya-Weiss and Calantone (1994) found that top management support is one of the most frequently mentioned development process factors in the studies reviewed. A perceived support for change that permeates all levels of the organisation is generally seen to positively influence creativity and innovation (Arad et al., 1997; Martins & Terblanche, 2003). Ekvall (1996) identifies idea support as another important dimension of an innovation-supportive culture. Idea support is defined as the level of receptivity to new ideas and the possibility to try new ideas. When employees perceive their organisation as supportive of creative ideas, they are more likely to perceive the organisational culture as being supportive of innovation and hence to take risks and champion innovation (Gumusluog & Ilsev, 2009). The degree of support and encouragement that an organisation provides its employees to take initiative and explore innovative approaches is also predicted to influence the degree of actual innovation in the organisation (Sarros, Cooper, & Santora, 2008). Baer and Frese (2003) proposed that a culture that underpins a proactive approach toward work tends to encourage a high level of initiative in the workforce.

3.7.3 Risk-Taking

The cultural dimension of risk-taking comprises the aspects of tolerance for mistakes and risk-taking. In order to embrace risk-taking, an atmosphere that accepts mistakes as part of taking the initiative and regards mistakes as learning experiences needs to exist in the organisation (Martins & Terblanche, 2003).

Risk-taking is often framed as tolerance for uncertainty (Ekvall, 1996). Amabile et al. (1996) identified risk-orientation as an important element of the creative process. New ideas can be perceived as risks because they represent disturbances in routines, relationships, power balances, and job security (Dewett, 2004). They also represent a deviation from the status quo. Cumming (1998) found that risk-taking has a positive effect on both idea generation and the successful development of an idea into a usable concept. Risk-taking, therefore, plays a central role in creativity. A fear of potential negative outcomes can hinder creativity, however. As employees do not have a priori knowledge of the outcome of their work, risk is implied because it is unclear if the undertaking will be successful or not (Dewett, 2004). Since the generation and implementation of new ideas are thus inherently risky, they are intimately linked to a possibility of failure. An organisation must therefore also be willing to accept honest failure (McDonald, 2002). In a culture where failure is regarded as an inevitable and even beneficial by-product of exploring new directions, innovation might be more prevalent (Danneels, 2008). This view has also been supported in Cooper, Edgett, and Kleinschmidt's (2004) study, in which they found that the removal of fear of failure is evident in best-performing organisations in order to encourage more innovative and risk-taking behaviour. Similarly, Nystrom, Ramamurthy, and Wilson (2002) concluded that a greater risk orientation is seen to lead to greater innovativeness. Generally, management in an innovative organisation has a more favourable attitude towards risk (Souitaris, 1999).

3.7.4 Trust and Openness

The organisational culture dimension of trust and openness consists of three different attributes: open channels of communication, trust, and psychological safety. These characteristics of the trust and openness dimension are presented in an earlier paper on the culture and climate of innovation (Ahmed, 1998) as well as in the creative climate questionnaire (Ekvall, 1996).

Pallas, Böckermann, Goetz, and Tecklenburg (2013) suggest that open communication is one of four central dimensions of organisational innovativeness. Open communication is

described as the intensity with which an organisation highlights its focus on innovation to all stakeholders. In their research on communication as a determinant of organisational innovation, Kivimäki et al. (2000) distinguish between internal – among employees and work units within the organisation – and external – between the organisation and its environment – communication. External communication with the environment is important to gain awareness of customer requirements and to develop science and technology. However, it should be noted that it is crucial not to divulge information at the early stages of innovation in order to maintain a competitive advantage. A high level of internal communication may contribute to innovation at several points of the development process. It is seen to facilitate the dispersion of ideas within an organisation and to increase their amount and diversity, which in turn results in cross-fertilisation of ideas (Aiken & Hage 1971 in Damanpour, 1991; Kanter, 1988). Effective internal communication may also contribute to success in the problem-solving, experimentation, and implementation stages of innovation (Kivimäki et al., 2000). Ross (1974 in Damanpour, 1991) proposes that it also creates an internal environment favourable to the survival of new ideas. Open communication is further credited with helping to stimulate creativity and to permit more effective cross-functional communication on project teams (Cooper et al., 2004).

Trust is also of importance to innovation. Jassawalla and Sashittal (2003) suggest that innovation-supportive cultures emerge when social interactions generate an environment in which employees share high levels of trust to the extent that it becomes strongly embedded in the collectively held beliefs, assumptions, values, and norms. Ahmed (1998) proposes that where there is high trust, new ideas surface easily. Moreover, trust is seen to enhance “the overall internal receptivity to new ideas and innovation [...] that enables the formation of an innovative culture” (Wang & Ahmed, 2004, p. 205 in Ellonen, Blomqvist, & Puumalainen, 2008). Trust is also positively related to knowledge sharing within and across teams. The expectation that the organisation takes employees’ ideas seriously is positively related to idea implementation (Ellonen et al., 2008). Trust is central to an innovative culture because it enables employees to take risks without fear or undue penalty for failure (Chandler et al., 2000). In their study on trust in the innovation process, Clegg, Unsworth, Epitropaki, and Parker (2002) identified innovation trust as a separate concept. It is defined as the “expectancy of reasonable and positive reactions by others in response to individual innovation attempts” (p. 410). They further distinguish between two different sub-categories of trust: “trust that heard” and “trust that benefit”. “Trust that heard” is the expectancy that the organisation takes employees’ ideas and suggestions seriously, which shows a similarity with Ellonen et al.’s (2008) work mentioned previously. “Trust that

benefit” is described as the expectancy that the organisation’s management has employees’ interests at heart and that employees will share in the benefits of any changes. Clegg et al. (2002) found that “trust that benefit” is associated with the suggestion of ideas, whereas “trust that heard” is associated with the implementation of ideas. This could be due to the fact that employees need to believe that they will benefit in order to make the effort of contributing by suggesting ideas. The link between “trust that heard” and implementation could be explained by the fact that the more an individual feels listened to and taken seriously, the more effort they put into having their suggestions implemented. Linked to trust is the concept of psychological safety. A culture which makes employees feel safe to speak up and take risks seems to complement the adoption and implementation of modern process innovations (Baer & Frese, 2003).

3.7.5 Constructive Conflict

Even though it seems somewhat counterintuitive at first, conflict may be of benefit to innovation (Jehn, 1995; Pelled, 1996). One can distinguish between two different forms of conflict, task conflict and relationship conflict.

Task conflict can be defined as “disagreements among team members about the content of the tasks being performed, including differences in viewpoints, ideas, and opinions” (Jehn, 1995, p. 258). Task conflict has been found to be beneficial for innovation. This is because disagreement about how work is to be performed can result in the generation of new ideas and solutions and improve problem-solving (Shalley & Gilson, 2004). The constructive challenging of ideas is also likely to increase employees’ intrinsic motivation as it gives them a positive sense of challenge in their work (Amabile et al., 1996). Constructive conflict is seen to have positive effects on idea generation by leading to a great amount and diversity of ideas (Kanter, 1988 in Danneels, 2008). It is also deemed to create an environment of psychological safety (Danneels, 2008), which can encourage experimentation and lessen the fear of failure. Managing conflict in teams is crucial because if task conflict exceeds a moderate level, it is found to have a detrimental effect (De Dreu, 2006).

Relationship conflict, on the other hand, describes the presence of personal and emotional tensions in the organisation (Ekvall, 1996). Interpersonal conflict can hinder information processing in the organisation. This is due to conflict undermining the structures of the team by reducing team members’ receptiveness to each other’s ideas (Jehn, 1995; Pelled, 1996). It is therefore important that a high level of conflict – at which groups and

individuals overtly dislike each other – is avoided in an organisation. A culture that guides behaviour around how to handle conflict can, therefore, play a central role in ensuring that the level of conflict in an organisation can be considered constructive (Martins & Terblanche, 2003).

By combining these five dimensions of organisational culture into a model that encompasses the four major forms of innovation (Figure 3.3), the uni-dimensional nature of previous studies – focusing either on a specific dimension of organisational culture and its impact on innovation (e.g. Clegg et al., 2002; De Dreu, 2006; Dewett, 2004; Hoegl & Gemuenden, 2001; Kivimäki et al., 2000) or on a distinct form or magnitude of innovation (e.g. Cooper et al., 2004; Jassawalla & Sashittal, 2002; Khazanchi et al., 2007; Tellis et al., 2009) – is overcome. This uni-dimensionality has been one of the major criticisms of innovation studies (Dobni, 2008; Read, 2000).

3.8 Literature Summary

In conclusion, both organisational culture and innovation have received considerable attention over the last three decades, which has resulted in a growing body of literature investigating the linkages between organisational culture and innovation. Collectively, these studies outline a critical role for organisational culture with regard to innovation. Not only does organisational culture present a means of informal control which becomes especially important in a globally dispersed organisation, but it also has an impact on the overall innovativeness of an organisation. Together these studies provide important insights into how different dimensions of organisational culture impact innovation.

It can be argued that culture is the foundation on which an organisation's innovation efforts are built. There is no universally preferential culture for innovation and no single culture is intrinsically good or bad (Hofstede et al., 1990; Westwood & Low, 2003). A variety of tools to measure organisational culture exist and some that are relevant for assessing the innovation-supportive culture of an organisation have been examined.

In previous studies, a number of organisational culture dimensions have consistently been identified as supportive of innovation. These are autonomy and teamwork, support for change, risk-taking, trust and openness, and constructive conflict. On closer inspection, however, it becomes evident that these previous studies are somewhat fragmented. They tend to be of a uni-dimensional nature, focusing either on a specific dimension of organisational culture and its impact on innovation (e.g. Clegg et al., 2002; De Dreu, 2006;

Dewett, 2004; Hoegl & Gemuenden, 2001; Kivimäki et al., 2000) or on a distinct form or magnitude of innovation (e.g. Cooper et al., 2004; Jassawalla & Sashittal, 2002; Khazanchi et al., 2007; Tellis et al., 2009). Due to the complex nature of innovation, a more comprehensive view is called for and a number of multidimensional constructs and frameworks have been introduced in more recent years (e.g. Crossan & Apaydin, 2010; Dobni, 2008). This study, therefore, set out to apply a multidimensional research model derived from the reviewed literature. This multidimensional approach combined the aspects of organisational culture and innovation with a specific emphasis on five particular dimensions of organisational culture, incorporating the four major forms of innovation.

4 METHODOLOGY

4.1 Introduction

This chapter details the overall methodological approach of this study. It comprises ten sections, each focusing on a specific methodological concern. In section 4.2 the research questions guiding this study are briefly reiterated to situate the methodological discussion. This is followed by a brief discussion of the epistemological assumptions underlying research in the social sciences and an introduction to mixed methods research in section 4.3. Subsequently, section 4.4 focuses on the specific research design chosen, an explanatory sequential mixed methods approach. The appropriateness of a mixed methods approach which provides support for an exploration of culture using a combination of survey-based research and qualitative interviews is briefly described in section 4.5. Sections 4.6 and 4.7 then detail the sampling strategies, data collection processes, and data analysis strategies for each of the two separate phases of the study. This is followed by a brief discussion of the integration of the methods used in section 4.8. Lastly, sections 4.9 and 4.10 discuss the challenges in a mixed methods approach and the measures taken to ensure validity and rigour, respectively.

4.2 Research Questions and Hypotheses

For the first, quantitative phase of this study, the primary research question was

What dimensions of organisational culture predict the number of innovations implemented in multinational subsidiaries in the Irish ICT sector?

Following on from the discussion presented in the literature review, those dimensions of organisational culture that have consistently emerged from previous studies as key dimensions of an innovation-supportive culture have been synthesised into a framework of overarching innovation-supportive culture for the purpose of this study. Previous studies on innovation-supportive culture have largely not considered which of these different cultural dimensions are most related to innovation (Detert, Schroeder, & Mauriel, 2000). Therefore, the following hypothesis is formulated:

H1₀: The more the organisational culture emphasises specific dimensions of an innovative culture, the higher the presence of innovation.

Whereas dimensions of organisational culture that drive innovation have been researched by many authors, one key unanswered research question is whether there are differences in the drivers of innovation by innovation form (e.g. product vs process) (Hauser, Tellis, & Griffin, 2006). As alluded to previously, many prior studies focused on either one form or one magnitude of innovation (e.g. Cooper et al., 2004; Jassawalla & Sashittal, 2002; Khazanchi et al., 2007; Tellis et al., 2009). Taking a more comprehensive view of innovation by investigating product, process, marketing, and organisational innovation, this study aims to address this gap in the literature. It is hypothesised that the relationship of innovation to organisational culture differs for specific forms of innovation:

H2₀: The relationship of innovation to organisational culture differs for specific forms of innovation.

H2_a: Organisational culture has an influence on product innovation.

H2_b: Organisational culture has an influence on process innovation.

H2_c: Organisational culture has an influence on marketing innovation.

H2_d: Organisational culture has an influence on organisational innovation.

As discussed in the previous section, most prior studies have explored the link between innovation and dimensions of organisational culture that encourage innovation whilst distinguishing only between innovative and non-innovative organisations (Damanpour & Wischnevsky, 2006). As innovation is a highly contextual phenomenon it could be argued that it needs to be subject to a finer-grained analysis. Organisations could be very successful in generating innovations while having a weaker capability to implement innovations. On the other hand, they could be in a position where they easily implement innovations but have a lower capability of generating innovations within the organisation and are therefore more dependent on outside sources for innovation inputs. Hence, it could

be hypothesised that the organisational context needed for innovation generation and innovation implementation is somewhat different:

H3₀: Organisational culture has an influence on innovation generation.

For the second, qualitative phase of this study, the research questions were formulated after the completion of the first, quantitative phase of the study and were grounded in the results of the statistical tests from Phase One. The qualitative research questions were:

What are subsidiary management's perceptions of innovation-supportive organisational culture dimensions?

What influences the relationship between organisational culture and innovation in multinational subsidiaries in the Irish ICT sector?

4.3 Epistemological Assumptions

It is important to understand the philosophy of research because the philosophical position taken determines what a researcher considers answerable by science and what he/she will therefore address. The philosophical stance taken also impacts the methods used to address those research questions (Rosenberg, 2012). Most of the discussions around epistemological assumptions that underpin research in the social and behavioural sciences have focused on the postpositivist, constructivist, and pragmatic worldviews. Worldview is defined as “a basic set of beliefs that guide action” (Guba, 1990, p.17 in Creswell, 2009) in line with Creswell's view that the concept of worldview describes a general orientation about the world and the nature of research that a researcher holds (Creswell, 2009, p. 6).

The positivist or postpositivist approach to organisational research builds on natural science as the only legitimate method to be used (Johnson & Onwuegbuzie, 2004; Lee, 1991) and has found widespread application in organisational research. It has been the dominant and relatively unquestioned methodological orientation in the 20th century (Creswell, 2009; Teddlie & Tashakkori, 2009). The positivist approach contends that there is only one truth and considers the observer as separate from the object that he or she observes. It further takes the view that the phenomena under study can be reduced to empirical indicators which represent the truth. Research grounded in the positivist paradigm is associated with quantitative research methods. Traditionally, quantitative research has mostly been concerned with hypothesis and theory testing, standardised data

collection, and statistical analysis (Johnson & Onwuegbuzie, 2004). Sample sizes in quantitative research are much larger than those used in qualitative research to ensure that samples are representative (Sale, Lohfeld, & Brazil, 2002).

The constructivist or interpretivist approach, on the other hand, contends that there is no such thing as objective reality and points to the concept of subjective reality based on different interpretations of reality by different observers (Lee, 1991). These constructions of reality allow for multiple realities to exist. Guba (1990) argues that the observer and the observed cannot be separated because the observer is the only source of reality (Johnson & Onwuegbuzie, 2004). This philosophical orientation with a focus on subjectivity and interpretation is associated with qualitative research methods. Traditionally, qualitative research focuses on hypothesis and theory generation, the researcher as the primary “instrument” for data collection, and qualitative analysis (Johnson & Onwuegbuzie, 2004). Samples in qualitative research are not meant to represent large populations. Small, purposeful samples of informants are used because they can provide important information, not because they are representative of a larger group (Sale et al., 2002).

A pragmatist worldview is typically associated with mixed methods research (Creswell & Plano Clark, 2011) as it allows for a pluralistic methodology. Pragmatism emerged as an alternative to positivist and anti-positivist positions (Wicks & Freeman, 1998). It rejects the categorical distinctions that exist in positivist worldviews and instead focuses on whether or not information is useful for answering a specific research question. Johnson and Onwuegbuzie (2004) advocate the use of pragmatism for its practicality and outcome-orientation as well as its provision of an immediate middle position between the purist approaches, both philosophically and methodologically. By making allowances for the combination of different methodological approaches, pragmatism also offers researchers the opportunity to tailor their research approach to better answer research questions.

Creswell and Plano Clark (2011) identify a fourth paradigm, the participatory worldview, which is listed here for sake of completeness but will not be discussed in detail. This worldview is more often associated with qualitative than quantitative approaches. Its focus is the need to improve society and those in it by taking a change-oriented approach which is also mirrored in the language used by the researcher. A participatory worldview is

concerned with issues such as empowerment, marginalisation, hegemony, and patriarchy. The process of research is of a participatory nature, with the researcher collaborating with the participants in his/her research.

As can be seen from this brief summary the two dominant approaches, the postpositivist and constructivist approaches, are grounded in different philosophical orientations and use opposite, quantitative vs. qualitative, methods of research. These differences in the underlying worldviews have often resulted in the notion that these research approaches are incompatible and gave birth to the concept of 'paradigm debate' or 'paradigm wars'.

Four dominant stances on worldviews and mixed methods research exist: the purist, single paradigm, dialectical, and multiple paradigm stances.

While there is a wide consensus that mixing different types of methods at the level of method is not problematic and can often strengthen a study (Greene & Caracelli, 1997), many authors take a purist stance and advocate the incompatibility thesis, stating that quantitative and qualitative approaches cannot and should not be mixed (Johnson & Onwuegbuzie, 2004). This is mainly argued to be due to fundamental differences between the two underlying paradigms. As qualitative and quantitative research both rely on different assumptions about the nature of reality and the appropriate methods of data collection, they are generally considered to be incommensurate (Morgan, 1998). This supposed link between paradigms and research methods means that research paradigms are associated with research methods in a kind of one-to-one correspondence; if the underlying assumptions of different paradigms conflict with one another, the methods associated with those paradigms cannot be combined (Teddlie & Tashakkori, 2009). It is these differences in paradigmatic assumptions that are usually seen as the reason for issues in combining the two approaches, not the practical application of combining quantitative and qualitative methods in one study (Morgan, 1998). While researchers may choose a specific research approach for its correspondence with their epistemological orientation, that choice does not mean that the use of this approach inevitably implies that epistemological commitment (Bryman, 1996). Teddlie and Tashakkori (2009) point out that this purist stance has largely been discredited as scholars have demonstrated that it is possible to successfully integrate mixed methods into their research projects. The incompatibility thesis has therefore been widely rejected by the mixed methods research community (Teddlie & Tashakkori, 2010).

In contrast, the concept of pragmatism is that qualitative and quantitative methods are compatible. The single paradigm stance based on pragmatism thereby presents an alternative to the either-or choices (either quantitative or qualitative methods) of the incompatibility thesis. Howe (1988) explained that “the compatibility thesis supports the view, beginning to dominate practice, that combining quantitative and qualitative methods is a good thing and denies that such a wedding is epistemologically incorrect” (Teddlie & Tashakkori, 2009, p. 15). The pragmatist does acknowledge the philosophical differences between the different research paradigms but considers them as logically independent and therefore combinable to achieve a research design that is most appropriate for a given research problem (Greene & Caracelli, 1997). Pragmatism does not require paradigmatic differences or contradictions to be resolved before different methodologies are combined in a study. The rationale for mixing methods is the practical demands of the research problem which is of utmost importance to the pragmatist. Researchers grounded in the pragmatic worldview usually take the view that a single paradigm should serve as the foundation for mixed methods research (Teddlie & Tashakkori, 2009).

The third stance, the dialectical stance, recognises the importance of the differences between the philosophical worldviews. Within the dialectical stance, mixed methods research intentionally engages multiple sets of paradigms and their assumptions. In this view, the existing differences should be honoured in ways that maintain the integrity of the disparate paradigms (Greene & Caracelli, 1997). These differences between paradigms should be used within and across studies toward enhanced understandings based on discovery through different worldviews. By taking a dialectical position, methods grounded in both constructivist and postpositivist paradigms can be combined to produce more comprehensive, insightful and logical results than either paradigm could obtain alone. The rationale for mixing methods from a dialectical position is to understand more fully by generating new insights. This contrasts with the pragmatic rationale of understanding more fully by being tailored to the situation and the research problem at hand.

The fourth stance, the multiple paradigm stance, is advocated by Creswell and Plano Clark (2011). Here, in contrast to the single paradigm stance, more than one worldview might be used in a mixed methods study. When compared to the dialectical stance, the multiple worldviews in the multiple paradigm stance relate to the type of mixed methods design used rather than the way the researcher ‘knows’ the world. Creswell and Plano Clark

propose that worldviews can relate to research designs, can change during a study, and may be linked to different phases of a study.

As can be seen from the discussion above, mixed methods research is not linked to one single paradigm, rather it is characterised by paradigm pluralism. Paradigm pluralism describes the belief that a variety of different paradigms may serve as the underlying philosophy for mixed methods research (Teddlie & Tashakkori, 2010). Mixed methods research, therefore, encourages the use of multiple worldviews (Creswell & Plano Clark, 2011, p. 13).

Two reasons for combining quantitative and qualitative research approaches are prevalent in the literature. The first is to achieve triangulation, which can be defined as seeking convergence and corroboration of findings from different methods that examine the same phenomenon (Molina-Azorin, 2012). The second is to achieve complementarity by using the strengths of one method to enhance the other (Morgan, 1998). Whereas the intention of achieving triangulation maintains that research methods are interdependent, taking a complementarity position views them as independent. However, triangulation is often considered an invalid motivation for combining quantitative and qualitative paradigms because the different assumptions underlying the two paradigms result in different phenomena being studied (Sale et al., 2002; Yauch & Steudel, 2003). While the different paradigms might use common labels for the phenomena studied, what the labels refer to is not the same. If the ultimate goal is to study different aspects of the same phenomenon, then combining the two approaches in a complementary manner also is not advisable because – as explained above – the same phenomenon is not being studied by the two approaches. However, complementarity, when defined as the intention of clarifying meaning or more fully explaining results (Yauch & Steudel, 2003), is generally agreed upon as a valid motivation for combining qualitative and quantitative research. More recent discussions have recognised that divergence is as important a result of combining quantitative and qualitative approaches (e.g. Johnson & Onwuegbuzie, 2004; Teddlie & Tashakkori, 2010). The concept of divergence describes the dissimilarity of results yielded from different methods (Molina-Azorin & Cameron, 2015). Divergent results often allow a deeper insight into complex aspects of a phenomenon and can then lead to a more in-depth investigation of those aspects that have not previously been studied. Calls have been made for a more integrative view of the differing research approaches (Miles & Huberman, 1994). An integration of the two approaches should allow answering research questions

beyond those that can be answered by the pure approaches. We are reminded that the "question [...] is not whether the two sorts of data and associated methods can be linked during study design, but whether it should be done, how it will be done, and for what purposes" (Miles & Huberman, 1994, p. 41). Miles and Huberman further explain that "the careful measurement, generalisable samples, experimental control, and statistical tools of good quantitative studies are precious assets. When they are combined with the up-close, deep, credible understanding of complex real-world contexts that characterise good qualitative studies, we have a very powerful mix" (Miles & Huberman, 1994, p. 42).

4.4 Research Design

The method for answering the research questions listed in section 4.2 is encompassed within the overall research design. For the current study, a mixed methods research design has been preferred.

Mixed methods research has been defined as "the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study" (Johnson & Onwuegbuzie, 2004, p. 17). In a 2007 paper, Johnson, Onwuegbuzie, and Turner arrived at the following general definition of mixed methods research after synthesising definitions from 19 thought leaders in the area:

Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration (p. 123).

While these are fairly broad definitions, a narrower definition by Plano Clark (2005) will be used for the purposes of this study. She defines mixed methods research as "research that combines qualitative and quantitative data collection and data analysis within a single study" (Plano Clark, 2005 in Molina-Azorin & Cameron, 2010).

4.4.1 Origins of Mixed Methods Research

Mixed method research emerged as a separate orientation during only the past 20 years (Teddlie & Tashakkori, 2009, p. 7). Its origin is often attributed to psychology and the multitrait-multimethod matrix of Campbell and Fiske (1959). As Creswell (2013) points out, Campbell and Fiske's early approach to mixing different methods was, however,

limited to mixing quantitative methods. Interest then increased in converging or triangulating different quantitative and qualitative data sources (Jick, 1979) and resulted in the development of a distinct methodology (Creswell & Plano Clark, 2011; Teddlie & Tashakkori, 2009). This increased interest has been marked by the emergence of a number of publications, including academic journals, chapters of research texts and research books dedicated to mixed methods research. The most comprehensive publication of mixed methods to date has been the *Handbook of Mixed Methods in Social and Behavioral Research* (Teddlie & Tashakkori, 2010). Practical guides to designing and conducting mixed methods research have also been published (Creswell & Plano Clark, 2011; Teddlie & Tashakkori, 2009). In early 2007, the *Journal of Mixed Methods Research* published its first issue, followed later the same year by the *International Journal of Multiple Research Approaches*. In 2011, the *International Journal of Mixed Methods in Applied Business and Policy Research* was launched.

4.4.2 Characteristics of Mixed Methods Research

Mixed methods research is characterised by a number of distinct features. In their work on mixed methods research, Creswell and Plano Clark (2011) identify six core characteristics: 1. Within a mixed methods study a researcher collects and analyses both qualitative and quantitative data; 2. He or she can then mix the two forms of data concurrently by combining them, sequentially by having one build on the other, or embedding one within the other; 3. Priority can be given to one or both forms of data; 4. The researcher can then use these procedures in a single study or in multiple phases of a program of study; 5. The procedures that are decided upon will also need to be framed within a philosophical worldview and theoretical lens; and 6. These procedures are then combined into a specific research design that directs the plan for conducting the study. Mixed methods research also has a number of unique facets (Teddlie and Tashakkori, 2009). The focus in mixed methods research is on the research question, so the use of whatever methodological tools required to answer that question is advocated. The nature of mixed methods questions is also different to that of purely quantitative or qualitative research. Within a mixed methods study, at least two research questions need to be asked, whereas traditional quantitative or qualitative studies could be initiated with only one question. It is these mixed methods research questions that guide the mixed methods investigation and are answered with information that is presented in both narrative and numerical forms. Mixed methods data analysis then involves the integration of statistical and thematic data analytic techniques as well as other strategies such as data conversion or transformation that are unique to a

mixed methods approach. Data conversion or transformation refers to the conversion of collected quantitative data into narratives or the conversion of qualitative data into numbers. The process of converting qualitative data into numbers that can then be statistically analysed is also called quantitising data, while qualitisising data refers to the process of transforming quantitative data into narratives that can then be analysed qualitatively (Teddlie & Tashakkori, 2009).

Decisions need to be made about the sequence and dominance or priority of the methods used in order to choose the type of mixed methods research design that best answers the research question. The priority or dominance refers to the weighting of the quantitative or qualitative methods for answering the research questions. There are three possible weighting options for a mixed methods study: 1. Equal priority, so that both methods play an equally important role in addressing the research problem; 2. Quantitative priority, with a greater emphasis on the quantitative methods and secondary use of the qualitative methods; and 3. Qualitative priority, where a greater emphasis is placed on the qualitative methods and the quantitative methods are used in a secondary role (Creswell & Plano Clark, 2011). Morgan (1998) points out that the decision about the sequence of the methods used depends on whether the complementary method is intended to be used as preliminary input to the principal method or as a follow-up to the principal method. Other aspects of mixed methods research design are the function of integration (e.g. triangulation, explanation, or exploration), the existence of multiple data strands as well as the decision at what stage of the research process (e.g. research question formulation, data collection, data analysis, or data interpretation) the multiple research strategies actually occur (Bryman, 2006).

4.4.3 Mixed Methods Research Design

The methodology of mixed methods research has been defined as “the broad inquiry logic that guides the selection of specific methods and that is informed by conceptual positions common to mixed methods practitioners (e.g., the rejection of “either-or” choices at all levels of the research process)” (Teddlie & Tashakkori, 2010). This rejection of either-or choices highlights a methodological guiding principle of mixed methods research: methodological eclecticism. Methodological eclecticism refers to the selection and synergistic integration of a myriad of different quantitative, qualitative, and mixed strategies to thoroughly investigate a phenomenon of interest (Teddlie & Tashakkori, 2010).

This study employed an explanatory sequential mixed methods design (Creswell & Plano Clark, 2011), which involved the collection of quantitative data first and then explaining the quantitative results with qualitative data. With this research design, weight is typically given to the first, quantitative phase and the mixing of data occurs when the results from the initial phase inform the data collection in the second, qualitative phase (Creswell, 2009). An explanatory sequential mixed method research design is highly popular among mixed methods researchers (Ivankova, Creswell, & Stick, 2006). In the first, quantitative phase of the study, data on innovation and the different dimensions of organisational culture was collected from a sample of multinational subsidiaries in the Irish ICT sector by means of a self-administered web-based questionnaire. In this first phase, quantitative hypotheses addressed the relationship between innovation and organisational culture in the selected subsidiaries. The second, qualitative phase was conducted to follow up the quantitative results and to help explain and expand on them. In this exploratory follow-up, semi-structured interviews were used to explore the deeper underlying assumptions of the organisational cultures encountered, the perceptions of subsidiary managers of dimensions of an innovation-supportive culture as well as the context in which innovation flourishes or fails. The participants in the second phase were clearly specified once the first, quantitative phase of the study had been completed. This study was designed following the principles laid out by Creswell and Plano Clark (2011), which are shown in Figure 4.1.

Researchers must have a compelling rationale for choosing an overall mixed methods research approach and a specific mixed methods research design. In this study, the i) nature of the research questions and ii) the aims of the research support the use of an explanatory sequential mixed methods research design.

i. Nature of the research questions

A major advantage of mixed methods research is that it enables the simultaneous posing of confirmatory and exploratory questions and therefore allows the verification and generation of theory in the same study (Teddlie & Tashakkori, 2009, p. 33). The first research question – What dimensions of organisational culture predict the number of innovations implemented in multinational subsidiaries in the Irish ICT sector? – can be answered by demonstrating that a particular variable has a predicted effect on another variable. The second set of research questions – 1) What are subsidiary management's perceptions of innovation-supportive organisational culture dimensions? and 2) What influences the relationship between organisational culture and innovation in multinational subsidiaries in the Irish ICT sector? – is exploratory in nature and focuses on how and why

the predicted relationship actually happens. The focus of the research questions, therefore, corresponds with the unique advantage that mixed methods research has.

ii. Aims of the research

An explanatory sequential mixed methods design has been chosen because the different dimensions of organisational culture can be tested with a large sample and a more in-depth exploration of cases can then be undertaken during the qualitative phase. This sequence of research also allows for the quantitative phase to function as a selective device to identify cases (Yauch & Steudel, 2003). The qualitative study helps with evaluating and interpreting the results from the quantitative study (Morgan, 1998). A closed-ended questionnaire and a qualitative interview is the most commonly occurring mixed methods combination (Teddlie & Tashakkori, 2010, p. 240) as this combination allows for the strengths of each strategy to be combined in a complementary manner with the strengths of the other. This research design with a focus on hypothesis testing and statistical analysis during the first, quantitative phase and a focus on exploration during the second, qualitative phase allows the researcher to benefit from complementarity (Greene, Caracelli & Graham, 1989 in Creswell & Plano Clark, 2011) and to develop a richer understanding of the research topic (Johnson & Onwuegbuzie, 2004). There are also a number of other motivations for choosing this research design which have been adopted from Bryman (2006). He identified explanation, context, and illustration as viable motivations for combining quantitative and qualitative research. Explanation, in this case, refers to one type of research being used to help explain the findings of the other. Context refers to the qualitative research providing a contextual understanding that is coupled with generalisable findings or relationships between variables uncovered through the survey. Lastly, illustration refers to the rich description that qualitative research provides when combined with quantitative research. All of these fit with the overall aims of this research.

Figure 4.2 provides a visual model for the mixed-methods sequential explanatory design procedures for this study based on the ten rules for creating visual models laid out by Ivankova et al. (2006). The model portrays the sequence of the research activities in the study, indicates the priority of the quantitative phase, specifies the data collection and analysis procedures, and lists the outcomes from each of the stages of the study.

4.4.4 Epistemological Position

The worldview or paradigm underlying a mixed methods research strategy relates to the type of mixed methods research design chosen (Creswell & Plano Clark, 2011). Creswell

and Plano Clark (2011) advocate the view that more than one worldview can be used as part of a mixed methods study. The selection of these multiple worldviews then relates to the type of mixed methods research design chosen for the study rather than a worldview based on the researcher's understanding of reality. As discussed previously, the use of quantitative methods is usually associated with a positivist worldview. This study, by using a survey in the first phase of the research design, implicitly took a positivist worldview during that phase. This positivist worldview becomes apparent in the focus on specific variables – innovation counts and dimensions of organisational culture – that are measured empirically. This phase of the study was also framed in an a priori theory – that organisational culture does indeed have an impact on innovation in organisations – that was tested in the survey. In the second phase of the study, which consisted of semi-structured interviews to follow up on and explain the survey results, the worldview shifted to a constructivist perspective. During this phase, the focus was on the multiple meanings that participants' answers may have. This phase also aided in arriving at a deeper understanding than the survey alone would have yielded. The interviews also helped with generating a theory or a pattern of responses that explained the survey responses. By applying a sequential approach, the two different paradigms operated as complements by revealing sequential levels of understanding (Hatch & Schultz, 1996). Within a mixed methods study, worldviews can change during the study or, as in this case, be tied to different phases of the study (Creswell & Plano Clark, 2011).

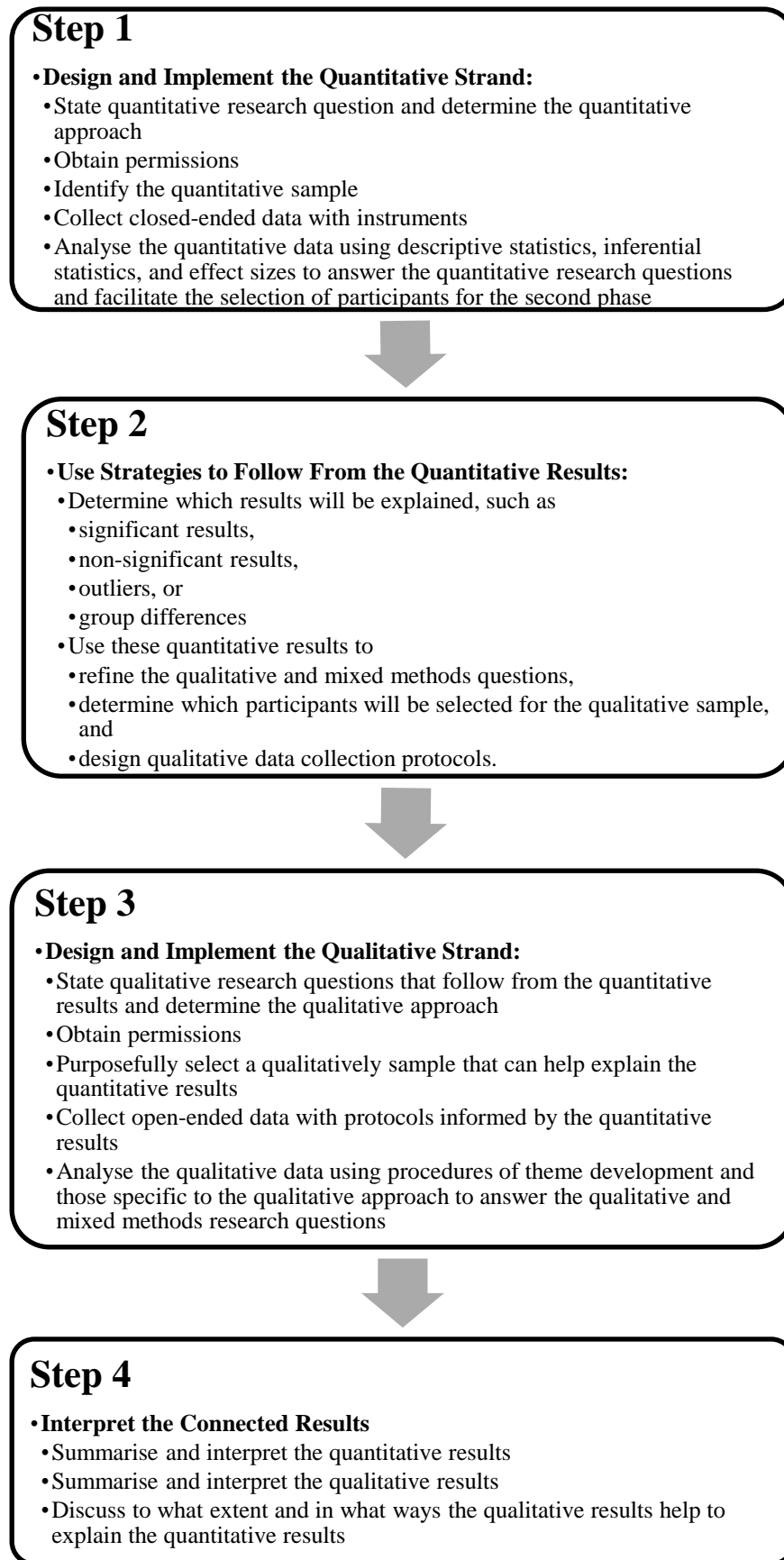


Figure 4.1: Flowchart of the Basic Procedures in Implementing an Explanatory Design. Adapted from (Creswell & Plano Clark, 2011, p. 84)

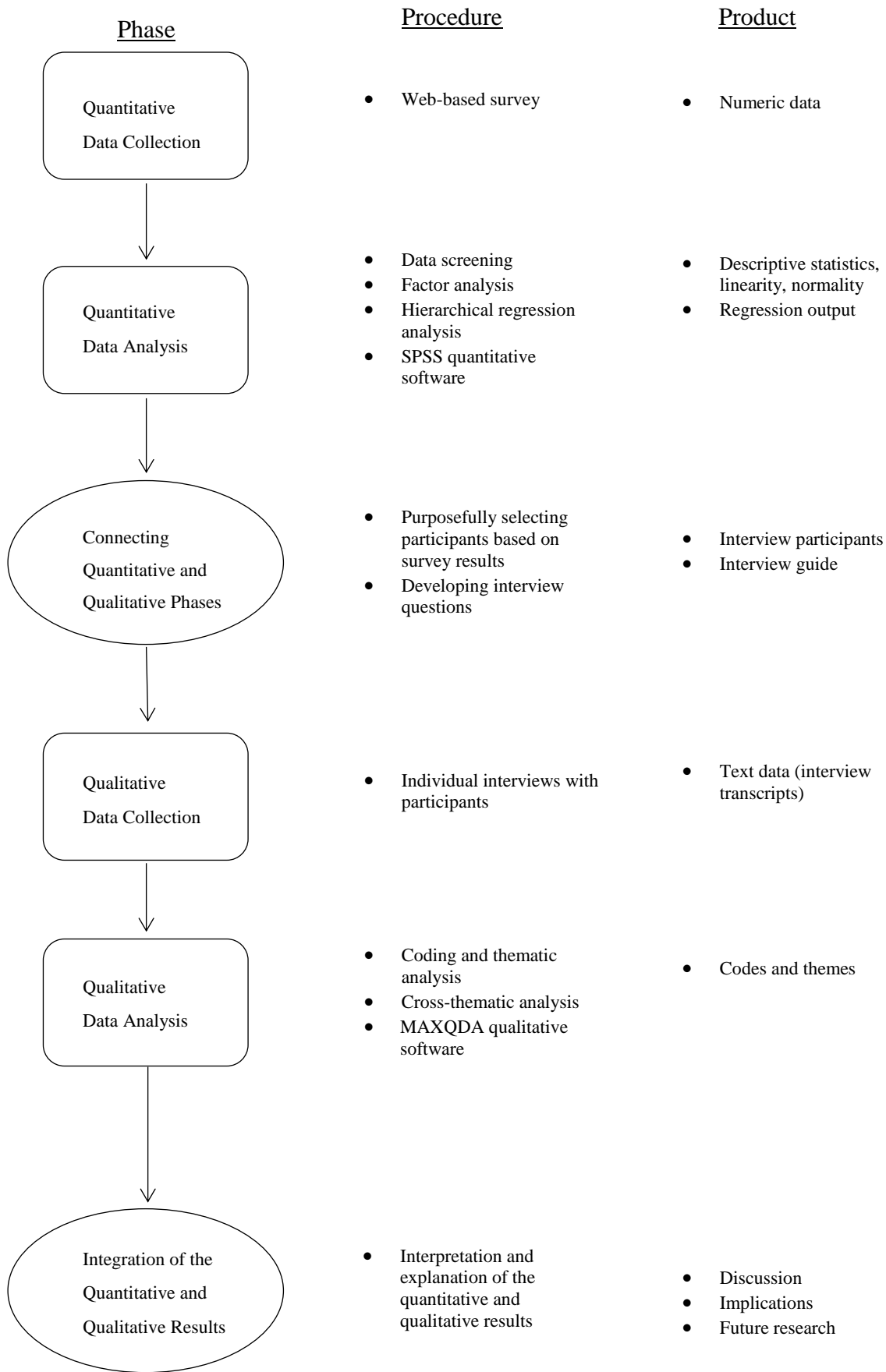


Figure 4.2: Visual Model for the Mixed-Methods Sequential Explanatory Design Procedures. Adapted from (Ivankova et al., 2006)

4.5 Organisational Culture Studies and Mixed Methods Research

Over the last three decades of research on the topic of organisational culture, two distinct methodological approaches have emerged: objectivistic-quantitative, based on a positivist/postpositivist philosophy, and subjectivistic-qualitative, based on a constructivist/interpretivist philosophy. With regard to research on organisational culture, Yauch and Steudel (2003) have identified the particular strengths and weaknesses of the pure approaches. A qualitative approach to organisational culture research allows probing for the deeper underlying values, beliefs and assumptions. This is necessary to understand what is driving the observable behaviour of employees in an organisation. Drawbacks of qualitative research are its time-consuming nature and the possibility of overlooking an important issue due to findings depending on interpretation. On the other hand, a quantitative or survey approach can be administered and evaluated quickly. Its numerical nature also allows for comparison between different organisations and establishing agreement and disagreement between respondents. A purely quantitative approach does, however, raise a serious issue with regard to organisational culture research. It does not allow the investigation of the underlying reasoning behind the answers given in the survey. With regard to Schein's model of culture, quantitative methods can be used to investigate values or artifacts but not assumptions (Yauch & Steudel, 2003). This means that a deeper understanding of culture at the level of assumptions cannot be obtained. For this reason, a mixed methods approach combining both quantitative and qualitative methods emerges as a legitimate choice in organisational culture research methodology (e.g. Janicijevic, 2011; Meissner & Sprenger, 2010). This triangulation of cultural dimensions is seen to decrease bias and increase validity (Yauch & Steudel, 2003).

While a mixed methods approach can require more work and be more time consuming than employing one of the pure approaches (Molina-Azorin & Cameron, 2010), it is an appropriate method for this study because of the complex nature of organisational culture. One source of data could be considered inadequate because "one type of evidence does not tell the entire story" (Creswell & Plano Clark, 2011, p. 8). Therefore, staying within just the quantitative or just the qualitative research paradigm makes it extremely difficult to fully capture organisational culture. A mixed methods approach is considered beneficial because knowledge is seen to accumulate when different methods are used to address the same problem (Creswell & Plano Clark, 2011; Martin, 2002). It can, therefore, be argued that qualitative and quantitative research used together produce more complete knowledge

necessary to inform theory and practice (Johnson & Onwuegbuzie, 2004). Also, the use of different methods draws attention to different aspects of a phenomenon or demonstrates different ways of interpreting the same event (Bryman & Bell, 2007; Johnson & Onwuegbuzie, 2004; Martin, 1990; Yauch & Steudel, 2003). Yauch and Steudel (2003) have also shown that the combination of the qualitative and quantitative paradigm leads to a deeper understanding of organisational culture and enables analysis of the underlying assumptions driving values and behaviours. The combination of a questionnaire and interviews is also recommended by Hofstede et al. (1990). This study is based on Schein's (2004) model of culture. Thus, the main objective of the cultural assessment is to identify values and assumptions that define a consensus within the organisation, thereby adopting Martin's (1992) integration perspective discussed in Chapter 3.

4.6 Phase One: Quantitative

As discussed above, this study consisted of two sequential strands: a quantitative questionnaire strand followed by a qualitative interview strand. The goal of this first, quantitative phase was to identify the potential predictive power of selected dimensions of organisational culture on innovation and to allow for purposefully selecting informants for the second phase of the study.

4.6.1 Participants

The target population was management in multinational subsidiaries in the information and communication technologies (ICT) sector. There were two reasons for choosing management as the focus for this study. Firstly, management is privy to information across a variety of departments and is, therefore, a valuable source for assessment of the overall organisational culture (Baer & Frese, 2003). Moreover, management plays a key role in shaping and sustaining organisational culture. Managers act as role models in expressing the desired attitudes, values and behaviours (Davila et al., 2013; Kane-Urrabazo, 2006; Schein, 2004). Secondly, focusing on the management of an organisation may allow controlling for potential sources of bias. This view is supported by Glick (1985) who refers to a sampling strategy advocated by Seidler (1974) by which the same types of informants are selected in all of the sampled organisations. This is seen to hold the level of bias constant across the organisations and, because knowledgeable informants are selected, is likely to increase the accuracy of the derived measure.

The ICT sector plays a central role in the world economy, the EU economy and the EU's economic recovery, as confirmed by its pervasive impact, its inherent R&D magnitude and

intensity, its innovation performance and global dynamics (Turlea et al., 2010). It is one of the most research-intensive sectors in the EU economy (Lindmark, Turlea, & Ulbrich, 2008; OECD, 2002, 2011a). With a ratio of 5.3% in 2009, the R&D intensity¹ of the ICT sector was more than four times the average ratio of 1.2% in the EU economy (Stancik & Desruelle, 2012). R&D intensity is widely used as an indicator of the innovativeness of an industry (OECD, 2011b). The ICT sector, therefore, lends itself rather well to a study on innovation; the ICT sector in Ireland especially so as it took the leading position in the EU in 2009 with a 6.4% share of total value added to GDP ratio (Stancik & Desruelle, 2012). The ICT sector also presents a unique combination of R&D based innovation as well as organisational innovation (Wintjes & Dunnewijk, 2008).

The strong presence of ICT firms in Ireland has largely been driven by foreign direct investment. This has been a deliberate strategy of the Industrial Development Agency (IDA) with the ICT sector being one of the focus areas for investment promotion (Department of Jobs, Enterprise and Innovation, 2014). In 2013, Ireland attracted FDI inflows of USD 35.5 billion, which makes it one of only two OECD countries in which FDI inflows amount to more than 15% of GDP (OECD, 2014). In the computer and electronic products manufacturing sector, the presence of foreign-owned affiliates in Ireland is especially high (OECD, 2013); Foreign affiliates' shares of computer equipment manufacturing turnover exceed 90% (OECD, 2009). The ICT sector is of vital strategic importance to Ireland due to the number of professionals employed as well as its significant contribution to Ireland's export performance (€70b p.a.) – which represents 40% of the national total (ICT Ireland & ISA, 2013). Information and communication activities together represent almost 12% of Ireland's value added, against an OECD average of 6% (OECD, 2013). Seven of the top 10 US R&D investing companies in computer services and software (Nepelski & Stancik, 2011) have their European regional office in Dublin. This sector has also been chosen based on the researcher's personal

¹ R&D intensity is measured by the ratio of R&D expenditures to value added (VA). Value added is revenues less materials and services purchases.

interest as well as personal experience gained having worked in the sector for a number of years.

In order to compile the list of target companies for the survey, the FAME database was used. FAME provides information on financials, ratios, directors, shareholders and subsidiaries for 2 million companies in the UK and Ireland with summary information for a further 220,000 companies. It includes 4,868 active companies with a primary trading address in Ireland that match the 2006 – 2007 OECD definition of the ICT sector and are owned by an ultimate owner. A number of steps were taken in order to set up the final sample:

Step 1) Review the list of firms extracted from FAME (n = 4,868)

Step 2) Download list of IDA client companies within the ICT sector from the IDA website (n = 127)

Step 3) Cross-reference the two lists to arrive at a list of IDA client companies within the ICT sector parameters as specified by the OECD sector definition (n = 62)

The focus was put on IDA client companies due to their prevalence in the Irish ICT sector. It is likely that IDA client companies can avail of the same type of supports when establishing their subsidiary in Ireland. It is therefore expected that by focusing on IDA client companies the organisational context of the selected sample is more comparable than a random selection of organisations within the wider ICT sector. This should preclude any differences in initial setup to have an effect on the constructs under study. As discussed previously, the ICT sector has been a clear focus of the IDA's policies. Ireland has sustained success in attracting multinational companies which is illustrated by the fact that 2015 marked Microsoft's 30th year and Xilinx's 20th year in Ireland.

The survey invitations were sent to a contact in the HR department in all of the selected subsidiaries with a request to forward the link to one senior manager with knowledge of innovation activities and at least three other employees at different management levels of the organisation to provide as representative a cross-section as possible, a strategy that has also been employed by Baer and Frese (2003). This was done in order to avoid single-rater bias (Gerhart, Wright, McMahan & Snell, 2000) and in line with Martin's (2002) integrationist perspective of organisational culture. Contacts were identified in all of the 62 organisations and a contact database including name, position in the organisation, and email address was created. This was then used to distribute the survey through Qualtrics to

the entire population of subsidiaries (as described above) as it was sufficiently small to do so.

4.6.2 Questionnaire

The source of quantitative data used for this study was the Innovation and Organisational Culture Survey (Appendix A). This questionnaire contained Likert scale statements on five different dimensions of organisational culture, as well as multiple choice questions and continuous data on innovation. It was clearly structured and professionally designed. It had also been pilot studied with directors in ICT firms which helped to minimise problems of misinterpretation or misreading the questions. The sections below describe the design of the survey instrument and the survey itself in more detail.

4.6.3 Preliminary Research

Following an analysis of a review undertaken by Jung et al. (2009) as well as an examination of the wider organisational culture literature, a number of existing instruments had been identified as relevant as described in Chapter 3. The questionnaire scales and items have been developed based on the themes in the literature on innovation and organisational culture and items from the existing instruments identified in Jung et al.'s review (2009).

4.6.4 Structure of Questionnaire

The Innovation and Organisational Culture Survey covered two main topic areas – innovation and organisational culture – which were subdivided into a number of different sections:

- iii. Background/Demographics
- iv. Innovation
 - a. Product Innovation
 - b. Process Innovation
 - c. Marketing Innovation
 - d. Organisational Innovation
- v. Organisational Culture
 - e. Autonomy and Teamwork
 - f. Support for Change
 - g. Risk-Taking

- h. Trust and Openness
- i. Constructive Conflict

4.6.5 Pilot Study

To improve the validity of the survey (Dillman, Smyth, & Christian, 2014), it was pilot tested using a convenience sample of the target population to ensure its suitability. A number of directors of ICT firms in Ireland reviewed the survey with regard to wording, understandability, completeness, and navigation problems.

4.6.6 Survey Procedure

After setting up the sample and completing the pilot study, Dillman's Tailored Design Method (Dillman et al., 2014) was used to conduct the survey. For web-based surveys, this method consists of the initial survey invitation and follow-up contacts:

- Initial Survey Invitation
 - o First, a personalised invitation email including a link to the survey was sent out to all respondents (Appendix B). This initial email served to introduce recipients to the survey and explained why their response was important.
- First Reminder
 - o Three weeks after the initial invitation, a reminder email was sent to those who had not yet responded to the survey. This email explained that a survey invitation had been sent and asked those to respond who had yet to do so.
- Second Reminder
 - o Two weeks after the first reminder, a second reminder was sent to those who had not yet responded. This email only briefly mentioned the purpose of the survey, instead focusing on the importance of the sample member's response.
- Third Reminder
 - o Two weeks after the second reminder, those who had not yet responded received a third reminder. This email stated that they had received a survey invitation two months prior and highlighted the importance of hearing from those who had not yet responded, framing the request to complete the survey as a request for help.
- Final Reminder

- o Two weeks after the third reminder, a final reminder was sent to those who had not yet responded, highlighting that the study was drawing to a close and that there was only a short amount of time left to complete the survey.

4.6.7 Measurement of Variables

The research question in the first, quantitative phase (“*What dimensions of organisational culture predict the number of innovations implemented in multinational subsidiaries in the Irish ICT sector?*”) predetermines a set of variables for this study. This section describes how the variables were measured in this study. They include product innovation, process innovation, marketing innovation, organisational innovation, autonomy and teamwork, support for change, risk-taking, trust and openness, constructive conflict, and the control variables subsidiary size and subsidiary age. To help ensure the survey’s validity all items were adopted from measures that had been used in previous studies.

4.6.7.1 Innovation

Considering the characteristics of product innovation, process innovation, organisational innovation, and marketing innovation, seven items were adopted from the Community Innovation Survey (Eurostat - European Commission, 2010). These items covered the existence, origin, and newness of the different forms of innovation. Four other items were adopted from the Statistics Canada Survey of Innovation and Business Strategy (Statistics Canada, 2012). These items covered the number of innovations or percentage of expenditure on the different forms of innovation. Four further items were adapted from the Statistics Canada Survey of Innovation and Business Strategy covering the number of ideas generated for each of the different forms of innovation. An overview of these items is shown in Table 4.1.

4.6.7.2 Organisational Culture

The different dimensions of organisational culture – autonomy and teamwork, support for change, risk-taking, trust and openness, and constructive conflict – were adopted from a number of instruments used in previous studies. An overview of the items can be seen in Table 4.2. All of the measures use a five-point Likert scale varying from 1 = strongly disagree to 5 = strongly agree. The respondents were asked to indicate their level of agreement with each of the statements. The phrase ‘in our organisation’ was used as a lead-in to every Likert statement, to clearly mark that the measures refer to the organisation as a whole and not to individual behaviours or attitudes.

4.6.7.2.1 Autonomy and Teamwork

Five items from Denison and Neale (1996) were adopted. One item from Amabile et al. (1996) was adopted and reworded to reflect the firm level analysis by changing the focus to the firm level. Two further items were adopted from Krlewski et al. (2005) and reworded to reflect the context they were applied in, i.e. an organisation instead of a medical practice.

4.6.7.2.2 Support for Change

Five items from Denison and Neale (1996) and Amabile et al. (1996) were adopted. Two items from O'Reilly et al. (1991) were adopted and reworded to reflect the style of statements used throughout the questionnaire. One further item was adopted from Van Muijen et al. (1999) and reworded from a question format to a statement format.

4.6.7.2.3 Risk-Taking

Four items from Denison and Neale (1996), Dobni (2008), and Amabile et al. (1996) were adopted. Another item from Amabile et al. (1996) was adopted and slightly reworded to reflect the style of statements used throughout the questionnaire. One further item was adopted from Dobni (2008) and reworded to reflect the firm level analysis instead of the individual level.

4.6.7.2.4 Trust and Openness

Three items from Denison and Neale (1996), Krlewski et al. (2005), and van der Post et al. (1997) were adopted. One further item from Krlewski et al. (2005) was adopted and reworded to reflect the context it was applied in, i.e. an organisation instead of a medical practice. One item was adopted from O'Reilly et al. (1991) and reworded to reflect the style of statements used throughout the questionnaire.

4.6.7.2.5 Constructive Conflict

Two items from Denison and Neale (1996) were adopted. Two items were adopted from O'Reilly et al. (1991) and reworded to reflect the style of statements used throughout the questionnaire. Two further items were adopted from Amabile et al. (1996) and Dobni (2008) and reworded to change from an individual level statement to a firm level statement.

4.6.7.3 Control Variables

Subsidiary size and subsidiary age were considered as control variables.

Subsidiary size. Subsidiary size was directly measured as the number of employees in a subsidiary. The number of employees is the measure of firm size that is used most often in the literature (Camisón-Zornoza, Lapiedra-Alcamí, Segarra-Ciprés, & Boronat-Navarro, 2004). Size is included as a control variable because it might have an impact on innovation (Camisón-Zornoza et al., 2004; Damanpour, 1991, 1992) as well as organisational culture (Baer & Frese, 2003; Fey & Denison, 2003). The detailed classification by size as proposed in the Oslo Manual (OECD/Eurostat, 2005) was adopted and included as part of the survey.

Subsidiary age. Subsidiary age was measured by the number of years since the organisation started trading in Ireland. Based on previous research (e.g. Damanpour, 1991; Fey & Denison, 2003), the age of an organisation might influence both innovation and organisational culture. Respondents were asked to indicate the number of years the subsidiary had been trading in Ireland.

4.6.8 Data Analysis

The questionnaire provided sufficiently valid descriptions about organisations and the values and attitudes of their staff. It was also used to clarify interdependencies between variables and to statistically evaluate any differences of the impact that different dimensions of organisational culture have on innovation. The organisational culture dimensions (autonomy and teamwork, support for change, risk-taking, trust and openness, and constructive conflict) were measured by averaging responses to the number of Likert-scale items under the respective headings. The survey data was then analysed using hierarchical multiple regression analysis, which is the prevalent method adopted in similar studies in the literature reviewed. Hierarchical multiple regression was also deemed appropriate because it allows the analysis of a variance on a response variable that can be explained by predictor variables that are correlated with each other (Pedhazur, 1997). Correlation between the predictor variables is likely to be the case when analysing a number of different dimensions of organisational culture. SPSS software was used to perform the analysis as it directly links in with Qualtrics, which was used to distribute the survey.

Table 4.1: Details of Survey Items – Innovation Section

Item	Origin
Product Innovation	
A product innovation is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics.	Adapted from Eurostat - European Commission (2010),
<ul style="list-style-type: none"> • Product innovations need to be new to your organisation but do not need to be new to the market. 	OECD/Eurostat (2005), Statistics Canada (2012)
<ul style="list-style-type: none"> • Product innovations could have been originally developed by your organisation or by another organisation. 	
During the three years 2011 to 2013, did your organisation introduce...	
New or significantly improved goods?	Adapted from Eurostat - European Commission (2010), Statistics
New or significantly improved services?	Canada (2012)
Who developed these product innovations?	
Mainly your organisation	Adapted from Eurostat - European Commission (2010), Statistics
Mainly your organisation together with other organisations or institutions	Canada (2012)
Mainly other organisations or institutions	
During the three years 2011 to 2013, were any of your organisation’s good or service innovations...	
New to a market? Your organisation introduced a new or significantly improved good or service to one of your markets before your competitors. (It may have already been available in other markets.	Adapted from Eurostat - European Commission (2010), Statistics
Only new to your organisation? Your organisation introduced a new or significantly improved good or service that was already available from your competitors in your market.	Canada (2012)

In 2013, approximately how many ideas for new or significantly improved goods or services did your organisation generate?

Number of ideas for new or significantly improved goods
Number of ideas for new or significantly improved services

Researcher's own development aligned with below question adapted from Statistics Canada Survey of Innovation and Business Strategy

In 2013, approximately how many new or significantly improved goods or services did your organisation introduce into the market?

Number of new or significantly improved goods
Number of new or significantly improved services

Adapted from Statistics Canada (2012)

Process Innovation

A process innovation is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software.

- Process innovations need to be new to your organisation but do not need to be new to the market.
- Process innovations could have been originally developed by your organisation or by another organisation.
- Exclude purely organisational innovations.

Adapted from Eurostat - European Commission (2010), OECD/Eurostat (2005)

During the three years 2011 to 2013, did your organisation introduce...

New or significantly improved methods of producing goods or services?

New or significantly improved logistics, delivery and distribution methods for your inputs, goods or services?

Adapted from Statistics Canada (2012)

New or significantly improved techniques, equipment and software in support activities, such as purchasing, accounting, computing and maintenance?

Who developed these process innovations?

Mainly your organisation

Mainly your organisation together with other organisations or institutions

Mainly other organisations or institutions

In 2013, approximately how many ideas for new or significantly improved processes did your organisation generate?

Number of ideas for new or significantly improved processes

In 2013, approximately how many new or significantly improved processes did your organisation introduce?

Number of new or significantly improved processes

Marketing Innovation

A marketing innovation is the implementation of a new marketing method not previously used by the organisation. It must be part of a new marketing concept or strategy that represents a significant departure from the organisation's existing marketing methods.

- It requires significant changes in product design or packaging, product placement, product promotion or pricing.
- Exclude seasonal, regular and other routine changes in marketing instruments.

Adapted from Statistics Canada (2012)

Researcher's own development aligned with below question adapted from Statistics Canada Survey of Innovation and Business Strategy

Adapted from Statistics Canada (2012)

Adapted from Eurostat - European Commission (2010), OECD/Eurostat (2005), Statistics Canada (2012)

During the three years 2011 to 2013, did your organisation introduce...

Significant changes to product design and packaging? (exclude changes that alter the product's functional or user characteristics as those are product innovations)

New methods for goods or service placement or sales channels? (e.g. introduction for the first time of a franchising system, of direct selling or exclusive retailing, and of product licensing, etc.)

Adapted from Eurostat - European Commission (2010), Statistics Canada (2012)

New media or techniques for goods or service promotion? (e.g. product placement in movies or television programmes, use of celebrity endorsements, new branding, etc.)

New methods of pricing goods or services? (e.g. first-time use of variable pricing by demand, discount systems, etc.)

Who developed these marketing innovations?

Mainly your organisation

Mainly your organisation together with other organisations or institutions

Mainly other organisations or institutions

Researcher's own development aligned with question on source of other forms of innovation adapted from Statistics Canada Survey of Innovation and Business Strategy

In 2013, approximately how many ideas for new marketing methods did your organisation generate?

Researcher's own development aligned with questions on other forms of innovation adapted from Statistics Canada Survey of Innovation and Business Strategy

Number of ideas for new marketing methods

For 2013, please estimate the percentage of marketing expenses that were assigned to marketing innovations.

Adapted from Statistics Canada (2012)

Organisational Innovation

An organisational innovation is the implementation of a new organisational method in the firm's business practices, workplace organisation or external relations that has not been used before in the organisation.

- It must be the result of strategic actions taken by management.
- Exclude mergers and acquisitions, even if for the first time.

During the three years 2011 to 2013, did your organisation introduce...

New business practices for organising procedures? (e.g. first implementation of education/training systems, supply chain management systems, business reengineering, lean production, and quality management systems, etc.)

Adapted from Eurostat - European Commission (2010), Statistics Canada (2012)

New methods of organising work responsibilities and decision making? (e.g. centralisation, decentralisation, team work, integration of departments, etc.)

Adapted from Eurostat - European Commission (2010), Statistics Canada (2012)

New methods of organising external relations with other firms or public institutions? (e.g. first use of alliances, partnerships, outsourcing, subcontracting, etc.)

Who developed these organisational innovations?

Mainly your organisation

Mainly your organisation together with other organisations or institutions

Mainly other organisations or institutions

Researcher's own development aligned with question on source of other forms of innovation adapted from Statistics Canada Survey of Innovation and Business Strategy

In 2013, approximately how many ideas for of the abovementioned organisational innovations did your organisation generate?

Researcher's own development aligned with below question adapted from Statistics Canada Survey of Innovation and Business Strategy

Number of ideas for organisational innovations

In 2013, approximately how many of the abovementioned organisational innovations did your organisation introduce?

Adapted from Statistics Canada (2012)

Number of organisational innovations

Researcher's own development

Table 4.2: Details of Survey Items – Organisational Culture Section

Meta-Theme	Dimension	Schein Cultural		Origin
		Level	Item(s)	
Autonomy and Teamwork	Autonomy	Value	There is a great deal of tolerance of individual working styles.	Adapted from Krlewski et al. (2005)
		Value	We have the freedom to decide how we are going to carry out our projects.	Adapted from Amabile et al. (1996)
	Participative decision making	Value	Our decision-making process can best be described as consensus building.	Adapted from Krlewski et al. (2005)
		Value	Business planning is ongoing and involves everyone in the process to some degree.	Denison et al. (2003), Denison & Neale (1996)
	Teamwork	Value	People work like they are part of a team.	Denison et al. (2003), Denison & Neale (1996)
		Value	We actively encourage cooperation across different parts of the organisation.	Denison et al. (2003), Denison & Neale (1996)
		Value	Teamwork is used to get work done, rather than hierarchy.	Denison et al. (2003), Denison & Neale (1996)
		Value	Teams are our primary building blocks.	Denison et al. (2003), Denison & Neale (1996)

Support for Change	Support for change	Value	New ideas are encouraged.	Amabile et al. (1996)
		Value	We are willing to experiment.	Adapted from O'Reilly et al. (1991)
		Value	The way things are done is very flexible and easy to change.	Denison et al. (2003), Denison & Neale (1996)
		Value	New and improved ways to do work are continually adopted.	Denison et al. (2003), Denison & Neale (1996)
	Belief in action	Value	Attempts to create change usually meet with resistance.	Denison et al. (2003), Denison & Neale (1996)
		Value	Everyone believes that he or she can have a positive impact.	Denison et al. (2003), Denison & Neale (1996)
		Value	We are quick to take advantage of opportunities.	Adapted from Sarros et al. (2003)
		Value	We often search for new opportunities in the external environment.	Adapted from Van Muijen et al. (1999)
Trust and Openness	Trust	Value	There is a high degree of organisational trust.	Kralewski et al. (2005)
		Value	Our compensation formula is well aligned with our organisation's goals.	Adapted from Kralewski et al. (2005)

	Psychological safety	Value	Differing views are encouraged.	van der Post et al. (1997)
	Open channels of communication	Value	We freely share information around the organisation.	Adapted from Sarros et al. (2003)
		Value	Information is widely shared so that everyone can get the information he or she needs when it's needed.	Denison et al. (2003), Denison & Neale (1996)
Constructive Conflict	Constructive conflict	Value	When disagreements occur, we work hard to achieve win-win situations.	Denison et al. (2003), Denison & Neale (1996)
		Value	It is easy to reach consensus, even on difficult issues.	Denison et al. (2003), Denison & Neale (1996)
		Value	We are encouraged to challenge decisions and actions if we think there is a better way.	Adapted from Dobni (2008)
		Value	We challenge each other's ideas in a constructive way.	Adapted from Amabile et al. (1996)
		Value	We directly confront conflict.	Adapted from O'Reilly et al. (1991)
		Value	Everyone takes responsibility for his/her own actions.	Adapted from Sarros et al. (2003)

Researcher's own development

4.7 Phase Two: Qualitative

With regard to Schein's model of culture (2004), a questionnaire can be used to investigate values but not assumptions. Hence, the questionnaire was followed up by a series of interviews. The first phase of the research, the quantitative phase, was conducted to inform the second phase, the qualitative phase.

4.7.1 Participants

In mixed methods sequential designs, the quantitative and qualitative phases are connected in the intermediate stage when the results of the data analysis in the first phase of the study inform or guide the data collection in the second phase. Within this specific sequential explanatory design, the two phases were connected while the selection of the participants for the qualitative follow-up analysis based on the quantitative results from the first phase took place (Creswell, 2011). Only participants that took part in the first, quantitative phase were recruited for data collection in the second, qualitative phase. Once the first phase of the study was completed, it was decided which participants to follow up with and what results needed to be explained. Creswell and Plano Clark (2011) list a number of different options for participant selection. The different options that were assessed were as follows:

- Participants who are typical or representative of different groups, which would allow seeing how different groups that have potentially been identified in the quantitative results differ. Quantitative analyses of typical scores or trends within different groups would be employed in this case.
- Participants who scored at extreme levels outside the norm. In order to identify these participants, outliers would need to be determined.
- Participants from groups that might have differed in statistical results.
- Participants who differed in their scores on significant predictors.

Congruent with an explanatory sequential mixed methods design, the participants for interview in Phase Two were selected from the respondents to the subsidiary survey. Although the overall approach of sample selection was purposive, within this framework a modified random selection procedure was employed to select interviewees. In order to select participants for interview, the range and distribution of scores on the total number of innovations variable were inspected. The scores on the total number of innovations variable were used as a basis for selecting subsidiaries as it was one of the main outcome variables in Phase One. The total number of innovations was categorised as low (0 – 25),

medium (25 – 50), and high (51 – 70) and the proportion of the sample in each category was computed. 56% of respondents fell within the low total innovation category, 22% within the medium category, and 22% within the high category. These proportions were used as the basis for interview selection. Two subsidiaries were randomly selected from the low category (60%), one from the medium innovation category (20%) and one from the high innovation category (20%). This choice of subsidiaries represents the proportionate distribution of the number of total innovations amongst the subsidiary sample as a whole. An additional subsidiary was selected from each category to be held in reserve in case they were needed for data saturation.

4.7.2 Data Collection

There are several established qualitative research methodologies and consequently several methods of data collection. Qualitative data can be collected through interviews, observations, and documents or as Wolcott (1992) states through asking, watching, and reviewing. In this study, narrative data was collected through individual in-depth interviews with management to establish the key values and behaviours with regard to innovation within the organisation. The interviews were grounded in the content of the questionnaire items and provided interpretive resources for understanding the results of the quantitative research. Interviews can provide in-depth views of a culture and present a 'thick description'. As Schein (1985) states “[b]ecause culture is unconscious and self-evident to those who work within it, it cannot be studied with compulsive methods, such as questionnaire forms. To reach the underlying assumptions, one has to observe and interview.” The use of mixed methods, therefore, creates a deeper understanding of the organisation and allows establishing the underlying reasons for the identified values (Yauch & Steudel, 2003).

4.7.3 Interviews

An interview can be defined as “a process in which a researcher and participant engage in a conversation focused on questions related to a research study” (DeMarrais, 2004, p. 55 in Merriam, 2009). A qualitative research interview can be defined as “an interview, whose purpose is to gather descriptions of the life-world of the interviewee with respect to interpretation of the meaning of the described phenomena” (Kvale, 1983, p. 174 in King, 2004, p. 11). Qualitative research interviews generally have the following characteristics: a low degree of structure imposed by the interviewer; a preponderance of open questions; and a focus on “specific situations and action sequences in the world of the interviewee”

(Kvale, 1983, p. 176 in King, 2004). Interviewing has a strong claim to being the most widely used qualitative research method (King, 2004). A range of approaches to interviewing exist which differ in terms of breadth and focus (Rubin & Rubin, 2012).

King (2004) identifies three different approaches to interviews: realist, phenomenological, and social constructionist. The approach taken in this study was a realist approach. By taking a realist approach, the participants' accounts were seen as providing a 'real' representation of their experiences beyond the interview situation. Interviews grounded in the realist assumption are often used in conjunction with quantitative survey data in order to benefit from triangulation. Realist interviews also tend to be more structured in nature than phenomenological or social constructionist interviews.

Merriam (2009) and Gibson and Brown (2009) provide a typology of qualitative interviews based on the degree of structure or standardisation imposed by the interviewer. Interviews can take one of three different forms: highly structured, semi-structured, or unstructured (Merriam, 2009). This study used semi-structured interviews to collect data. A semi-structured interview is a valuable exploratory tool and involves a set of predetermined but open-ended questions. Semi-structured interviews allow flexibility to the situation at hand, to the emerging worldview of the participant, and to new ideas on the topic (Merriam, 2009). The researcher can also be more flexible in the way the interview schedule is used (Merriam, 2009). These characteristics of semi-structured interviews are considered important with regard to the complex nature of organisational culture and innovation and the goal of the interviews to explore in-depth the organisational cultures under investigation as well as any influences that existed on the relationship of organisational culture and innovation. Semi-structured interviews were also considered appropriate for this phase of the study because specific data was required from all participants in order to allow for comparison across cases. In addition, Fielding and Thomas (2008) suggest that semi- or unstructured interviews are especially useful when the research topic is complex as is the case in this study. Similarly, King (2004) states that a qualitative research interview is ideal for the exploration of topics in which different levels of meaning need to be explored. Rubin and Rubin (2012) outline the process of conducting semi-structured research interviews which includes developing the interview guide, conducting the interview, and analysing the interview data. This process will now be discussed in the context of this study.

4.7.4 Developing and Piloting the Interview Guide

An interview guide lists the topics that the interviewer will explore in the course of the interview and suggests probes which may be used to follow up on answers and in order to elicit further details from the interview participants (King, 2004). The development of an interview guide – a form of pre-instrumentation – allows not only for easier manageability of the data collection process but also emphasises two important aspects: internal validity (by getting a comparably measured response from different people) and generalisability (Miles & Huberman, 1994). The use of an interview guide also makes interviewing a number of different participants more systematic and comprehensive by delimiting in advance the issues to be explored (Patton, 2002). The topic guide used for interviews in this study was informed by several sources including the study's research questions and overall aims, the literature review, and the data collected from subsidiaries in Phase One (Appendix C). The interview guide was designed by transforming issues identified in the analysis of the quantitative data from the first, quantitative phase into questions, which served to investigate the attitudes of the participants on given topics in depth. The questions focused on three areas central to the study – the organisational culture of the subsidiary, innovation within the subsidiary, including the attitude towards innovation as well as innovation supports and processes, and the position of the subsidiary within the MNC network, including the existence of a mandate for innovation and the scope of innovation in the subsidiary. The interview guide was composed of broad, guiding questions related to these three areas, and was designed to gather descriptive responses and stories from participants. These guiding questions were supplemented and supported by prompts and probes when appropriate to encourage participants to expand upon an answer.

Once the interview guide had been developed, a pilot study was conducted. The pilot study served two purposes. It allowed the interviewer to assess the comprehensiveness of the interview guide and facilitated identification of any difficulties with the interview process itself. The participant interviewed in the pilot study was selected using a convenience sampling technique. The participant was a former manager in a multinational subsidiary in the Irish ICT sector. No issues were identified in the pilot study and consequently, no changes were made to the interview guide or process. The pilot interview lasted 50 minutes, providing an indication of the potential duration of subsequent interviews.

4.7.5 Negotiating the Interview

Once selected, the potential interviewees were contacted by email (Appendix D). All persons that were contacted agreed to be interviewed for the study. Reaching out via email provided the researcher with the opportunity to reiterate the information provided at the outset of the study. This allowed the contact person in the subsidiary to reflect upon this information, and consider any questions or reservations they may have in advance of the interview. Participants were reminded of the following points in the interview invitation email:

- The purpose of the study.
- The parameters of the interview. Invited participants were informed of the main topic areas of the interview.
- Practical aspects of the interview process, including the estimated duration of the interview, choice of interview venue, and confidentiality of interview.

Preparing interview participants in advance addresses both pragmatic and ethical dimensions (Gillham, 2005). It provides interview participants with an opportunity to reflect on whether or not they agree to provide information on the topic, and a chance to reflect on what they might say and prepare themselves. An interview participant's clear understanding of what they are being asked to do, and how the information they share will be treated, are fundamental in setting the tone of the interview and subsequently influences the confidence and frankness of the respondent. When the potential interviewees indicated their interest in participating in the interview, an appointment was made to conduct the interview at a time and place of their convenience.

Two of the four participants requested that they be interviewed online; two requested that the interview be conducted in person on site. Participants were given a phone number on which to contact the researcher should they need to cancel or reschedule the interview, or if they had any questions they wanted to discuss in advance of conducting the interview.

4.7.6 Preparing for the Interview

To prepare for each individual interview the data returned from the subsidiaries in Phase One was thoroughly reviewed. This was done to ensure that the researcher was familiar with the data the participant's organisation had already provided to avoid asking for

information twice. It also allowed the researcher to identify aspects of the survey data that required clarification.

4.7.7 Conducting the Interview

Clear explanations about what to expect as part of the interview can ease the interview process (Patton, 2002). Before conducting the interview, participants were reminded of the topic areas to be covered, the format, purpose, and need to record the interview (Appendix E). The importance of understanding the complexities of organisational culture and innovation at a subsidiary level was emphasised. The procedure for handling the interview recordings and transcripts was reiterated. Finally, participants' questions were addressed and written consent for participation was obtained.

The timeframe that interviewees had been given based on the pilot held true for the remainder of the interviews. The interviews explored issues of strategic importance to the subsidiaries. In conducting the interviews, the researcher was mindful that she was being given sensitive information about the processes in the subsidiary and the wider MNC, and was constantly aware of the ethical responsibility she had to interviewees in the study.

4.7.8 Management of Interview Data

Online interviews were recorded using the recording functionality of Zoom Online Meetings or Skype, whereas interviews that were conducted in person were recorded using a voice recorder. Audio recordings were saved onto a computer and transcribed verbatim. The transcriptions were undertaken by another person but prior to analysis each transcript was reviewed to check for quality and to correct mistakes. There were occasions where re-listening to the recordings enabled the researcher to fill incomplete sections where the transcriber could not interpret.

4.7.9 Data Analysis

Braun and Clarke (2006) propose that qualitative analytic methods can be divided into two camps: 1) those that are tied to a specific theoretical or epistemological position where there is limited flexibility in how the method is applied within the selected framework (for example, conversation analysis and interpretive phenomenological analysis), including those where there are different manifestations of the method from within the broad theoretical framework (for example, grounded theory, discourse analysis, or narrative

analysis); and 2) those methods that are essentially independent of theory and epistemology and can be applied across a range of qualitative approaches. Thematic analysis is positioned in this second camp.

Thematic analysis is a common general analytical strategy for qualitative data which facilitates the search for patterns within the data set. It is defined as “a data reduction and analysis technique by which qualitative data are segmented, categorised, summarised, and reconstructed in a way that captures the important concepts within a data set” (Ayres, 2008, p. 867). In their landmark paper on thematic analysis, Braun and Clarke (2006) define thematic analysis as “a method for identifying analysing, and reporting patterns (themes) within data”. They further identify six phases of thematic analysis: 1) familiarising with the data, 2) generating initial codes, 3) searching for themes, 4) reviewing themes, 5) refining and naming themes, and 6) producing the report. Thematic analysis was considered an appropriate approach to analysing the interview transcripts in this study as it provides a flexible and useful research tool that does not rely on the specialised procedures of other means of qualitative analysis, and can be applied across a range of theoretical and epistemological approaches (Braun & Clarke, 2006). This study used the form of thematic analysis described by Braun and Clarke (2006), which involved the six phases listed above. Qualitative data for the study consisted of transcribed interviews. Data cleaning was undertaken to remove identifiers and care was taken to select quotes where it was not possible to identify participants.

4.7.9.1 Familiarising with the Data

As the researcher collected the data herself, she had some prior knowledge of it and some initial thoughts. The first phase of thematic analysis involved immersion of the researcher in the data to the extent that she was “familiar with the depth and the breadth of the content” (Braun & Clarke, 2006, p. 87). This was achieved through multiple reads of the data whilst searching for patterns. The audio recordings of the individual interviews were also listened to. Initially, the researcher read through all transcripts and notes, making notes as to the general themes and comments on the entire data set (all four interviews). This was followed by the repeated study of the transcript of each individual interview where impressions and ideas were noted and compared with those from the entire data set.

4.7.9.2 Generating Initial Codes

In the second phase of the analysis, the researcher generated initial codes from the data. In qualitative data analysis, codes are used to identify segments or passages of text, assigning symbolic meaning to the descriptive or inferential information (Miles, Huberman, & Saldana, 2013). Transcripts were reviewed line by line and text labels were attached beside each segment. At this stage of open coding, the major categories were freely generated and referred to general descriptors of the data. Transcripts were re-read and as many headings as necessary were written down to describe all aspects of the content. Taking interview transcripts as the primary source of data, with each code representing a label for participants' comments, the coding process contributed to the rigour of the analysis by constituting an audit trail linking the raw data with the emerging categories. Codes were categorised according to their area of focus and these categories were then explored separately to identify sub-themes that related to each focal area.

In order to organise, store, and retrieve data the researcher used the qualitative data analysis software MAXQDA. MAXQDA provided a reliable tool to illustrate the reduced data in a compressed and accessible way and facilitated the process of data display. The use of a software program to code qualitative data is usually more complex and more detailed than manual thematic sorting and so often leads to greater insight in itself (Bazeley, 2009). The use of computer-assisted qualitative data analysis software has a number of advantages; it allows for quick and easy access to data, can handle large amounts of data and facilitates consistency in coding (Bazeley, 2009).

4.7.9.3 Searching for, Reviewing, and Defining and Naming Themes

Once all the interview transcripts were coded and collated the third phase of data analysis, which involved the search for broad themes, was undertaken. Braun and Clarke (2006, p. 82) propose that a theme captures “something important about the data in relation to the research question, and represents some level of patterned response or meaning within the data set”. Sub-themes were reviewed in the context of the overall data corpus, and overarching themes identified. Interview transcripts were re-read along the finalised list of categories and sub-categories to ensure that the codes comprehensively covered all aspects of the interviews. Adjustments were made as necessary. Categories were subdivided into subcategories; for example, ‘Types of Organisational Culture’ was divided into ‘innovative culture’, ‘learning culture’, and ‘hacker culture’. Data reduction continued through the

coding and organising of the data and themes. This process allowed the researcher to sort, focus, discard and organise data in a way that final conclusions could be drawn and verified (Miles & Huberman, 1994). The main themes were checked against one another, each sub-theme, and against the impressions and thoughts initially documented during the familiarisation phase to ensure that they were consistent, coherent, and distinctive.

4.8 Integration of Methods

For a mixed methods study design to be successful, careful attention to the integration of methods is required throughout the study. The complementary use of a survey and interviews enabled this research project to pose related but different research questions in relation to organisational culture and innovation in subsidiaries. The first instance of integration of the methods took place when the survey results were used to identify a purposeful and embedded sample for interviews. This approach allowed the researcher to gather explanations for the survey results through an in-depth inquiry with a sub-sample of participants. The innovation data of survey participants was used to define the interview sample. The preliminary analysis of the survey findings framed the development of the interview guide.

The main instance of integration occurred following the analysis of the first, quantitative phase and the second, qualitative phase, in order to discuss to what extent the qualitative data helped explain the quantitative results. The interview findings were used to interpret, contextualise, and expand the understanding of the survey results. This approach allowed some findings to be corroborated whereas others provided related but separate explanations. For example, whereas some of the results from the quantitative phase were unexpected and could only be assumed to be related to the study's unique context, this assumed relationship could be followed up on in the qualitative phase. The researcher created a document group for each participant within MAXQDA which allowed bringing together data from the quantitative and the qualitative phase of this study, enabling the researcher to access everything known about a particular participant including the interview recordings. Integration throughout the interpretation process allowed the researcher to find answers to questions that could not have been fully answered if the statistical results and the qualitative findings had been interpreted separately.

4.9 Challenges in Mixed Methods Research

While a mixed methods approach was considered appropriate for this study, there are a number of challenges to mixed methods research that need to be recognised. Firstly, a mixed methods approach comes with a need for extensive data collection which may be time-consuming and resource-intensive. Secondly, the analysis of both quantitative and qualitative data is more time-intensive than the analysis of just one type of data on its own. And thirdly, choosing a mixed methods approach requires the researcher to be familiar with both quantitative and qualitative research approaches. Teddlie and Tashakkori (2010, p. 16) even refer to the notion of the researcher as a “connoisseur of methods”. Cameron (2011) further expands on this by highlighting the need for mixed methods researchers to be “methodologically trilingual”:

Not only do they need strong grounding in their chosen quantitative and qualitative methodologies and associated paradigms but they also need to be cognisant, knowledgeable and fluent in the theoretical foundations of mixed methods, the specific mixed method methodological issues (research designs and typologies, mixed methods sampling, data priority, implementation and integration) and the quality frameworks that have been developed for mixed methods. (p. 264)

This deep knowledge of the differing research approaches is considered necessary because mixed method research designs can be very complex. However, an explanatory sequential design is rather straightforward in nature (Creswell & Plano Clark, 2011, p. 85). So, by choosing this type of design some of the complexities inherent in a convergent, embedded or transformative research design are foregone. An explanatory sequential design is also easier to implement as the different methods are used in separate steps. This separation into two distinct stages also makes it easy to describe and report on the study (Creswell, 2009). There are a number of challenges, however, that arise with regard to this specific mixed methods research design. Firstly, an explanatory sequential design requires a lengthy amount of time to implement the two phases. While the quantitative phase using the web-based survey was not too time-intensive, the time budgeted for the qualitative second phase – even if limited to just a small number of participants – needed to be longer. Secondly, it may also be difficult to plan and implement one method by drawing on the findings of another. By first conducting the quantitative phase and then examining the results to see which ones are unclear or unexpected, an informed strategic decision could be made about which results to follow up on.

4.10 Validity and Rigour

Validity has been identified as one of the six major issues in mixed methods research and as the most important aspect of a research project (Creswell & Plano Clark, 2011). Validity in mixed methods research is defined as “employing strategies that address potential issues in data collection, data analysis, and the interpretations that might compromise the merging or connecting of the qualitative and quantitative strands of the study and the conclusions drawn from the combination” (Creswell & Plano Clark, 2011, p. 239). During the separate quantitative and qualitative phases, a number of different measures were employed in order to ensure the validity of the resultant data. The next section will outline those measures and discuss the strategies taken in the phases of data collection and data analysis.

4.10.1 Validity in the Quantitative Phase

In the first, quantitative phase there were three different types of validity that were established. Firstly, content validity, which refers to whether the items measure the content they were indicated to measure. Secondly, predictive validity, which describes whether scores predict a criterion measure. Predictive validity is often established using factor analysis. And lastly, construct validity, which is concerned with whether items do indeed measure the relevant hypothetical constructs or concepts.

The survey instrument that was used during the first, quantitative phase was built on existing instruments that had previously been tested for reliability and validity and therefore ensured sound psychometric properties. The composite survey instrument used in this study was constructed from items from seven different existing instruments. Several items were taken from the Denison Organisational Culture Survey (DOCS) (Denison & Neale, 1996). The DOCS is one of the most well-researched effectiveness instruments to date (Denison et al., 2014) and its predictive validity has been established in a study by Denison and Mishra (1995). The DOCS' applicability in an international context has also been demonstrated (Fey & Denison, 2003). Items have also been adopted from the KEYS to Creativity and Innovation instrument (Amabile et al., 1996), which is one of the first and most well-known assessments of creativity. Convergent, discriminant, and construct validity have been shown to be satisfactory and thus the instrument has been shown to be psychometrically sound (Amabile et al., 1996). The Organisational Culture Profile (OCP) developed by O'Reilly et al. (1991) is another instrument that was drawn on for the purposes of this study. The OCP has been used in a wide variety of contexts and its validity and reliability have been established (Jung et al., 2009; O'Reilly et al., 1991). Several

items from a subsequent version of the OCP were also adopted. This subsequent version has also been tested for validity and reliability (Sarros et al., 2003). Items from FOCUS, an instrument developed by van Muijen et al. (1999), were also used in the construction of the questionnaire. The instrument has been checked for internal consistency (van Muijen et al., 1999). Another instrument that was used for the purpose of this study is Dobni's (2008) innovation culture construct. This model employed an explanatory factor analysis and content and construct validity were established (Dobni, 2008). The Group Practice Culture Questionnaire by Krlewski et al. (2005) was also drawn on for this study. Internal consistency has been shown for that questionnaire, while only some types of validity (predictive validity, discriminative validity, and dimensional validity) have been demonstrated (Krlewski et al., 2005). Lastly, some items were adopted from the van der Post questionnaire (van der Post et al., 1997). Internal consistency has been established for this instrument. No data has been reported on some types of validity, but dimensional validity has been demonstrated (Jung et al., 2009; van der Post et al., 1997). In order to establish the construct validity of the survey instrument, the researcher conducted a principal axis factor analysis with varimax rotation to assess the underlying structure of the five subscales of the survey instrument. The results of the factor analysis indicated that the five subscales of organisational culture were internally consistent (see section 5.3.1).

Another important concern in this phase was the reliability of the data. This refers to the internal consistency of the instrument used; that is whether the items' responses are consistent across constructs. When one modifies an instrument or combines instruments in a study, the original validity and reliability may not hold for the new instrument and it becomes necessary to establish validity and reliability during data analysis (Creswell, 2009). As the researcher combined a number of different instruments in order to design the Innovation and Organisational Culture Survey, Cronbach's alpha was calculated to conduct a reliability check of the internal consistency of the survey scales. The scales in the survey were considered reliable as they met or exceeded alpha levels of 0.7, which was considered "good" according to the criteria set by Nunnally (1978). Table 5.2 presents the reliability of the five components of the organisational culture construct.

4.10.2 Rigour in the Qualitative Phase

The criteria for establishing quality in qualitative research evolved from those used in quantitative research (Lincoln & Guba, 1985). It is generally accepted that in the real social world one cannot control factors that influence a specific situation as it is personally

interpretive (Schwandt, 1990 in Miles & Huberman, 1994). While it may be impossible to ensure objectivity in qualitative research, that should not be taken to mean that shared standards should not be established (Miles & Huberman, 1994). There are different criteria used to assess the rigour of qualitative research but the most common are those proposed by Lincoln and Guba (1985): credibility, transferability, dependability, and confirmability.

4.10.2.1 Credibility

Credibility refers to the value and believability of the findings (Lincoln & Guba, 1985) and involves two processes: conducting the research in a believable manner and being able to demonstrate credibility. This criterion is parallel to internal validity in the positivist domain. Lincoln and Guba (1985) argue that credibility is one of the most important factors in establishing trustworthiness. Prolonged engagement until the researcher has gained full understanding of the phenomena investigated is one strategy of ensuring credibility. The interviews with top management in subsidiaries were continued until it was felt that their experiences had been fully explored. Peer debriefing is another approach to ensure that interpretation of the data is credible. This was pursued formally and informally during the conduct of this research. Presentations at PhD seminars and conferences as well as conversations with the supervisor and other academic staff at the School of Business of emerging findings aided the researcher with engaging and exploring additional perspectives on the data.

4.10.2.2 Transferability

Transferability in qualitative research is similar to generalisability in quantitative research. It is reliant on the thick description of the context and the reality of participants (Lincoln & Guba, 1985). In the final report, the researcher offered rich and detailed descriptions, so that readers could make informed decisions about the applicability of the findings to specific contexts. The context was described and raw data, in the form of appropriate direct quotes from participants, were provided to further enhance transferability.

4.10.2.3 Dependability and Confirmability

Dependability refers to the stability of data and is similar to the concept of reliability in quantitative research (Lincoln & Guba, 1985). Confirmability describes the neutrality and objectivity of the data and is concerned with ensuring that the findings are the results of the experiences and thoughts of the participants, rather than the preferences of the researcher (Lincoln & Guba, 1985). One technique to ensure both dependability and confirmability is an audit trail. An audit trail provides an outline of the decisions made by a researcher from

the beginning of a research project to the development and reporting of findings. The purpose of an audit trail is to determine if the findings and inferences are both logical and grounded in the data (Lincoln & Guba, 1985) and, therefore, represent faithful descriptions recognisable to the reader (Rubin & Rubin, 2012). An audit trail was considered advisable in this study given the researcher's novice experience in qualitative research. Using qualitative software, such as MAXQDA, can enhance the rigour of the research by providing a comprehensive 'trail' of decisions made during data collection and analysis (Silverman, 2010). Moreover, the 'coding query tool' in MAXQDA allows for the audit of findings and helps guard against excessive emphasis on rare findings that happen to suit the researcher's preferred argument (Silverman, 2010). By using this tool, the researcher ensured that any issue described in the findings was not the perception of just one participant, but rather contributed to and confirmed that a number of participants held the same opinion. The study data has been retained and the coding and analysis process is demonstrated in the MAXQDA printouts generated throughout the process (Appendix F). The inclusion of a transcript in the appendix (Appendix G) provides additional transparency and demonstrates credibility.

4.11 Summary

This chapter illustrates the decisions made throughout this research project as the researcher integrated two very different research approaches to fulfil the research aims. The concept of innovation-supportive organisational culture in subsidiaries could not have been fully interpreted from the data collected through the quantitative survey. The semi-structured interviews, therefore, proved to be a suitable means to capture a more comprehensive understanding of the perceptions of an innovation-supportive culture as well as contextual factors that affect the relationship between organisational culture and innovation in subsidiaries.

5 PHASE ONE: SUBSIDIARY SURVEY AND FINDINGS

5.1 Introduction

The overall mixed methods design of this study and the rationale for its choice has been discussed in the previous chapter. This chapter provides a detailed overview of the research findings of the first quantitative phase as well as the analysis and discussion of those findings. This phase of the research was guided by the first research question. Three sets of hypotheses and sub-hypotheses were tested to examine the relationship between different dimensions of organisational culture and innovation in subsidiaries of multinational ICT organisations in Ireland. The structure of this chapter is as follows: Firstly, the descriptive statistics are presented in order to show the association between variables. Secondly, the results of the inferential statistics are presented. Finally, the results of the hierarchical multiple regression analyses are presented, along with a synopsis of the main findings and a preliminary discussion placing these in the context of other published literature. A further discussion of the survey findings integrated with the findings from Phase Two (interviews) of the study will be presented in Chapter 7. The limitations of this phase of the study are also discussed.

The data in this chapter focuses specifically on the relationships and differences between different forms of innovation, and participants' perceptions of their organisational culture with regard to five specific dimensions (autonomy and teamwork, support for change, risk-taking, trust and openness, and constructive conflict). The results of the survey support the

assertion that organisational culture does impact on innovation in subsidiaries, and that the degree of impact differs between forms of innovation as well as idea generation and innovation implementation.

In the previous chapter, one research question and three hypotheses (Table 5.1) that guide the first phase of this study were outlined. The research question being addressed is “What dimensions of organisational culture predict the number of innovations implemented in multinational subsidiaries in the Irish ICT sector?”

Table 5.1: Research Hypotheses

Hypotheses
<p>Hypothesis 1</p> <p>H1₀: The more the organisational culture emphasises specific dimensions of an innovative culture, the higher the presence of innovation.</p>
<p>Hypothesis 2</p> <p>H2₀: The relationship of innovation to organisational culture differs for specific forms of innovation.</p> <p>H2_a: Organisational culture has an influence on product innovation.</p> <p>H2_b: Organisational culture has an influence on process innovation.</p> <p>H2_c: Organisational culture has an influence on marketing innovation.</p> <p>H2_d: Organisational culture has an influence on organisational innovation.</p>
<p>Hypothesis 3</p> <p>H3₀: Organisational culture has an influence on innovation generation.</p>

5.2 Data Management and Analysis

This section describes the approaches adopted for the management and analysis of the survey questionnaire data.

The survey data from the completed questionnaires was coded by the author and entered into SPSS version 22. The data was screened for errors using descriptive statistics to check for values falling outside the expected range for each variable. Following screening of the data, and before any analysis was undertaken, reliability estimates were performed for each scale and subscale. The Cronbach’s alpha values computed for the five dimensions of organisational culture are considered in the Findings section of this chapter.

The survey questionnaire consisted of two sections, one on organisational culture and the other on innovation. The first section of the questionnaire, the organisational culture section, was responded to by a minimum of three respondents per organisation, in order to provide a representative cross-section of the respective subsidiary. These respondents were asked to indicate their agreement with value statements on a five-point Likert scale. The second section of the questionnaire, the innovation section, was responded to by at least a single respondent in each subsidiary, where that respondent had self-identified as having knowledge of innovation activities. These respondents provided data on the number of different forms of innovation implemented, the number of ideas generated and the subsidiary's approach towards collaboration in the innovation process. Where two respondents to the innovation section existed in a subsidiary, the mean of the two responses was calculated.

As described in Chapter 4, survey invitations were emailed to 62 contacts in 62 different organisations. After five reminders, a total of 44 questionnaires were returned. Seven questionnaires were incomplete and were therefore excluded, which left a remainder of 37 completed questionnaires. These 37 questionnaires represent individual responses. As described above, the study requires a minimum of three individual responses per organisation in order to arrive at a representative measure of organisational culture in each of the participating subsidiaries. The 37 individual responses reflect responses of nine different organisations. Therefore, the response rate was 14.52% (9/62).

Before beginning the in-depth analysis of the survey data, preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. As part of this procedure, outlying cases in the variables relating to the number of innovations were identified. Upon further inspection, the outliers' scores were identified as genuine. It was decided to retain the outlying cases as the variables were critical to the analysis. In order to reduce their impact, a strategy suggested by Tabachnick and Fidell (2010) was followed. The outlying cases were assigned a raw score on the variables in question that was one unit larger than the next most extreme score in the distribution, so that the influence of the outlier was reduced. Only complete data sets were included in the final data analysis. Consequently, the number of respondents reported in analyses differs.

Descriptive statistics including frequency distribution tables, means and standard deviations were computed to summarise the data. One-Way Analysis of Variance (ANOVA) tests were applied to test for differences in the number of innovations implemented based on subsector membership, the differences in mean organisational culture scores between respondent age, role, and tenure as well as the differences in mean organisational culture scores based on subsector membership. Multiple regression analyses were performed to identify organisational culture predictor variables for the number of innovations implemented and the number of ideas generated. Post hoc power analyses were conducted using the software package G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) and are reported alongside the respective regression models. The recommended effect sizes for this assessment are as follows: small ($f^2 = .02$), medium ($f^2 = .15$), and large ($f^2 = .35$) (Cohen, 1988).

Hierarchical multiple regression was performed in this study. In a hierarchical multiple regression control variables are entered into the regression equation first before the entry of independent variables. This allows testing the effects of certain variables while controlling for the amount of variance explained by variables already entered into the regression model (Tabachnick & Fidell, 2010). This analytic strategy was chosen for this study on the basis that hierarchical multiple regression allows the analysis of a variance on a dependent variable that can be explained by independent variables that are correlated with each other (Pedhazur, 1997). Correlation between the predictor variables is likely to be the case when analysing a number of different dimensions of organisational culture. Further, subsidiary age was a control variable in the multiple hierarchical regression models, as – based on the literature review – firm age had been identified as influencing innovation within an organisation. Subsidiary size was excluded from the analyses, following Tabachnick and Fidell's (2010) advice that variables with a bivariate correlation of more than .70 should not be included in multiple regression analysis.

5.3 Survey Findings

This section reports the results of the data analyses undertaken. This includes tests performed, the calculation of descriptive statistics, the inferential statistics, and the hierarchical regression analyses.

5.3.1 Reliability and Validity

In quantitative research, the reliability and validity of the survey instrument are very important for decreasing errors that might arise from measurement problems in the study.

The reliability, or internal consistency, of the organisational culture construct was assessed using Cronbach's alpha. Alpha levels ≥ 0.7 were considered "good" according to the criteria set by Nunnally (1978). The reliability of the five components of the organisational culture construct is presented in Table 5.2, indicating that the scale is reliable in this survey sample.

Table 5.2: Reliability of Organisational Culture Construct in the Sample

Components	Cronbach's α	No. of Items	Valid Responses
Autonomy and Teamwork	.797	8	37
Support for Change	.730	8	37
Risk-Taking	.845	6	37
Trust and Openness	.834	5	37
Constructive Conflict	.809	6	37

In order to establish the construct validity of the survey instrument, factor analysis was used. The researcher conducted a principal axis factor analysis with varimax rotation using SPSS Version 22 to assess the underlying structure of the five subscales of the survey instrument. The criterion for the significance of factor loadings was set at .4 cut-off level, which is considered neither too liberal nor too conservative (Tabachnick & Fidell, 2010).

Initially, the eight items of the 'autonomy and teamwork' subscale were examined. Firstly, inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. Secondly, the Kaiser-Meyer-Olkin measure of sampling adequacy was .71, above the commonly recommended value of .6, and Bartlett's Test of Sphericity reached statistical significance, supporting the factorability of the correlation matrix. Principal axis factor analysis revealed the presence of two factors with eigenvalues exceeding 1. The rotated solution showed two factors (autonomy and teamwork) with all items' factor loadings significant at .4 cut-off level. The item 'There is a great deal of tolerance of individual working styles' had a primary factor loading of .54 on autonomy and a cross-loading of .43 on teamwork. Since the autonomy and teamwork scale is a composite scale combining two structural facilitators of innovation and the difference between the factor

loadings was more than .10 (cf. Snell & Dean, 1992), it was decided to retain the item. The factor loadings for the autonomy and teamwork scale are shown in Appendix H.

Secondly, the factorability of the eight 'support for change' items was examined. The inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. Additionally, the Kaiser-Meyer-Olkin measure of sampling adequacy was .63, exceeding the recommended value of .6, and Bartlett's Test of Sphericity reached statistical significance, suggesting reasonable factorability. Two factors were requested, based on the fact that the items were designed to index two constructs: support for change and belief in action. The rotated solution revealed the presence of simple structure, with both factors showing strong loadings and all items loading substantially on only one factor. One item on the first factor ("Attempts to create change usually meet with resistance.") had a factor loading of .38. As this was only marginally below the .4 cut-off level and the item had no cross-loading of .3 or above, it was decided to retain the item. After rotation, the first factor accounted for 29.4% of the variance and the second factor accounted for 24.1%. So, construct validity was evident for this subscale. The factor loadings for the support for change subscale are presented in Appendix I.

For the subscale 'risk-taking', inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Olkin measure of sampling adequacy was .79, above the commonly recommended value of .6, and Bartlett's Test of Sphericity reached statistical significance, supporting the factorability of the correlation matrix. The factor analysis produced a simple structure. All the items loaded on one factor, with factor loadings above .59. The construct validity was evident for this scale. The factor loadings for the risk-taking subscale are shown in Appendix J.

For the subscale 'trust and openness', many items correlated at least .3 with at least one other item. The Kaiser-Meyer-Olkin value was .71, exceeding the recommended value of .6, and Bartlett's Test of Sphericity reached statistical significance, suggesting reasonable factorability. The factor analysis produced a simple structure, with all items loading on one factor, with factor loadings above .57. All of the items on this subscale measured the same construct. The factor loadings for the trust and openness subscale are presented in Appendix K.

Finally, it was observed that many items on the 'constructive conflict' subscale had coefficients of .3 and above in the correlation matrix. The Kaiser-Meyer-Olkin value was .79, above the recommended value of .6, and the Bartlett's Test of Sphericity reached

statistical significance, supporting the factorability of the correlation matrix. All the items loaded on one factor, with factor loadings above .46. The construct validity was evident for this scale. The factor loadings for the constructive conflict subscale are shown in Appendix L.

Overall, this analysis indicated that the five subscales of organisational culture were internally consistent.

5.3.2 Descriptive Statistics

This section provides a description and summary of the quantitative survey data.

5.3.2.1 Profile of the Respondents

The study participants were compared on the following demographic characteristics: age (Figure 5.1), role (Figure 5.2), subsector membership (Figure 5.3) as well as their length of tenure (Figure 5.4). The sample covered subsidiaries in all of the main ICT subsectors as well as all management levels within the subsidiaries. The majority of respondents (83.86%) had been with their respective organisation for more than two years and were therefore well positioned to respond to questions on their respective organisation's culture (Figure 5.4). Data was also collected on how long the organisation had been trading at all locations in Ireland (Figure 5.5) and the approximate number of employees in the organisation's Irish operations (Figure 5.6).

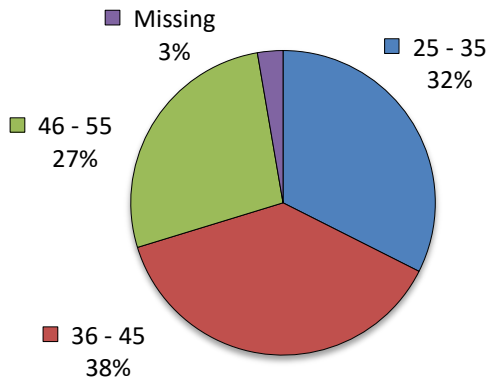


Figure 5.1: Respondent Age

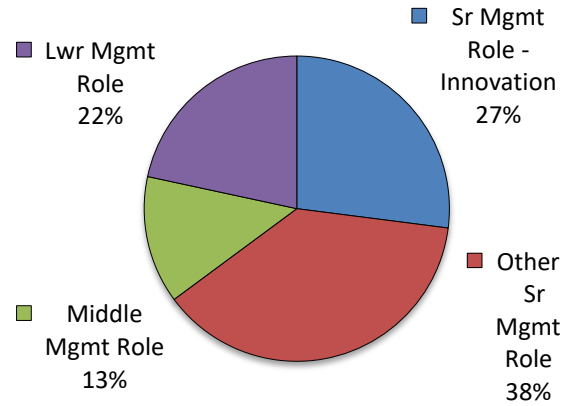


Figure 5.2: Respondent Role

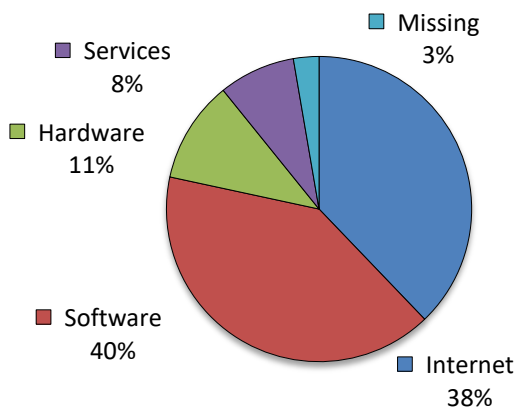


Figure 5.3: Industry Subsector

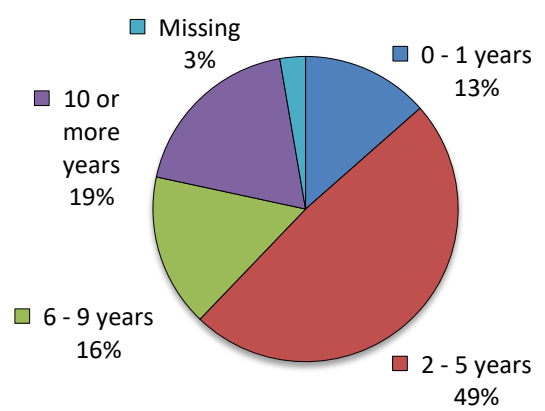


Figure 5.4: Respondent Tenure

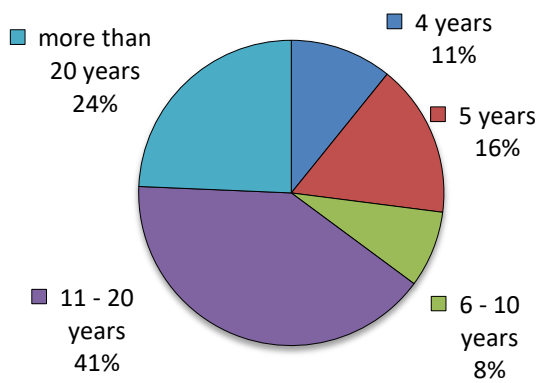


Figure 5.5: Subsidiary Age

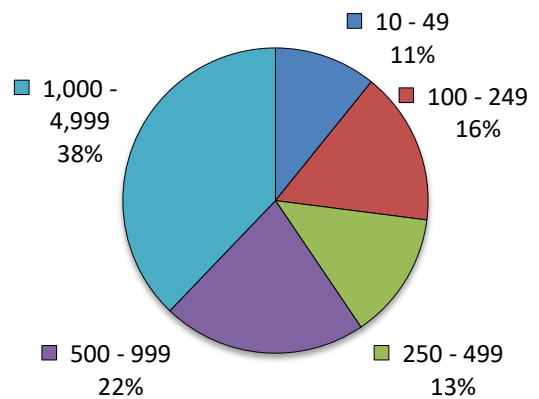


Figure 5.6: Subsidiary Size

5.3.3 Descriptive Analysis of Questionnaire Data

This section presents a summary of the 37 respondents' perception of organisational culture as assessed in the organisational culture section of the questionnaire and a description of the data from the innovation section of the questionnaire.

5.3.3.1 Organisational Culture

The breakdown of respondents' replies on their agreement with each statement on organisational culture is presented in Table 5.3. Respondents were asked to score their agreement with individual statements on five organisational culture dimensions on a five-point Likert scale ranging from 1 = strongly disagree to 5 = strongly agree.

On average, the scores for autonomy and teamwork, support for change, risk-taking, trust and openness, and constructive conflict were 4.11, 3.83, 3.69, 3.87, and 3.82, respectively. A higher score for each item indicated stronger agreement of the respondents on it. In all, higher scores on the dimensions of organisational culture indicated a culture that more strongly embraced autonomy and teamwork, support for change, risk-taking, trust and openness, or constructive conflict, while a lower score indicated a lower value being placed on these cultural dimensions.

Table 5.3: Scoring on Organisational Culture Statements

Organisational Culture Statements	N	Mean Score 5-Point	SD
Autonomy and Teamwork			
In our organisation...			
Teamwork is used to get work done, rather than hierarchy.	37	4.32	0.58
Our decision-making process can best be described as consensus building.	37	3.89	0.774
Teams are our primary building blocks.	37	4.16	0.764
There is a great deal of tolerance of individual working styles.	37	4.05	0.815
We have the freedom to decide how we are going to carry out our projects.	37	4.16	0.688
We actively encourage cooperation across different parts of the organisation.	37	4.3	0.702
Business planning is ongoing and involves everyone in the process to some degree.	37	3.73	0.769
People work like they are part of a team.	37	4.24	0.683
Support for Change			
In our organisation...			
New ideas are encouraged.	37	4.62	0.545
We are willing to experiment.	37	4.35	0.674
The way things are done is very flexible and easy to change	37	3.78	1.158
New and improved ways to do work are continually adopted.	37	4.03	1.04
Attempts to create change usually meet with resistance.	37	3.38	1.01
Everyone believes that he or she can have a positive impact.	37	3.86	1.004
We are quick to take advantage of opportunities.	37	3.38	1.163
We often search for new opportunities in the external environment.	37	3.22	1.158
Risk-Taking			
In our organisation...			
Innovation and risk-taking are encouraged and rewarded.	37	3.73	0.902
Uncertainty is viewed as opportunity, not as risk.	37	3.54	1.043
Failure is acceptable, if the effort on the project was good.	37	3.46	1.043
We have a good mechanism for encouraging and developing creative ideas.	37	3.51	0.837
We view failure as an opportunity for learning and improvement.	37	3.62	0.982
Innovation is a core value.	37	4.3	0.812
Trust and Openness			
In our organisation...			
There is a high degree of organisational trust.	37	3.81	0.811

We freely share information around the organisation.	37	4.14	0.887
Differing views are encouraged.	37	3.84	0.727
Information is widely shared so that everyone can get the information he or she needs when it's needed.	37	3.84	0.958
Our compensation formula is well aligned with our organisation's goals.	37	3.73	1.018
Constructive Conflict			
In our organisation...			
It is easy to reach consensus, even on difficult issues.	37	3.38	0.861
When disagreements occur, we work hard to achieve win-win situations.	37	3.86	0.887
We are encouraged to challenge decisions and actions if we think there is a better way.	37	4.14	0.631
We challenge each other's ideas in a constructive way.	37	3.97	0.799
Everyone takes responsibility for his/her own actions.	37	3.92	0.722
We directly confront problems.	37	3.65	1.086
Total	37		

5.3.3.2 Innovation

As indicated previously, the innovation section of the questionnaire was addressed to respondents in a senior management role with knowledge of innovation activities in their respective subsidiary. Table 5.4 provides the percentage of responding subsidiaries that were engaged in the different forms of innovation over the three years 2011 to 2013. On average, product, process, and organisational innovations were more likely to be engaged in than marketing innovations were.

Table 5.4: Responses to Innovation Section of Questionnaire

Innovation Questions	Percentage		
	Yes	No	Total
Product Innovation			
During the three years 2011 to 2013, did your organisation introduce new or significantly improved goods?	81.08	18.92	100.00
During the three years 2011 to 2013, did your organisation introduce new or significantly improved services?	78.38	21.62	100.00
Process Innovation			
During the three years 2011 to 2013, did your organisation introduce new or significantly improved methods of producing goods or services?	75.68	24.32	100.00
During the three years 2011 to 2013, did your organisation introduce new or significantly improved logistics, delivery and distribution methods for your inputs, goods or services?	84.85	15.15	100.00
During the three years 2011 to 2013, did your organisation introduce new or significantly improved techniques, equipment and software in support activities, such as purchasing, accounting, computing and maintenance?	78.79	21.21	100.00
Marketing Innovation			
During the three years 2011 to 2013, did your organisation introduce significant changes to product design and packaging?	67.57	32.43	100.00
During the three years 2011 to 2013, did your organisation introduce new methods for goods or service placement or sales channels?	45.95	54.05	100.00
During the three years 2011 to 2013, did your organisation introduce new media or techniques for goods or service promotion?	32.43	67.57	100.00
During the three years 2011 to 2013, did your organisation introduce new methods of pricing goods or services?	37.84	62.16	100.00
Organisational Innovation			
During the three years 2011 to 2013, did your organisation introduce new business practices for organising procedures?	87.88	12.12	100.00
During the three years 2011 to 2013, did your organisation introduce new methods of organising work responsibilities and decision making?	89.19	10.81	100.00
During the three years 2011 to 2013, did your organisation introduce new methods of organising external relations with other firms or public institutions?	87.88	12.12	100.00

Table 5.5 presents the number of the different forms of innovations implemented by the responding subsidiaries in 2013. Since some of the organisations had two respondents to the innovation section, the table shows the mean. Generally, the number of process innovations implemented was slightly higher than that of organisational innovations.

As per the OECD definition, a product innovation is “a good or service that is new or significantly improved. This includes significant improvements in technical specifications,

components and materials, software in the product, user friendliness or other functional characteristics” (OECD/Eurostat, 2005, p. 48). This division by the OECD of product innovation into either a good or service was reflected in the questionnaire. It allows for the analysis of the results for the aggregate construct of product innovation and aids in establishing whether any differences exist between goods and service innovations.

Table 5.5: Number of Innovations Implemented in Subsidiaries

Sub.	In 2013, approximately how many new or significantly improved goods did your organisation introduce into the market? (Mean) ¹	In 2013, approximately how many new or significantly improved services did your organisation introduce into the market? (Mean)	In 2013, approximately how many new or significantly improved processes did your organisation introduce? (Mean)	In 2013, approximately how many organisational innovations did your organisation introduce? (Mean)	For 2013, please estimate the percentage of marketing expenses that were assigned to marketing innovations. (Mean)
A	1.00	0.00	5.00	5.00	10.00
B	4.00	2.00	3.00	10.00	0
C	6.00	3.00	5.00	8.00	20.00
D	2.00	10.00	10.00	5.00	10.00
E	1.50	4.50	5.00	4.00	5.00
F	0	0	2.00	m ²	10.00
G	0	2.00	1.50	1.50	5.00
H	10.00	11.00	19.00	10.00	20.00
I	1.00	7.00	17.50	12.50	17.50
Mean	3.43	4.70	8.00	7.39	11.55

¹ Some organisations had two respondents to the innovation section. The mean of their responses is therefore shown here.

² m denotes a missing value

Similarly, Table 5.6 details the respondents’ replies to the question of how many ideas for the different forms of innovations were generated in 2013. On average, most ideas were generated for process innovations and the least amount of ideas were generated for marketing innovations.

Table 5.6: Number of Ideas Generated in Subsidiaries

Sub.	In 2013, approximately how many ideas for new or significantly improved goods did your organisation generate? (Mean) ¹	In 2013, approximately how many ideas for new or significantly improved services did your organisation generate? (Mean)	In 2013, approximately how many ideas for new or significantly improved processes did your organisation generate? (Mean)	In 2013, approximately how many ideas for the above-mentioned organisational innovations did your organisation generate? (Mean)	In 2013, approximately how many ideas for new marketing methods did your organisation generate? (Mean)
A	100.00	0	100.00	50.00	10.00
B	m ²	m	5.00	10.00	0
C	10.00	7.00	25.00	20.00	20.00
D	2.00	20.00	20.00	10.00	3.00
E	3.00	9.50	15.00	5.00	15.00
F	m	m	5.00	m	8.00
G	0	4.00	3.00	3.00	2.50
H	5.00	50.00	100.00	20.00	20.00
I	1.50	15.00	30.00	12.50	20.00
Mean	17.40	17.59	37.95	17.61	11.66

¹ Some organisations had two respondents to the innovation section. The mean of their responses is therefore shown here.

² m denotes a missing value

Table 5.7 presents the degree to which responding subsidiaries engaged in collaboration with regard to their innovations. The majority of innovations were developed by the subsidiaries in the sample without any collaboration. Only for process innovations was there close to an equal split between subsidiaries that developed innovations on their own and those that collaborated with other organisations and institutions.

Table 5.7: Responses to Collaboration on Innovation

Collaboration on Innovations	Mainly your organisation (%)	Mainly your organisation together with other organisations or institutions (%)	Mainly other organisations or institutions (%)
Who developed these product innovations?	72.97	21.62	5.41
Who developed these process innovations?	45.95	43.24	10.81
Who developed these marketing innovations?	74.19	12.90	12.90
Who developed these organisational innovations?	75.00	25.00	0.00

5.3.4 Inferential Statistics

The section below presents the result of the inferential analysis of the data. ANOVA analyses were performed to compare mean scores between different groups of subsidiaries.

5.3.4.1 Number of Innovations Implemented Based on Subsector Membership

A one-way between-groups analysis of variance was conducted to compare the effect of subsidiary subsector membership on the total number of innovations implemented. Subsidiaries were divided into three groups (Group 1: internet subsector; Group 2: hardware and software subsector; Group 3: services subsector). Since the assumption of homogeneity of variance was not met for this data, the obtained Welch's adjusted F ratio (9.31) was used. There was a statistically significant difference at the $p < .05$ level in the total number of innovations implemented for the three groups [$F(2,34) = 9.31, p = .001$]. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for the internet subsector ($M=35.43, SD=15.57$) was significantly greater than that of the hardware and software subsector ($M=14.63, SD=9.79$) and the services subsector ($M=15, SD=6.93$). The mean scores in the hardware and software subsector were not significantly different from those in the services subsector. This result suggests that subsector membership has an effect on the total number of innovations implemented.

5.3.4.2 Organisational Culture Scoring Based on Respondent Position, Age, and Tenure

A one-way between-groups analysis of variance was conducted to explore the effect of the respondent's position within a subsidiary on the overall scoring of organisational culture. Subjects were divided into four groups according to their position (Group 1: senior management with knowledge of innovation activities; Group 2: senior management; Group

3: middle management; Group 4: lower management). There was no statistically significant difference at the $p < .05$ level in scores on the different dimensions of organisational culture for the four groups. This result suggests that the respondent position does not have an effect on the scoring of the organisational culture dimensions.

Likewise, a one-way between-groups analysis of variance was conducted to explore the impact of the respondent's age on the overall scoring of organisational culture. Subjects were divided into three groups according to their age (Group 1: 25 to 35; Group 2: 36 to 45; Group 3: 46 to 55). Since the assumption of homogeneity of variance was not met for this data, the obtained Welch's adjusted F ratio (.597) was used. There was no statistically significant difference at the $p < .05$ level in scores on the different dimensions of organisational culture for the three groups. This result suggests that the respondent's age does not have an effect on the overall scoring of the organisational culture dimensions.

A third one-way between-groups analysis of variance was conducted to explore the effect of the respondent's tenure in a subsidiary on the overall scoring of organisational culture. Subjects were divided into four groups according to their tenure (Group 1: 0 to 1 year; Group 2: 2 to 5 years; Group 3: 6 – 9 years; Group 4: 10 or more years). There was no statistically significant difference at the $p < .05$ level in scores on the different dimensions of organisational culture for the four groups. This result suggests that the respondent's tenure did not have an effect on the overall scoring of organisational culture.

5.3.4.3 Organisational Culture Scoring Based on Subsector Membership

A one-way between-groups analysis of variance was conducted to explore the impact of subsidiary subsector membership on the overall scoring of organisational culture. Subjects were divided into four groups according to their subsector (Group 1: ICT – Internet; Group 2: ICT – Software; Group 3: ICT – Hardware; Group 4: ICT – Services). There was no statistically significant difference at the $p < .05$ level in scores of organisational culture for the four groups. This suggests that subsector membership does not have an effect on the scoring of organisational culture.

5.3.5 Hierarchical Regression Analyses

As previously outlined separate hierarchical multiple regression analyses were conducted to test the three hypotheses. Because a regression equation is rather sensitive to the combination of variables that are included in it and will work best when each independent variable is highly correlated with the dependent variable but uncorrelated with the other

independent variables (Tabachnick & Fidell, 2010), the independent variables were assessed for multicollinearity before each of the analyses were performed. The hierarchical multiple regressions that were performed to test the research hypotheses (Table 5.1) and the results obtained from them are described in the following sections.

5.3.5.1 Hypothesis 1

The first hierarchical multiple regression model tests the effect of organisational culture on the total number of innovations implemented. The dimensions of organisational culture were regressed on the total number of innovations, after controlling for subsidiary age.

Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. An initial analysis of the correlations among the predictor variables was undertaken. The organisational culture dimension of constructive conflict was only lowly correlated ($r = .01$) with the total number of innovations and was therefore excluded from the regression analysis. The correlations amongst the predictor variables (subsidiary age, autonomy and teamwork, support for change, risk-taking, and trust and openness) included in the study were examined and these are presented in Table 5.8. All of these predictor variables were correlated with the total number of innovations implemented. This indicates that the data was suitably correlated with the dependent variable for examination through hierarchical multiple regression to be reliably undertaken. The collinearity diagnostics undertaken as part of the multiple regression procedure indicate no multicollinearity (Tolerance $> .01$, VIF < 10). With the use of a $p < .001$ criterion for Mahalanobis distance, no outliers among the cases were identified.

First, the control variable subsidiary age was entered in a block in the first step of hierarchical multiple regression. This model was not statistically significant $F(1, 35) = .37$; $p = .55$ and explained 1% of the variance in number of innovations (Table 5.9). In step two, the organisational culture variables were entered to examine the corresponding level of statistical significance and the amount of unique variance in the total number of innovations (ΔR^2) accounted for by the multidimensional organisational culture construct. The total variance explained by the model as a whole was 34% ($F(5, 31) = 3.15$; $p < .05$). The introduction of the organisational culture variables explained an additional 33% variance in the total number of innovations, after controlling for subsidiary age (R^2 Change = .327; $F(4, 31) = 3.82$; $p < .05$). In the final model support for change, risk-taking, and trust and openness were statistically significant, with $\beta_{CHA} = -.56$, $p < .05$, $\beta_{RI} = .51$, $p < .05$, and $\beta_{TR} = .47$, $p < .05$, respectively. This means that the more the organisational

culture emphasises a support for change, the lower the total number of innovations implemented in the subsidiary. The results further show that the more the organisational culture emphasises risk-taking and trust and openness, the higher the total number of innovations implemented in the subsidiary.

A post hoc power analysis was conducted using the software package G*Power (Faul et al., 2007). The sample size of 37 was used for the statistical power analysis and a total number of five predictors were used for the calculation. The alpha level used for this analysis was $p < .05$. The post hoc analysis revealed the statistical power for this regression model was 0.91, using an effect size of 0.49, which was calculated as $f^2 = VS/VE$, where VS is the proportion of variance explained by a set of predictors, and VE is the residual or error variance. Thus, there was more than adequate power (i.e. power $\geq .80$) at the large effect size level.

Table 5.8: Correlations for Continuous Variables

Variables	Total Number of Innovations	Subsidiary Age	Autonomy and Teamwork	Support for Change	Risk-Taking	Trust and Openness
Total Number of Innovations	1					
Subsidiary Age	.10	1				
Autonomy and Teamwork	.11	-.23	1			
Support for Change	-.13	-.59***	.43**	1		
Risk-Taking	.25	-.45**	.53***	.66***	1	
Trust and Openness	.34*	-.17	.61***	.44**	.49**	1

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 5.9: Hierarchical Regression Model of Total Number of Innovations

	R	R ²	ΔR ²	B	SE	β	t
Step 1	.10	.01					
Subsidiary Age				.19	.32	.10	.61
Step 2	.58	.34*	.33				
Subsidiary Age				.06	.35	.03	.18
Autonomy and Teamwork				-6.65	6.59	-.20	-1
Support for Change				-14.93	5.93	-.56*	-2.52
Risk-Taking				11.21	4.72	.51*	2.38
Trust and Openness				10.59	4.43	.47*	2.39

Note. Statistical significance: *p < .05; **p < .01; ***p < .001

5.3.5.2 Hypothesis 2

In order to test hypothesis 2 and its sub-hypotheses, separate hierarchical multiple regressions were performed of the five organisational culture dimensions on the four different forms of innovations, after controlling for subsidiary age.

5.3.5.2.1 Product Innovation (H2_a)

The below describes the hierarchical multiple regression of the five dimensions of organisational culture on the number of product innovations implemented. Again, preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. Additionally, the correlations amongst the predictor variables (subsidiary age, autonomy and teamwork, support for change, risk-taking, trust and openness, and constructive conflict) included in the study were examined and these are presented in Table 5.10. All predictor variables were correlated with the number of product innovation, which indicates that the data was suitably correlated with the dependent variable for examination through hierarchical multiple regression to be reliably undertaken. With the use of a p < .001 criterion for Mahalanobis distance, no outliers among the cases were identified.

In the first step of hierarchical multiple regression, the control variable subsidiary age was entered. This model was not statistically significant $F(35, 1) = .268$; $p = .61$ and explained 1% of variance in the number of product innovations implemented (Table 5.11). In step

two, the five organisational culture variables were entered to examine the corresponding level of statistical significance and the amount of unique variance in the number of product innovations implemented (ΔR^2) accounted for by organisational culture. The total variance explained by the model as a whole was 32% ($F(6, 30) = 2.35; p = .056$). The introduction of the five organisational culture variables explained an additional 31% variance in the number of product innovations, after controlling for subsidiary age (R^2 Change = .312; $F(5, 30) = 2.75; p < .05$). In the final model support for change and trust and openness were statistically significant, with $\beta_{CHA} = -.57, p < .05$ and $\beta_{TRU} = .53, p < .05$, respectively. This means that the more the organisational culture emphasises a support for change, the lower the number of product innovations implemented in the subsidiary. The cultural dimension of trust and openness had a positive impact on the number of product innovations implemented. The more the organisational culture embraces trust and openness, the more product innovations are implemented.

A post hoc power analysis for this regression model was conducted using G*Power. The sample size of 37 was used for the statistical power analysis and a total number of six predictors were used for the calculation. The alpha level used for this analysis was $p < .05$. The post hoc analysis revealed the statistical power for this regression model was 0.83, using an effect size of 0.45. The effect size was calculated as $f^2 = VS/VE$, where VS is the proportion of variance explained by a set of predictors, and VE is the residual or error variance. This shows that there was more than adequate power (i.e. power * .80) at the large effect size level.

Table 5.10: Correlations for Continuous Variables

Variables	Number of Product Innovations	Subsidiary Age	Autonomy and Teamwork	Support for Change	Risk-Taking	Trust and Openness	Constructive Conflict
Number of Product Innovations	1						
Subsidiary Age	.09	1					
Autonomy and Teamwork	.17	-.23	1				
Support for Change	-.12	-.59***	.43**	1			
Risk-Taking	.25	-.45**	.53***	.66***	1		
Trust and Openness	.35*	-.17	.61***	.44**	.49**	1	
Constructive Conflict	.16	-.09	.64***	.34*	.52***	.41**	1

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 5.11: Hierarchical Regression Model of Number of Product Innovations

	R	R ²	ΔR^2	B	SE	β	t
Step 1	.09	.01					
Subsidiary Age				.07	.14	.09	.52
Step 2	.57	.32	.31				
Subsidiary Age				.01	.16	.01	.05
Autonomy and Teamwork				-1.42	3.37	-.10	-.42
Support for Change				-6.64	2.67	-.57*	-2.48
Risk-Taking				4.43	2.23	.46	1.99
Trust and Openness				4.34	2.00	.44*	2.17
Constructive Conflict				.05	2.37	.00	.02

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

As mentioned previously, with regard to product innovation the questionnaire distinguished between innovation in goods and innovation in services. The section below deals with the individual hierarchical multiple regressions for the division of product innovation into its components of goods innovation and service innovation.

5.3.5.2.2 *Goods Innovation*

This section describes the hierarchical multiple regression of the dimensions of organisational culture on the number of goods innovations implemented, after controlling for subsidiary age. The same steps as for the hierarchical multiple regression of product innovation were followed. So, to avoid repetition in describing the process followed, the results will be shown in tables below. Correlations amongst the predictor variables (subsidiary age, autonomy and teamwork, support for change, risk-taking, trust and openness, and constructive conflict) included in the study were examined and these are presented in Table 5.12. With the use of a $p < .001$ criterion for Mahalanobis distance, no outliers among the cases were identified.

As previously, in the first step of hierarchical multiple regression, the control variable subsidiary age was entered. This model was statistically significant $F(1, 35) = 7.39; p < .05$ and explained 17% of variance in the number of goods innovations (Table 5.13). In the second step, the five organisational culture variables were entered to assess their residual variance. The total variance explained by the final model as a whole was 53% ($F(6, 30) = 5.53; p < .01$). The introduction of the five organisational culture variables explained an additional 35% variance in the number of goods innovations, after controlling for subsidiary age ($R^2 \text{ Change} = .351; F(5, 30) = 4.43; p < .01$). In the final model subsidiary age, support for change, risk-taking, and trust and openness are statistically significant, with $\beta_{SA} = .34, p < .05$, $\beta_{CHA} = -.53, p < .01$, $\beta_{RI} = .40, p < .05$ and $\beta_{TRU} = .53, p < .01$, respectively. Subsidiary age had a positive impact on the number of goods innovations implemented. This means that as the firm ages, the number of goods innovations that are implemented rises. Support for change had a negative influence on the number of goods innovations implemented, meaning that subsidiaries with a strong support for change implement a lower number of goods innovations. The cultural dimensions of risk-taking and trust and openness had a positive influence on the number of goods innovations implemented. This means subsidiaries with an organisational culture that strongly embraces risk-taking and trust and openness implement a higher number of goods innovations.

Table 5.12: Correlations for Continuous Variables

Variables	Number of Goods Innovations	Subsidiary Age	Autonomy and Teamwork	Support for Change	Risk-Taking	Trust and Openness	Constructive Conflict
Number of Goods Innovations	1						
Subsidiary Age	.42**	1					
Autonomy and Teamwork	.11	-.23	1				
Support for Change	-.28*	-.59***	.43**	1			
Risk-Taking	.11	-.45**	.53***	.66***	1		
Trust and Openness	.36*	-.17	.61***	.44**	.49**	1	
Constructive Conflict	.18	-.09	.64***	.34*	.52***	.41**	1

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 5.13: Hierarchical Regression Model of Number of Goods Innovations

	R	R ²	ΔR^2	B	SE	β	t
Step 1	.42	.17*					
Subsidiary Age				.18	.07	.42*	2.72
Step 2	.73	.53**	.35				
Subsidiary Age				.14	.07	.34*	2.11
Autonomy and Teamwork				-1.25	1.45	-.17	-.86
Support for Change				-3.22	1.15	-.53**	-2.81
Risk-Taking				2.01	.96	.40*	2.10
Trust and Openness				2.71	.86	.53**	3.15
Constructive Conflict				.42	1.02	.07	.42

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

Following the same procedure as for previous regression models, a post hoc power analysis was conducted for the goods innovation regression model. A sample size of 37 was used

for the statistical power analysis and a total number of six predictors were used for the calculation. The alpha level used for this analysis was $p < .05$. The post hoc analysis revealed the statistical power for this regression model was 0.97, using an effect size of 0.74. The effect size was calculated as $f^2 = VS/VE$, where VS is the proportion of variance explained by a set of predictors, and VE is the residual or error variance. This shows that there was more than adequate power (i.e. power $\geq .80$) at the large effect size level.

5.3.5.2.3 *Service Innovation*

This section describes the hierarchical multiple regression of the five organisational culture dimensions on the number of service innovations implemented, after controlling for subsidiary age. The same steps as for the hierarchical regression of product innovation were followed. So, to avoid repetition in describing the process, the results will be shown in tables below. An initial analysis of the correlations of the predictor variables was undertaken. The organisational culture dimension of support for change was only lowly correlated ($r = .041$) with the number of service innovations and was therefore excluded from the regression analysis. Correlations amongst the predictor variables (subsidiary age, autonomy and teamwork, risk-taking, trust and openness, and constructive conflict) included in the study were examined and are presented in Table 5.14. With the use of a $p < .001$ criterion for Mahalanobis distance, no outliers among the cases were identified.

As previously, in the first step of hierarchical multiple regression, the control variable subsidiary age was entered. This model was not statistically significant $F(1, 35) = 1.60$; $p = .214$ and explained 4% of variance in the number of service innovations (Table 5.15). After entry of the four organisational culture variables at step two, the total variance explained by the model as a whole was 13% ($F(5, 31) = .90$; $p = .493$). The introduction of the four organisational culture variables explained an additional 8% variance in the number of service innovations, after controlling for subsidiary age ($R^2 \text{ Change} = .083$; $F(4, 31) = 1.42$; $p > .05$). In the final model, none of the predictor variables were statistically significant.

A post hoc power analysis was conducted for the service innovation regression model, using a sample size of 37 for the statistical power analysis and a total number of five predictors for the calculation. The alpha level used for this analysis was $p < .05$. The post hoc analysis revealed the statistical power for this regression model was 0.25, using an effect size of 0.10. This effect size was calculated as $f^2 = VS/VE$, where VS is the proportion of variance explained by a set of predictors, and VE is the residual or error

variance. This shows that there was less than adequate power (i.e. power * .80) at the small effect size level. By using an a priori test, the sample size needed to achieve a power of .80 for this small effect size was calculated. The required sample size was $N = 131$. The low power for this regression model could, therefore, be interpreted as an indication of a sample size that was too small to detect the effect obtained.

Table 5.14: Correlations for Continuous Variables

Variables	Number of Service Innovations	Subsidiary Age	Autonomy and Teamwork	Risk-Taking	Trust and Openness	Constructive Conflict
Number of Service Innovations	1					
Subsidiary Age	-.21	1				
Autonomy and Teamwork	.19	-.23	1			
Risk-Taking	.31*	-.45**	.53***	1		
Trust and Openness	.27	-.17	.61***	.49**	1	
Constructive Conflict	.12	-.09	.64***	.52***	.41**	1

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 5.15: Hierarchical Regression Model of Number of Service Innovations

	R	R ²	ΔR ²	B	SE	β	t
Step 1	.21	.04					
Subsidiary Age				-.11	.08	-.21	-1.26
Step 2	.36	.13	.08				
Subsidiary Age				-.04	.10	-.09	-.46
Autonomy and Teamwork				-.26	2.30	-.03	-.11
Risk-Taking				1.34	1.40	.23	.96
Trust and Openness				1.16	1.34	.19	.86
Constructive Conflict				-.47	1.61	-.07	-.29

Note. Statistical significance: *p < .05; **p < .01; ***p < .001

5.3.5.2.4 Process Innovation (H2_b)

The below describes the hierarchical multiple regression of the five organisational culture dimensions on the number of process innovations implemented, after controlling for subsidiary age. An initial analysis of the correlations of the predictor variables was undertaken. The organisational culture dimension of support for change was only lowly correlated ($r = .048$) with the number of process innovations and was therefore excluded from the regression analysis. The correlations amongst the predictor variables (subsidiary age, autonomy and teamwork, risk-taking, trust and openness, and constructive conflict) included in the study were examined and these are presented in Table 5.16. All of these predictor variables were correlated with the number of process innovations, which indicates that the data was suitably correlated with the dependent variable for examination through multiple linear regression to be reliably undertaken. With the use of a $p < .001$ criterion for Mahalanobis distance, no outliers among the cases were identified.

The control variable subsidiary age was entered as a block in the first step of the hierarchical multiple regression. This model was not statistically significant $F(1, 35) = .55$; $p = .464$ and explained 2% of variance in number of process innovations (Table 5.17). In step two, the four organisational culture variables were entered. The total variance explained by the model as a whole was 35% ($F(5, 31) = 3.28$; $p < .05$). The introduction of the four organisational culture variables explained an additional 33% variance in the

number of process innovations implemented, after controlling for subsidiary age (R^2 Change = .33; $F(4, 31) = 3.91$; $p < .05$). In the final model risk-taking and constructive conflict were statistically significant, with $\beta_{RI} = .51$, $p < .05$, and $\beta_{CON} = -.46$, $p < .05$, respectively. Risk-taking had a positive impact on the number of process innovations. This means that subsidiaries with organisational cultures that place an emphasis on risk-taking implement a higher number of process innovations. Constructive conflict, however, had a negative influence. This means that subsidiaries whose cultures scored higher on the constructive conflict dimension implemented a lower number of process innovations.

A post hoc power analysis was also conducted for the process innovation regression model, using a sample size of 37 for the statistical power analysis and a total number of six predictors for the calculation. The alpha level used for this analysis was $p < .05$. The post hoc analysis revealed the statistical power for this regression model was 0.98, using an effect size of 0.51. The effect size was calculated as $f^2 = VS/VE$, where VS is the proportion of variance explained by a set of predictors, and VE is the residual or error variance. This shows that there was more than adequate power (i.e. power $\times .80$) at the large effect size level.

Table 5.16: Correlations for Continuous Variables

Variables	Number of Process Innovations	Subsidiary Age	Autonomy and Teamwork	Risk-Taking	Trust and Openness	Constructive Conflict
Number of Process Innovations	1					
Subsidiary Age	-.12	1				
Autonomy and Teamwork	.11	-.23	1			
Risk-Taking	.37*	-.45**	.53***	1		
Trust and Openness	.37*	-.17	.61***	.49**	1	
Constructive Conflict	-.10	-.09	.64***	.52***	.41**	1

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 5.17: Hierarchical Regression Model of Number of Process Innovations

	R	R ²	ΔR ²	B	SE	β	t
Step 1	.12	.02					
Subsidiary Age				-.10	.14	-.12	-.74
Step 2	.59	.35*	.33				
Subsidiary Age				.09	.13	.11	.67
Autonomy and Teamwork				-.88	3.18	-.06	-.28
Risk-Taking				4.86	1.95	.51*	2.50
Trust and Openness				3.51	1.85	.36	1.90
Constructive Conflict				-5.12	2.23	-.46*	-2.29

Note. Statistical significance: *p < .05; **p < .01; ***p < .001

5.3.5.2.5 Marketing Innovation (H2_c)

Hypothesis 2_c was tested by regressing the organisational culture dimensions on the percentage of marketing expenses assigned to marketing innovations, after controlling for subsidiary age. Again, preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. An initial analysis of the correlations of the predictor variables was undertaken. The organisational culture dimensions of support for change and constructive conflict were only lowly correlated ($r = -.005$ and $r = .051$, respectively) with the percentage of marketing expenses assigned to marketing innovations and were therefore excluded from the regression analysis. Additionally, the correlations amongst the predictor variables (subsidiary age, autonomy and teamwork, risk-taking, and trust and openness) included in the study were examined and these are presented in Table 5.18. These predictor variables were correlated with the percentage of marketing expenses assigned to marketing innovations. This indicates that the data was suitably correlated with the dependent variable for examination through multiple linear regression to be reliably undertaken. With the use of a $p < .001$ criterion for Mahalanobis distance, no outliers among the cases were identified.

In step one of the hierarchical multiple regression, the control variable subsidiary age was entered. This model was not statistically significant $F(1, 35) = 3.33$; $p = .077$ and explained 9% of variance in the percentage of marketing expenses assigned to marketing

innovations (Table 5.19). In step two, the three organisational culture variables were entered. The total variance explained by the final model as a whole was 30% ($F(4, 32) = 3.47; p < .05$). The introduction of the three organisational culture variables explained an additional 22% variance in the percentage of marketing expenses assigned to marketing innovations, after controlling for subsidiary age ($R^2 \text{ Change} = .216; F(3, 32) = 3.30; p < .05$). In the final model subsidiary age was statistically significant, recording a beta value of $\beta_{SA} = .47, p < .01$. Subsidiary age had a positive influence on the percentage of marketing expenses assigned to marketing innovations, meaning that older subsidiaries assigned a larger percentage of marketing expenses to marketing innovations.

Again, a post hoc power analysis was conducted for this regression model, using a sample size of 37 for the statistical power analysis and a total number of four predictors for the calculation. The alpha level used for this analysis was $p < .05$. The post hoc analysis revealed the statistical power for this regression model was 0.76, using an effect size of 0.31. The effect size was calculated as $f^2 = VS/VE$, where VS is the proportion of variance explained by a set of predictors, and VE is the residual or error variance. This shows that there was less than adequate power (i.e. power * .80) at the moderate effect size level. By using an a priori test, the sample size needed to achieve a power of .80 for this moderate effect size was calculated. The required sample size was $N = 40$. The low power for this regression model could, therefore, be interpreted as an indication of a sample size that was too small to detect the effect obtained.

Table 5.18: Correlations for Continuous Variables

Variables	%age of Marketing Expenses assigned to Marketing Innovations	Subsidiary Age	Autonomy and Teamwork	Risk-Taking	Trust and Openness
%age of Marketing Expenses assigned to Marketing Innovations	1				
Subsidiary Age	.30*	1			
Autonomy and Teamwork	.16	-.23	1		
Risk-Taking	.21	-.45**	.53***	1	
Trust and Openness	.35*	-.17	.61***	.49**	1

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 5.19: Hierarchical Regression Model of Number of Marketing Innovations

	R	R ²	ΔR^2	B	SE	β	t
Step 1	.30	.09					
Subsidiary Age				.25	.14	.30	1.82
Step 2	.55	.30*	.22				
Subsidiary Age				.40	.14	.47**	2.82
Autonomy and Teamwork				-1.43	3.02	-.09	-.48
Risk-Taking				3.08	1.97	.31	1.56
Trust and Openness				3.44	2.00	.33	1.72

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

5.3.5.2.6 Organisational Innovation ($H2_d$)

This section describes the hierarchical multiple regression of the five organisational culture dimensions on the number of organisational innovations implemented, after controlling for subsidiary age. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. Additionally, the correlations

amongst the predictor variables (subsidiary age, autonomy and teamwork, support for change, risk-taking, trust and openness, and constructive conflict) included in the study were examined and these are presented in Table 5.20. All predictor variables were correlated with the number of organisational innovations. This indicates that the data was suitably correlated with the dependent variable for examination through multiple linear regression to be reliably undertaken. With the use of a $p < .001$ criterion for Mahalanobis distance, no outliers among the cases were identified.

In step one of the hierarchical multiple regression, the control variable subsidiary age was entered. This model was not statistically significant $F(1, 30) = 2.96; p = .10$ and explained 9% of variance in number of organisational innovations (Table 5.21). The five organisational culture variables were entered at step two. The total variance explained by the final model as a whole was 21% ($F(6, 25) = 1.11; p = .38$). The introduction of the five organisational culture variables explained an additional 12% variance in the number of organisational innovations, after controlling for subsidiary age ($R^2 \text{ Change} = .121; F(5, 25) = .77; p > .05$). In the final model, none of the six predictor variables were statistically significant. This means that none of the variables included in the model had a statistically significant impact on the number of organisational innovations implemented.

A post hoc power analysis was also conducted for the organisational innovation regression model, using a sample size of 32 for the statistical power analysis and a total number of six predictors for the calculation. The alpha level used for this analysis was $p < .05$. The post hoc analysis revealed the statistical power for this regression model was 0.29, using an effect size of 0.15. The effect size was calculated as $f^2 = VS/VE$, where VS is the proportion of variance explained by a set of predictors, and VE is the residual or error variance. This shows that there was less than adequate power (i.e. power $< .80$) at the small effect size level. Using an a priori test, the sample size needed to achieve a power of .80 for this small effect size was calculated. The required sample size was $N = 90$. The low power for this regression model could, therefore, be interpreted as an indication of a sample size that was too small to detect the effect obtained.

Table 5.20: Correlations for Continuous Variables

Variables	Number of Organisational Innovations	Subsidiary Age	Autonomy and Teamwork	Support for Change	Risk-Taking	Trust and Openness	Constructive Conflict
Number of Organisational Innovations	1						
Subsidiary Age	.30*	1					
Autonomy and Teamwork	-.10	-.23	1				
Support for Change	-.16	-.59***	.43**	1			
Risk-Taking	-.14	-.45**	.53***	.66***	1		
Trust and Openness	.17	-.17	.61***	.44**	.49**	1	
Constructive Conflict	-.17	-.09	.64***	.34*	.52***	.41**	1

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 5.21: Hierarchical Regression Model of Number of Organisational Innovations

	R	R ²	ΔR^2	B	SE	β	t
Step 1	.30	.09					
Subsidiary Age				.13	.08	.30	1.72
Step 2	.46	.21	.12				
Subsidiary Age				.14	.10	.31	1.33
Autonomy and Teamwork				-.89	2.15	-.11	-.42
Support for Change				-.15	1.70	-.02	-.09
Risk-Taking				-.03	1.42	-.01	-.02
Trust and Openness				2.12	1.27	.39	1.67
Constructive Conflict				-1.34	1.51	-.22	-.89

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

5.3.5.3 Hypothesis 3

Innovation generation was operationalised as the total number of ideas generated for each of the different forms of innovation. Hypothesis 3 was tested by regressing the organisational culture dimensions on the total number of ideas generated, after controlling for subsidiary age. Again, preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. An initial analysis of the correlations of the predictor variables was undertaken. The organisational culture dimension of support for change was only lowly correlated ($r = .069$) with the total number of ideas and was therefore excluded from the regression analysis. Additionally, the correlations amongst the predictor variables (subsidiary age, autonomy and teamwork, risk-taking, trust and openness, and constructive conflict) included in the study were examined and these are presented in Table 5.22. All of these predictor variables were correlated with the total number of ideas. This indicates that the data was suitably correlated with the dependent variable for examination through multiple linear regression to be reliably undertaken. With the use of a $p < .001$ criterion for Mahalanobis distance, no outliers among the cases were identified.

In the first step of the hierarchical multiple regression, the control variable subsidiary age was entered. This model was not statistically significant $F(1, 35) = .07$; $p = .79$ and explained 0% of variance in the number of ideas generated (Table 5.23). In step two the four organisational culture variables were entered. The total variance explained by the final model as a whole was 27% ($F(5, 31) = 2.33$; $p = .07$). The introduction of the four organisational culture variables explained an additional 27% variance in the number of ideas, after controlling for subsidiary age ($R^2 \text{ Change} = .308$; $F(5, 30) = 2.68$; $p < .05$). In the final model risk-taking was statistically significant, recording a beta value of $\beta_{RI} = .49$, $p < .05$. Risk-taking had a positive influence on the number of ideas generated, meaning that subsidiaries that embraced risk-taking generated a larger number of ideas.

A post hoc power analysis was also conducted for the total ideas regression model, using a sample size of 37 for the statistical power analysis and a total number of five predictors for the calculation. The alpha level used for this analysis was $p < .05$. The post hoc analysis revealed the statistical power for this regression model was 0.80, using an effect size of 0.37. The effect size was calculated as $f^2 = VS/VE$, where VS is the proportion of variance explained by a set of predictors, and VE is the residual or error variance. This shows that there is adequate power (i.e. power * .80) at the large effect size level.

Table 5.22: Correlations for Continuous Variables

Variables	Number of Ideas	Subsidiary Age	Autonomy and Teamwork	Risk-Taking	Trust and Openness	Constructive Conflict
Number of Ideas	1					
Subsidiary Age	.05	1				
Autonomy and Teamwork	.14	-.23	1			
Risk-Taking	.39**	-.45**	.53***	1		
Trust and Openness	.35*	-.17	.61***	.49**	1	
Constructive Conflict	.19	-.09	.64***	.52***	.41**	1

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 5.23: Hierarchical Regression Model of Number of Ideas

	R	R ²	ΔR^2	B	SE	β	t
Step 1	.05	.00					
Subsidiary Age				.47	1.72	.05	.27
Step 2	.52	.27	.27				
Subsidiary Age				2.63	1.79	.26	1.47
Autonomy and Teamwork				-44.41	42.55	-.24	-1.04
Risk-Taking				58.87	26.03	.49*	2.26
Trust and Openness				37.73	24.77	.31	1.52
Constructive Conflict				-1.92	29.85	-.01	-.06

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

A chi-square test of independence was performed to examine the relation between the total number of ideas generated and the total number of innovations implemented. The relation between these variables was significant, $X^2(2, N = 37) = 11.20, p < .01$. Multinational subsidiaries that generated a lower number of ideas were less likely to implement innovations than multinational subsidiaries that generated a higher number of ideas.

5.4 Summary

The main objective of this part of the chapter was to report the findings from Phase One of the study. The three sets of hypotheses and sub-hypotheses specific to this phase of the study were tested in separate hierarchical regression models to provide a better understanding of the ways organisational culture impacts on innovation in subsidiaries of multinational ICT organisations. The first model tested the effects of organisational culture on the total number of innovations implemented. In the second application of the model the effects of organisational culture on the number of innovations implemented – across the four forms of innovations investigated (product [goods/services], process, marketing, and organisational) – were tested. The third model tested the effects of organisational culture on the total number of ideas generated. A detailed summary of the hypotheses test results is presented in Table 5.24, followed by a high-level summary of the hypotheses and results in Table 5.25. A preliminary discussion of the findings is provided in the next section of this chapter.

Table 5.24: A Summary of Hypotheses Test Results

Hypothesis	Sub-hypothesis	Dependent Variable	Predictors	Statistically Significant
1. The more the organisational culture emphasises specific dimensions of an innovative culture, the higher the presence of innovation.		Total number of innovations	Subsidiary Age	X
			Autonomy and Teamwork	X
			Support for Change	$\beta_{CHA} = -.56, p < .05$
			Risk-Taking	$\beta_{RI} = .51, p < .05$
			Trust and Openness	$\beta_{TR} = .47, p < .05$
2. The relationship of innovation to organisational culture differs for specific forms of innovation.	a. Organisational culture has an influence on product innovation.	Number of product innovations implemented	Subsidiary Age	X
			Autonomy and Teamwork	X
			Support for Change	$\beta_{CHA} = -.57, p < .05$
			Risk-Taking	X
			Trust and Openness	$\beta_{TRU} = .53, p < .05$
			Constructive Conflict	X
		a) Number of goods innovations implemented	Subsidiary Age	$B_{SA} = .34, p < .05$
			Autonomy and Teamwork	X
			Support for Change	$\beta_{CHA} = -.53, p < .01$
			Risk-Taking	$\beta_{RI} = .40, p < .05$
			Trust and Openness	$\beta_{TRU} = .53, p < .01$
			Constructive Conflict	X

Hypothesis	Sub-hypothesis	Dependent Variable	Predictors	Statistically Significant
		b) Number of service innovations implemented ¹	Subsidiary Age Autonomy and Teamwork Support for Change Risk-Taking Trust and Openness Constructive Conflict	X X X X X X
	b. Organisational culture has an influence on process innovation.	Number of process innovations implemented	Subsidiary Age Autonomy and Teamwork Risk-Taking Trust and Openness Constructive Conflict	X X $\beta_{RI} = .51, p < .05$ X $\beta_{CON} = -.46, p < .05$
	c. Organisational culture has an influence on marketing innovation.	Percentage of marketing expenses assigned to marketing Innovations ¹	Subsidiary Age Autonomy and Teamwork Risk-Taking Trust and Openness	$\beta_{SA} = .47, p < .01$ X X X
	d. Organisational culture has an influence on organisational innovation.	Number of organisational innovations implemented ¹	Subsidiary Age Autonomy and Teamwork Support for Change Risk-Taking Trust and Openness Constructive Conflict	X X X X X X

Hypothesis	Sub-hypothesis	Dependent Variable	Predictors	Statistically Significant
3.	Organisational culture has an influence on innovation generation.	Number of ideas generated	Subsidiary Age	X
			Autonomy and Teamwork	X
			Risk-Taking	$\beta_{RI} = .49, p < .05$
			Trust and Openness	X
			Constructive Conflict	X

¹The power of this statistical test is rather low. The result, therefore, does not lend itself to firm conclusions.

Table 5.25: A Summary of Hypotheses and Results

Hypotheses	Influence					
	Subsidiary Age	Autonomy and Teamwork	Support for Change	Risk-Taking	Trust and Openness	Constructive Conflict
1. The more the organisational culture emphasises specific dimensions of an innovative culture, the higher the presence of innovation.	✗	✗	✓	✓	✓	✗
2a. Organisational culture has an influence on product innovation.	✗	✗	✓	✗	✓	✗
2b. Organisational culture has an influence on process innovation.	✗	✗	✗	✓	✗	✓
2c. Organisational culture has an influence on marketing innovation. ¹	✓	✗	✗	✗	✗	✗
2d. Organisational culture has an influence on organisational innovation. ¹	✗	✗	✗	✗	✗	✗
3. Organisational culture has an influence on innovation generation.	✗	✗	✗	✓	✗	✗

¹The power of this statistical test is rather low. The result, therefore, does not lend itself to firm conclusions.

5.5 Preliminary Discussion

This section presents an initial discussion of the overall findings of the quantitative data analysis. The findings will be discussed in greater detail in Chapter 7 where they will be integrated with those from the subsequent phase of the study.

The main objective of this phase of the study was to examine how organisational culture affects innovation in subsidiaries of multinational corporations in the ICT sector in Ireland. Based on an analysis of existing literature, five specific dimensions of organisational culture were combined into a multidimensional construct of innovation-supportive culture. These are autonomy and teamwork, risk-taking, support for change, trust and openness, and constructive conflict. In addition, four different forms of innovation – product, process, marketing, and organisational innovation – are considered.

Three sets of hypotheses and sub-hypotheses were tested in separate hierarchical regression models in this first, quantitative phase of the study. The results of this phase show that the relationship between organisational culture and innovation is a complex one. For Hypothesis 1, three of the five dimensions of organisational culture (support for change, risk-taking, and trust and openness) had a statistically significant impact on the total number of innovations implemented. For Hypothesis 2, the impact that organisational culture had on the four different forms of innovation varied widely. Support for change and trust and openness had a statistically significant impact on the number of product innovations, whereas risk-taking and constructive conflict were found to be statistically significant predictors for the number of process innovations implemented. None of the organisational culture dimensions had a statistically significant impact on either marketing or organisational innovation. However, for these two forms of innovation the power of the statistical tests was low, so no firm conclusions can be drawn. For Hypothesis 3, risk-taking was the only organisational culture dimension found to have a statistically significant impact on the number of ideas generated.

5.5.1 Hypothesis 1

As indicated earlier, it was hypothesised that the more the organisational culture emphasised specific dimensions of an innovative culture, the higher the presence of

innovation would be. The findings suggest that the specific dimensions of organisational culture investigated in this study do indeed have an impact on the total number of innovations implemented.

It is somewhat surprising that the cultural dimension of support for change registers with a negative β coefficient. Prior studies that noted the importance of support for change as part of an organisation's overall organisational culture, indicated a positive relationship between the support for change in the organisation and the level of innovation (e.g. Prajogo & McDermott, 2011). This study has been unable to demonstrate that. A possible explanation for this might be the subsidiary context this study has been undertaken in. Subsidiary initiative and drive for change might be seen as an act of empire-building (Birkinshaw & Hood, 1998) on behalf of the subsidiary. This view is shared by Delany (2000), who found that the parent company headquarters tend to be initially negative about initiative-taking at the subsidiary level. Subsidiaries that take initiative are likely to be seen as out of control, non-compliant with the parent company's requirements, and serving their own interests. This view is further supported by Ambos, Andersson, and Birkinshaw (2010) who note that headquarters might view subsidiaries' initiative-taking with ambivalence and seek to ensure control over the subsidiary's activities. This could be associated with increased monitoring to ensure that the subsidiary remains compliant with corporate goals. Therefore, subsidiary initiatives may evoke headquarters' monitoring, which in turn decreases the subsidiary's autonomy. It is possible, therefore, that support for change at the subsidiary level has a negative impact on the level of subsidiary innovation because it is associated with an increased level of scrutiny and control over the subsidiary. This phenomenon, that a higher level of monitoring and control of the subsidiary reduces the level of innovation in a subsidiary, is also referred to as the innovation integration dilemma (Mudambi, 2011).

In the case of determining organisational culture dimensions that have an impact on innovation, the findings suggest that risk-taking plays an important role. This finding confirms the association between risk-taking and propensity to innovate found by Kreiser and Davis (2010), who suggest that an atmosphere that accepts mistakes as part of taking the initiative and regards mistakes as learning experiences needs to exist in an organisation that seeks to innovate.

The findings suggest that trust and openness is an important predictor of the total number of innovations implemented. In organisations with a high level of trust and open communication, employees generally feel safe to innovate and a continuous exchange of

ideas supports the innovation process (Baer & Frese, 2003; Ellonen et al., 2008; Kivimäki et al., 2000).

One unanticipated finding was that the dimension of autonomy and teamwork registered with a negative β coefficient. This finding is contrary to previous studies which have suggested that a positive relationship exists between autonomy and teamwork and innovation (Mudambi, Mudambi, & Navarra, 2007). A possible explanation for this might be that participants in this study ranked their perception of autonomy and teamwork not only for the working relationships within the subsidiary but also for those outside of the subsidiary. This could mean that what was captured here was not task autonomy but subsidiary autonomy. Whereas task autonomy would be expected to have a positive effect on innovation, subsidiary autonomy may have a negative one. When a subsidiary assumes autonomy this can result in an increased level of monitoring by headquarters. Consequently, the level of innovation in the subsidiary is impacted negatively.

The finding that subsidiary age, the control variable in this study, had a positive impact on the total number of innovations implemented is in line with that of previous studies (Cohen & Levin, 1989).

5.5.2 Hypothesis 2

Further, it was hypothesised that the relationship between innovation and organisational culture differs for specific forms of innovation. A number of sub-hypotheses were tested to examine this second hypothesis.

5.5.2.1 Hypothesis 2a: Product Innovation

When determining the relationship between organisational culture and the number of product innovations implemented, the findings suggest that risk-taking and constructive conflict had a positive impact. This finding is consistent with those obtained in earlier studies (De Dreu, 2006; Naranjo-Valencia, Sanz-Valle, & Jiménez-Jiménez, 2010).

The finding that trust and openness had a positive impact on the number of product innovations implemented corresponds to the study of Ellonen et al. (2008), who found that trust had a strong impact on product innovativeness.

The organisational culture dimensions of autonomy and teamwork and support for change both had negative β coefficients. This indicates that, after accounting for the other dimensions of organisational culture, those subsidiaries with higher scores on the autonomy and teamwork and support for change dimensions were expected to implement a

lower number of product innovations. These findings are contrary to previous studies which have suggested that both autonomy and teamwork and support for change have a positive effect on the number of product innovations implemented (Hoegl & Parboteeah, 2006; Prajogo & McDermott, 2011). As discussed earlier in this section, the result regarding the support for change dimension may be explained by the subsidiary context of this study. The relationship between autonomy and teamwork and product innovation may also partly be explained by the study context. While the reason for the unexpected result with regard to autonomy and teamwork is not clear, it may be related to the respondents' interpretation of the survey questions for the dimension. Therefore, what may be captured here might not be the level of autonomy and teamwork experienced within the subsidiary but that experienced within the wider MNC context. This perspective may bring related concepts such as subsidiary autonomy to the forefront. Subsidiary autonomy and resulting subsidiary initiatives could be perceived as highly disturbing of the MNC's organisational equilibrium and may, therefore, cause a degree of corporate resistance to the initiatives (Birkinshaw & Ridderstråle, 1999). This resistance may manifest in a negative impact on the number of product innovations implemented.

When splitting product innovation into its two components of goods and service innovation, the results look somewhat different.

5.5.2.1.1 Goods Innovation

The findings regarding the positive impact of the organisational culture dimensions of risk-taking, trust and openness, and constructive conflict on the number of goods innovations implemented are in agreement with those obtained in earlier studies (De Dreu, 2006; Ellonen et al., 2008; Naranjo-Valencia et al., 2010). The control variable subsidiary age also had a positive effect on the number of goods innovations implemented, which is in accord with previous studies indicating that firms implement a higher number of goods innovations as they age (Huergo & Jaumandreu, 2004). One unanticipated finding was that both autonomy and teamwork and support for change had negative β coefficients. While previous studies reported a positive relationship between autonomy and teamwork and support for change and the number of goods innovations implemented in subsidiaries (e.g. Mudambi et al., 2007), this study has not been able to show that. The role the subsidiary has in the overall MNC may matter here. A positive relationship between those two organisational culture dimensions and innovation has been found in dedicated R&D

subsidiaries. These subsidiaries would not only be expected to innovate but be given a clear mandate to do so. Any innovation activities undertaken in these dedicated R&D subsidiaries would, therefore, be expected and welcomed by headquarters. Innovation activities in subsidiaries without such a mandate may not be received in the same manner. Referring back to the discussion in section 5.5.1, initiative-taking at the subsidiary level may result in an increased level of monitoring and control by headquarters, which consequently decreases the subsidiary's autonomy and therefore may have a negative impact on innovation.

5.5.2.1.2 Service Innovation

As mentioned earlier, the statistical power of the service innovation hypothesis test was low, which may lead to failure to detect an effect. Thus, the discussion below of the findings is presented with reservations. There is little guidance on the topic of service innovation in the literature (Lyons, Chatman, & Joyce, 2007), hence the results will mostly be placed within the context of the wider innovation literature.

The current study found that subsidiary age has a statistically significant negative impact on the number of service innovations implemented, indicating that older subsidiaries were expected to implement a lower number of service innovations. This finding is supported by a study undertaken by Balasubramanian and Lee (2008), who found that inertia as a result of ageing tends to curb the innovative productivity of organisations.

The organisational culture dimensions of risk-taking and trust and openness had a positive predictive power over the number of service innovations implemented, which is in line with previous studies (Ellonen et al., 2008; Naranjo-Valencia et al., 2010).

The finding that constructive conflict had a negative impact on the number of service innovations implemented was contrary to previous studies which have suggested that this organisational culture dimension has a positive impact on the number of innovations implemented (Chen, 2006). The result for constructive conflict may be due to the nature of service innovation itself. We can hypothesise that due to the less radical nature of service innovation compared to other forms of innovation (Lyons et al., 2007), constructive conflict does not have the expected impact.

One unanticipated finding was that autonomy and teamwork had zero predictive power over the number of service innovations implemented. A possible explanation for this may be found in the characteristics of service innovation. Service innovations are less likely to

be assigned to a unit or a team in the organisation (Lyons et al., 2007), which may mean that there is a low likelihood of teamwork occurring.

5.5.2.2 Hypothesis 2b: Process Innovation

The finding that risk-taking and trust and openness had a positive impact on the number of process innovations implemented was in agreement with earlier studies (Ellonen et al., 2008; Kreiser & Davis, 2010).

The cultural dimensions of autonomy and teamwork and constructive conflict had negative β coefficients. This indicates that after accounting for the other dimensions of organisational culture, those subsidiaries with higher scores on these two dimensions were expected to implement a lower number of process innovations. The finding that autonomy and teamwork and constructive conflict have a negative impact on the number of process innovation implemented is contrary to previous studies which have suggested that organisations that embrace autonomy and teamwork and constructive conflict implement a higher number of process innovations (De Dreu, 2006; Mudambi et al., 2007). A possible explanation for this result may be the interpretation of the survey questions in this section of the questionnaire. Therefore, as discussed earlier, what may be captured here might not be the perception of these two cultural dimensions within the subsidiary but within a wider MNC context. It is possible, therefore, that related concepts such as subsidiary autonomy may influence the results discussed here. When a subsidiary assumes autonomy through its behaviour, innovation initiatives brought forward by the subsidiary may be met with a significant degree of corporate resistance (Birkinshaw & Ridderstråle, 1999). This resistance may manifest in a negative impact on the number of process innovations implemented.

The control variable subsidiary age was found to have a negative β coefficient, indicating that older subsidiaries were expected to implement a lower number of process innovations. This result is in agreement with Balasubramanian and Lee's (2008) findings, which showed that existence of inertia due to ageing tends to curb the innovative productivity of organisations.

5.5.2.3 Hypothesis 2c: Marketing Innovation

Owing to the low statistical power of the marketing innovation hypothesis test, the findings discussed below may be inconclusive.

The first phase of this study found that none of the organisational culture dimensions had any significant predictive power over the percentage of marketing expenses spent on

marketing innovations. A possible explanation for this result could be the fact that marketing innovation was operationalised in financial terms (percentage of marketing expenses spent on marketing innovations). It could be argued that organisational culture does not have the same impact on financial measures as on non-financial measures. Again, the possible interference of the subsidiary context cannot be ruled out. As marketing innovation is measured in financial terms, it may be that decisions about the level of marketing innovation to be undertaken in the subsidiary are made by the parent company and then transferred to the subsidiary.

While no significant relationships between organisational culture and marketing innovation could be established, the findings suggest that autonomy and teamwork, risk-taking, and trust and openness have a positive impact on marketing innovation. This result is consistent with previous studies (Ellonen et al., 2008; Prajogo & McDermott, 2011).

With regard to the relationship of subsidiary age and marketing innovation, the findings suggest that subsidiary age is a significant predictor. This finding is consistent with that of Kilenthong, Hultman, and Hills (2016) who found that older firms generally tend to have a larger marketing budget and are therefore likely to invest more of their marketing budget in innovations.

5.5.2.4 Hypothesis 2d: Organisational Innovation

The low statistical power of the organisational innovation hypothesis test may have led to inconclusive results. This should be taken into account when considering the following discussion of the findings.

One unanticipated finding was that none of the variables included in the multidimensional organisational culture construct had a statistically significant impact on the number of organisational innovations implemented. Organisational innovation was operationalised as new business practices for organising procedures, new methods of organising work responsibilities and decision-making, and new methods of organising external relations with other firms or public institutions. The result is likely to be related to the subsidiary context the study was undertaken in. Decisions around the three components of organisational innovation as listed above may be undertaken at headquarters level and then transferred to the subsidiary.

While no significant relationships between organisational culture and organisational innovation could be established, the findings suggest that trust and openness had a positive impact on organisational innovation. This result is in agreement with a study undertaken by

Ellonen et al. (2008) who found that trust effectively enhanced organisational innovativeness.

The remaining cultural dimensions of autonomy and teamwork, support for change, risk-taking and constructive conflict registered with negative regression weights. As discussed earlier, this finding is in contrast with earlier studies and likely due to the subsidiary context of this study.

The control variable subsidiary age had a positive effect on the number of organisational innovations implemented, which is in accord with previous studies indicating that firms implement a higher number of organisational innovations as they age (Huergo & Jaumandreu, 2004).

5.5.3 Hypothesis 3

The finding that the cultural dimensions of risk-taking and trust and openness had a positive effect on the number of ideas generated is in agreement with previous studies which found that risk-taking and trust and openness are conducive to creativity and the generation of new ideas in an organisation (Amabile et al., 1996; Clegg et al., 2002). The control variable subsidiary age also had a positive effect on the number of ideas generated. A possible explanation for this may be found in the subsidiary context. In line with subsidiary evolution theory, older subsidiaries may experience a greater level of autonomy with regard to innovation tasks or may be assigned a higher level of innovation tasks as these are activities that would generally be considered to be higher up the value chain.

Surprisingly, the cultural dimensions of autonomy and teamwork and constructive conflict had negative β coefficients. This finding was contrary to that of Amabile, Conti, Coon, Lazenby, and Herron (1996) who found that creativity is fostered in an environment that embraces these cultural values. As discussed earlier, the result that these organisational culture dimensions had a negative impact on the number of ideas generated may be explained by the subsidiary-MNC context this study has been undertaken in.

5.5.4 Context Considerations

The observed differences in the relationship between support for change, autonomy and teamwork, and constructive conflict are thought to be due to the context that this study has been undertaken in. This section discusses some of the contextual variables that may have an impact on the relationship under study.

5.5.4.1 MNC Context

Although certain results from the first phase of this study differ from some published studies (Birkinshaw, 1997; Dobni, 2008), they may be explained by the changing role of the subsidiary. Up until recently, it was assumed that the subsidiary grows in its role as a contributor to the innovation process of the MNC. This assumed relationship between parent companies and their subsidiaries may have changed. Reilly and Sharkey Scott (2013) argue that many subsidiaries now adopt a more narrowly defined, specialised implementer role while also experiencing greater levels of monitoring and control from the parent company. Advances in ICT have made monitoring and control of foreign operations much easier for the parent company. One could argue that having the ability to frequently monitor subsidiary activities in itself encourages tighter control (Scott & Gibbons, 2011). This tendency towards an increasing level of control over the subsidiary may limit the potential of experimentation and initiative-taking at the subsidiary level. There are two ways in which the subsidiary's ability to act in response to local opportunities is reduced. First, the subsidiary's freedom to act on opportunities without first obtaining headquarters' permission is lowered. Second, the increased monitoring by headquarters will reduce the level of slack or unused available resources in the subsidiary system. This combination of decreased autonomy and decreased slack means that both the subsidiary's decision-making ability and its resources to execute them are decreased (Scott & Gibbons, 2011). The more headquarters exercises its right to monitor and control its subsidiaries, the lower the level of subsidiary innovation becomes. This challenge that headquarters experiences when it comes to establishing the ideal level of monitoring and control that still allows for entrepreneurial activities at the subsidiary level is sometimes referred to as the innovation integration dilemma (Mudambi, 2011).

Decreased autonomy might not only result from subsidiary initiative, it may also be affected by the structural organisation of the multinational corporation. Multinationals now have the option to allocate strands of activities from across the value chain to subsidiaries. A subsidiary in a particular location is no longer necessarily a national subsidiary but an amalgamation of a number of different value chain activities. Scott and Gibbons (2011) argue that this breakdown of subsidiary activities into combinations of possibly randomly assigned value chain activities, closely monitored and with little autonomy, substantially reduces the subsidiary's ability to adopt a strategic perspective and to identify how its operation fits within the organisation. This, in turn, reduces the potential for subsidiary initiative as the subsidiary's role will be limited to achieving its value chain activities

efficiently and effectively. It could be argued that disaggregated knowledge only has a limited value and therefore presents a challenge to subsidiaries' capacity to generate initiatives in the first place (Reilly et al., 2012). The resulting internal environment of the MNC could be described as competitive rather than collaborative. Power plays in the MNC could mean that the parent company chooses to become less reliant on the knowledge, ideas, and insights generated at the subsidiary level (Reilly et al., 2012). The focus shifts from one of exploring new opportunities to one of realising short-term certainties. This shift in structural trends in the MNC subsidiary relationship would help explain why the subsidiary's organisational culture has less of an impact on innovation than first assumed. Without a dedicated mandate for innovation from the parent company, the subsidiary is left with little scope for innovation.

5.5.4.2 Geographical Context

Some studies have been undertaken in the Irish context to determine the role of Irish subsidiaries of multinationals or the extent of their mandate (Delany, 1998; Tavares, 2002). Most of the Irish subsidiaries were typed as rationalised manufacturers or rationalised operators, which are rationalised manufacturers with the addition of activities such as software and product developments (Delany, 1998). A rationalised manufacturer can be described as a unit that only produces while being integrated within a wider multinational system and lacking higher functions. In a survey of MNCs in Ireland, undertaken by the Irish Management Institute and Danske Bank in 2013, the strategic role of firms was explored (Irish Management Institute & Danske Bank, 2013). 7% of foreign-owned firms characterised their Irish operation as the strategic centre of a global company. In over half of the foreign firms, the Irish subsidiary was a strategic centre for either a region, a product, or a service, including two-thirds of the US-owned firms. It was the regional centre for the parent organisation or it functioned as a centre for the production of a particular product or service either globally or regionally. The activities of half of these strategic centres were predominantly manufacturing and one-third were entirely services. This shows that the Irish subsidiaries have a rather strictly defined role in the overall MNC network. Approximately one-third of foreign-owned firms had a change in mandate in the period from 2011 to 2013. 50% of respondents tried to win new mandates for their operation in that time frame or are currently trying. Many of these relate to new product development, increased responsibility and management of a European region or function. We could hypothesise that many Irish subsidiaries feel that they need a dedicated mandate in order to increase their responsibilities.

When looking at the ICT sector in Ireland, specifically, one can distinguish between two types of subsidiaries of foreign-owned companies: subsidiaries that represent an amalgamation of different value chain activities and subsidiaries that have a defined innovation purpose, such as R&D and innovation centres (e.g. Microsoft R&D centre and HP Innovation centre). For those organisations that have established both a dedicated innovation centre and a national subsidiary in Ireland, this raises the question as to what extent innovation is an area of focus and priority in the national subsidiary. If innovation activities are delegated to the innovation centre, this could result in a reduced level of innovation activities in the national subsidiary. A possible effect of this could be the development of an environment in the national subsidiary that is less supportive of innovation.

5.5.4.3 Organisational Structures

Much of the implementation of innovation takes place within the organisational setting, in which managers and employees aim to work out the practicalities of a new initiative and attempt to ensure that it is embedded in the practices and processes. There are a number of characteristics which can either dampen or foster innovation in the organisational setting.

Amabile et al. (1996) refer to a set of studies indicating that internal strife, conservatism, and rigid, formal management structures represent obstacles to creativity. Because these factors may be perceived as controlling, they might have a negative influence on creativity by increasing individual extrinsic motivation (a motivation through external factors but not the task itself) and also decreasing the intrinsic motivation necessary for creativity. However, research on impediments to creativity, in comparison to research on stimulants of creativity, is still comparatively limited.

Organisational structures may not only have an impact on innovation implementation and idea generation but also on the culture of an organisation. Linking back to the concept of culture employed in this study, we can view organisational structures as the artifacts in Schein's model of culture – visible representations of the organisational culture. If the organisational structures in place were to stifle innovation, their existence would then also have an impact on the values and the underlying assumptions of the subsidiary's innovation culture as the three levels of culture influence each other. In a case where the organisational structures hinder creativity and innovation, the existence of these structures could be interpreted by organisational members to mean that innovation and creativity are not important to the organisation.

5.6 Strengths and Limitations of Phase One

The strengths and limitations of this phase of the study should be considered before conclusions can be drawn. The main strengths of this phase are the clearly defined sample and the focus on organisational culture in a context that, up to this point, has been relatively unexplored. The main limitations of this survey include the size of the sample and the reliance on self-report measures.

Since the survey used a relatively small sample, power analyses were performed for the individual hierarchical multiple regression models. These analyses revealed that the minimum sample size to detect a large effect ($f^2=0.5$) for a power level of 0.8 and α of 0.05 was 33. Since the sample size used in this study was 37 and thereby exceeds the minimum requirement, it is large enough to perform a meaningful analysis.

The contact person in each organisation was instructed to distribute the questionnaire to a representative cross-section of that organisation's management. It was at the discretion of the contact person at the organisation who to distribute the survey to. This data collection strategy may have introduced some bias into the organisational culture ratings since the contact person might have distributed the questionnaires to like-minded colleagues. However, there is at least some evidence that this might not have been the case. Among other demographic information, respondents were asked to indicate their role in the company. An analysis of this data indicated that managers in various roles within each organisation participated, providing the researcher with some confidence that the contact person followed the instructions.

5.7 Conclusion

This chapter has provided an overview of the quantitative phase of this mixed methods study. The method of data analysis has been described, followed by the findings and a preliminary discussion.

The aim of this phase of the study was to investigate the effects of organisational culture on innovation in multinational subsidiaries in the Irish ICT sector. The findings generally support the view that organisational culture has an impact on the number of innovations that are implemented and the ideas that are generated at the subsidiary level. The evidence from this phase of the study suggests that the relationship between organisational culture and innovation is complex and seems to depend on the form of innovation under investigation. These findings enhance our understanding of how specific dimensions of

organisational culture affect innovation. They also go some way to extend our knowledge of the relationship between organisational culture and different forms of innovation, highlighting that differences do exist depending on the form of innovation under investigation.

This phase of the study has also shown that both innovation and organisational culture are highly contextual. The current data highlights the importance that the subsidiary-MNC context of this study seems to have on the findings. Whereas some of the expected relationships between organisational culture and innovation hold within this context, others do not. Related concepts such as subsidiary initiative, the role of the subsidiary in the MNC, and subsidiary mandates may play an important role with regard to the level of innovation at the subsidiary. These findings add to a growing body of literature on innovation-supportive culture in multinational subsidiaries.

All in all, these findings raise intriguing questions regarding the nature and extent of the relationship between organisational culture and innovation at the subsidiary level and how this relationship is impacted by the MNC-subsidiary context. These questions will further be investigated in the second, qualitative phase of this study.

6 PHASE TWO: IN-DEPTH STUDY & FINDINGS

6.1 Introduction

Miles and Huberman (1994, p. 10) propose that one of the major strengths of qualitative data is that it focuses on “naturally occurring, ordinary events in natural settings”, thereby giving the researcher an insight into real life. One of the uses for qualitative data is to supplement, validate, explain, or illuminate quantitative data the researcher collected from the same setting (Miles & Huberman, 1994). Having chosen an explanatory sequential mixed methods approach for this study, the aim of this second phase is to supplement and explain the findings from Phase One. In order to develop a deeper understanding of the relationship between organisational culture and innovation in multinational ICT subsidiaries and to understand any further contextual factors that may impact this relationship, a more subjective qualitative phase was required.

This chapter presents the qualitative findings of the in-depth study of four subsidiaries which formed the second phase of this mixed methods study. The data collection and analysis strategy is presented first, followed by a description of the demographics of participants. Subsequently, the findings are presented in four themes. The first theme relates to organisational culture and is followed by a theme illustrating the attitude towards and organisational supports of innovation. Further organisational determinants that may impact organisational culture and innovation are considered next. The final theme refers to the headquarters subsidiary relationship. The findings are presented with a preliminary

discussion. Findings are discussed in greater detail in Chapter 7 where they are integrated with the findings from the previous phase of this study.

6.2 Sampling of the Interview Participants

Within this specific sequential explanatory design, the two phases were connected while the selection of participants for the qualitative follow-up analysis based on the quantitative results from the first phase took place (Creswell & Plano Clark, 2011). Only participants that took part in the first, quantitative phase were recruited for data collection in the second, qualitative phase. The scores on the total number of innovations variable were used as a basis for selecting subsidiaries as it was one of the main outcome variables in Phase One. Two subsidiaries were randomly selected from the low total innovation category (1-25 total innovations implemented), one from the medium innovation category (26 – 50 total innovations implemented) and one from the high innovation category (51+ total innovations implemented).

6.3 Data Collection

The primary method of data collection was the semi-structured interview. A semi-structured interview was considered appropriate for this study because it allows for a certain degree of flexibility and the collection of specific data from all participants which aids comparison across cases.

An interview guide was developed for this study. It was designed by transforming issues identified in the analysis of the quantitative data from the first, quantitative phase into questions, which served to investigate the participants' views and perceptions of given topics in depth.

Individual interviews were conducted with four participants, each lasting about an hour. The interviews were recorded and subsequently transcribed. In addition to data collected from participant interviews, documentary information was brought together from company records and from newspapers and reports from government bodies. This proved useful as a way of getting an insight into the development of the subsidiaries since set up in Ireland as well as their involvement in local innovation initiatives.

6.4 Data Analysis

Thematic analysis was undertaken to analyse the interview transcripts in this study. Firstly, the researcher immersed herself in the data to gain familiarity with the breadth and the

depth of the content. The second stage of analysis involved the generation of initial codes from the data. Interview transcripts were examined and relevant extracts from the transcripts were collated to form codes. Once all the data was coded and collated, the third phase of data analysis involved the definition of broad themes. After, the sub-themes from each area were reviewed in the context of the entire dataset, and overarching themes identified. These main themes were then checked against each other, each subtheme, and against the impressions originally documented during familiarisation with the dataset to ensure that they were consistent, coherent, and distinctive.

6.5 Demographics

Top-level executives from four subsidiaries participated in the interviews for this study, one Managing Director, one HR Director, one HR Manager EMEA, and one Head of Innovation Space. Of those, two were female (50%) and two male (50%). All interview participants had been with their respective organisations for more than two years and were therefore in a good position to respond to questions on their respective organisation's culture and innovation activities.

6.6 Findings

Initially, the findings on the descriptions and perceptions of an innovation-supportive culture in the participating multinational subsidiaries are presented. Then, the themes that help explain the findings from the quantitative phase are presented. Themes are supported with extracts from the interview transcripts. These extracts present interviewees' verbatim responses. The major themes and categories are shown in Table 6.1. The chapter concludes with a preliminary discussion of the findings.

Table 6.1: Major Themes and Categories in Interviews of Multinational ICT Subsidiaries

Subcategories	Categories	Theme
Learning about Organisational Culture Design of Office Space	Artifacts of Organisational Culture	Organisational Culture
Openness Risk-Taking Support for Change Empowerment Business-mindedness Authenticity Humility	Organisational Culture Dimensions	
Innovative Culture Learning Culture Hacker Culture	Types of Organisational Culture	
Organisational Culture Development	Changeability of Organisational Culture	
Importance of Innovation Ease of Innovation Understanding of Innovation	Attitude towards Innovation	
Innovation Process/Systems Organisational Structures/Processes relating to Innovation Organisational Culture as Driver of Innovation	Organisational Innovation Supports	Innovation
Scope of Innovation	Innovation Strategy	Organisational Determinants
	Organisational Design	
	Organisational History	
Vision Mission Leadership Leadership Support of Organisational Culture	Strategic Leadership	
	Subsidiary Autonomy	Subsidiary Position in MNC Network
Expectation to Innovate	Subsidiary Mandate	
	Headquarters Subsidiary Relationship	

6.6.1 Organisational Culture

This theme details the findings that relate to the artifacts of organisational culture, the different types of organisational culture, and the organisational culture dimensions that are espoused in the respective subsidiaries. In most subsidiaries, learning about the organisational culture happens by means of an employee induction training and gradual socialisation of employees to the culture through shared values. Subsidiaries increasingly place importance on workspace design.

6.6.1.1 Artifacts of Organisational Culture

Most subsidiaries seem to place a high value on articulating their organisational culture as new employees are required to participate in an induction training that includes an introduction to the global organisational culture and outlines the behaviours that are expected of employees. While some interviewees report that their subsidiaries specifically refer to their organisational culture in their induction training, others refer to their purpose and core values. The values and behaviours that are transmitted to employees at that point tend to be further strengthened by day-to-day exposure to the organisational culture.

Interviewee Company H: But I think that value was transmitted to me from day 1 when I went to my [...] training where I, you know, [...], where you're told, "This is who we are, this is what we do, this is why we do it". So I think that's – that's there from the get-go. And then just by the virtue of the people you work with, you understand that, like, "oh my gosh, I can actually do anything here", you know, and there's no limits to it and there's so much scope to – to build ideas and have support.

When asked about how their employees learn about the organisational culture, an interesting observation was made. One of the organisations made a differentiation between engineers and non-engineers in induction training. The interviewee explained:

Interviewee Company E: Any new engineer that joins [our organisation] will immediately go into what we call boot camp and from day one our engineers are coding straight away and making a difference to, obviously, the platform itself. Obviously, it's supported by mentors and their work will be evaluated as well.

A common view amongst interviewees was that the design of the office space served as another important means to communicate their organisational culture. An open plan office

design and shared spaces that allow for open communication and for employees from different functions to meet were a common consideration. Reminders of the company's values were often an important part of the office design. Overall, the office design was often credited with being an important factor in the organisation's innovativeness:

Interviewee Company C: We're being very deliberate in thinking how do we create the environment and the right kind of visual cues to make it easy and the right kind of way to create more innovation. So, even simple things like locating – finding out where you're going to locate the pool tables or the table tennis area so that you maximise the chance of kind of collisions between people from different disciplines so they can get to know each other and then who knows what might happen.

6.6.1.2 Organisational Culture Dimensions

When asked to describe their respective organisation's cultures, the participants were unanimous in the view that openness was an important dimension of organisational culture. A variety of perspectives on openness was expressed. One informant described the organisation's flat structure and referenced openness between the leadership team and from the executive level down through the organisation. Other participants reported openness in terms of information sharing across the organisation. This was generally seen as a fundamental aspect of an organisational culture that supports innovation. Informants stated that by openly sharing information new ideas and potential for collaboration could be sparked. As one interviewee put it:

Interviewee Company H: There is a culture of transparency which I think is now an understood sort of market leader that people do, certainly in the world of tech ... of just sharing information as much as you can because rather than closing the door you open the plaza and say "Here's all the ideas" and actually you can – your ideas can help another team and it's very prevalent I think in Dublin, specifically because we have so many teams from so many countries and cultures and influences ... that literally sit next to each other, that you're able to actually influence, impact and inspire people on a daily basis just by virtue of being there and sharing ideas.

This view was echoed by another informant who also mentioned the importance of ongoing real-time feedback between peers and colleagues – what is internally referred to as 'hard conversations'. Openness in sharing purposeful feedback was deemed to help

employees have more impact in their role. One individual shared an understanding of openness in terms of an ability to approach anybody with a suggestion and the expectation of the person that is being approached should be open to hearing that suggestion.

Participants also referred to empowerment, support for change, and risk-taking as important facets of their organisational culture. Across all of the interviews, empowerment was generally understood as providing employees with a large degree of autonomy and encouraging them to take initiative. One interviewee argued that creating and providing a working environment in which employees feel comfortable was crucial to employees giving maximum contribution. Informants agreed that empowerment was a very important aspect of organisational culture with regard to supporting innovation. One individual stated:

Interviewee Company H: So I think culturally I think we've always been empowered to innovate and think proactively about how can we make things better and I heard an interesting thought from an engineer here one time who said: "To me, innovation is improving the processes and the stuff that I do so much that in two years' time my job doesn't exist".

And another commented:

Interviewee Company E: I think about – actually the very first slide on the orientation on day one is a sign that says "This is now your company" and in itself what that encourages is that you have individual ownership and scope in which to make a difference and we expect people to have impact from day one and that comes in different guises.

Organisational cultures were commonly viewed as supportive of change and as valuing the related aspect of proactiveness. Interviewees also reported that their organisations had relatively flat organisational structures which made it easier to approach decision-makers. Participants also reported that they had processes in place that ensured that new ideas get heard. A common theme that was mentioned was management support of new ideas. This generally related to openness and approachability of management and an open communication of the high value that was placed on innovation generally and the generation of new ideas specifically. Interviewees also argued that a high degree of proactiveness and initiative-taking was highly valued – as one interviewee commented "asking for forgiveness rather than permission sometimes".

Risk-taking was another dimension that interviewees reported being part of their respective organisational culture. An organisational encouragement of employees to “be bold” and take risks was described as being rather important in relation to innovation. A positive attitude towards failure was reported as an important aspect of the risk-taking process. Interviewees detailed that within their organisations there was an understanding that there cannot be progress without failure and that mistakes should be learned from. As one interviewee said:

Interviewee Company F: And the other – the other quality is not listed as a core value but it’s definitely a – a mantra that we certainly live by as well and that’s that, you know, don’t be afraid to fail, you know there’s no – fail fast and, you know, learn from it. So there isn’t a fear of failure as such, you know as you’re going through discovery with whatever innovation that you’ve come up with.

Interviewees also listed other aspects such as diversity, authenticity, humility, and business-mindedness as descriptors of their organisational culture.

6.6.1.3 Types of Organisational Culture

When asked to describe their respective organisation’s cultures, interviewees referred to specific types of organisational cultures. Interviewees identified an innovative culture as one of those types. Some reported being innovative as one of their corporate values, whereas others referred to their leader’s statement about the necessity of an innovative culture. There was a sense of a real need of an innovative organisational culture amongst the interviewees. One informant commented:

Interviewee Company H: But ultimately if you have a culture of innovation then, you know, there’s medium to long-term gains that we’re not even going to see right now and to build that and foster that sense of unity as a collective I think is what our focus is.

Interviewees also classified their organisational culture as a ‘hacker culture’. One interviewee described hacking as

Interviewee Company E: [...] looking at something, creating something by – by breaking down and building back up greater versions of [it].

Respondents described the hacking process as being most prevalent in the engineering functions but to be expected and happening across all functions. In organisations where

interviewees reported an underlying hacker culture or hacker mentality, they also described office-wide hacks as a cornerstone of their innovation-supportive processes. Hacks were described as events where employees step away from their day-to-day jobs and get together to either solve issues that have previously been identified or to work on particular projects.

One interviewee stated that the culture in his/her organisation could also be described as a learning culture. An example was given for what that meant in practice:

Interviewee Company C: You know, and even you have some of the – probably the most innovative people in the company, they would visit us and they would – one of the things that we would do is - we kind of call it the travel tax for any – kind of the really senior engineers who are kind of like, innovation is their day job, they would come and they would have to do what we call a tech walk and they would share, you know, either their journey, what it is that they've done or talk about the piece of technology that they've developed. So, really trying to create that learning culture.

6.6.1.4 Changeability of Organisational Culture

Respondents made reference to the development and the changes that their respective organisational culture went through. One interviewee reported that at the time of the subsidiary's initial set up in Ireland, there was little to no guidance by headquarters on the desired organisational culture. The subsidiary culture was therefore mainly shaped by the views of the General Manager at the time who placed a high value on empowerment and autonomy.

Another participant referred to changes made to the organisational culture as the organisation matured. While the culture has remained the same at its core, the articulation of some of the values has changed:

Interviewee Company E: Some of the values have changed in that time so I'll give an example – would be 'Move Fast' is an existing value but that used to read Move Fast and Break things' and that was in the spirit of obviously hacking and breaking down and building back up but – and, you know, if you think about this from the perspective from our colleagues in infrastructure, it's not cool for them to break things, you know!

The interviewee also noted that values evolved as the organisation matured and that different teams within the organisation would interpret those values slightly differently.

6.6.2 Innovation

This theme details the findings that relate to the perception of the attitude towards innovation that is held in the subsidiary and the wider MNC and the organisational supports of innovation that are in place. There was a general sense of an appreciation of the importance of innovation and a desire for implementing systems and processes that support innovation. These systems and processes were either less structured and thereby more reliant on the underlying organisational culture or rather rigidly structured.

6.6.2.1 Attitude towards Innovation

6.6.2.1.1 Importance of Innovation

When asked about the importance of innovation to their respective organisation, interviewees reported that innovation was regarded as very important. One individual referred to innovation as the ‘lifeblood’ of the organisation and further commented:

Interviewee Company H: And so I think, yes, at the core we are an innovation company. It is the most important thing to us insofar as we need to constantly be thinking about how to improve and jump forward 10x as they say. Leap forward.

And another commented:

Interviewee Company C: I think the – like, our CEO has said our industry doesn't expect – doesn't respect tradition, it only respects innovation. So I think from the top-down, it's very clear what the focus and the priority is.

Participants also reported that innovation was not only highly valued but also generally encouraged. While one interviewee reported that innovation may be expected in some departments in the organisations, it was encouraged across the organisation as a whole. Innovation tended to be seen as a channel that employees could use to make their own unique contributions. One interviewee said that being innovative was ‘actively encouraged’ and that individuals were rewarded when they have ‘made a suggestion, a recommendation, or come up with a new idea that has been seen through to fruition’. Informants also reported a constant search for ‘new answers’ and a need for ‘continuous improvement’ to be part of the daily reality for the organisations studied. There were comments about a potential perceived higher importance of some forms of innovation than

others. One interviewee alluded to the notion of there being a natural tendency of technology companies to place a high importance on product innovations. Other forms of innovation were regarded as important but would not have the same support in terms of resources and attention.

6.6.2.1.2 Ease of Innovation

In all cases, the interviewees reported that it was easy to innovate in their respective organisation. Reference was made to the existing organisational cultures as a means of supporting innovation activities. One participant commented that the initial idea generation would be easier than the actual innovation implementation. The individual stated

Interviewee Company F: I would say the initial idea part is probably the easiest bit and then taking it to the next level as a – as a, you know, as an innovation does take more work, so, you know, we have – we actually have a process in place that if somebody has an idea, either a product idea or a service idea, that they can – they can put together what we call a pitch-book [...] So, the idea is that you put the, you know, you put down on paper your idea, where you see the market for it, how much work you think might need to be done to achieve the – to achieve a positive outcome and then that goes into a cycle with our R&D team where there's two senior people who review the pitch-book, the person will be invited to present it, they'll go through it and they'll go through it in quite a lot of depth and they will see how it aligns with the company's overall strategy. And, you know, based on the resources that would be required, you know, based on the marketability of the idea they'll make the decision to move forward or not.

Another interviewee also alluded to the notion of innovation being a complex undertaking due to the time and effort that would need to be dedicated to it. It was reported that whereas innovation in its broad definition could be facilitated in employees' daily jobs, breakthrough innovations would be less so. Interviewees noted that large-scale innovations were more likely to be run from corporate headquarters.

6.6.2.1.3 Understanding of Innovation

Participants felt that there was added complexity when it came to understanding what innovation is and highlighted the potential risk of not recognising that one is innovating. It was suggested that there was a general tendency to put more attention on product

innovation than on the other forms of innovation. There was also a general sense of innovation being a concept that is hard to grasp objectively. One interviewee commented:

Interviewee Company H: But I think also it's a term that's obviously very widely used and there's so many interpretations of what innovation is, so if you were to ask ten other people they might have a different version of that but actually what they're talking about is innovation but they may not see it as such, right?

Talking about this issue, when discussing process innovation, one interviewee put it as follows:

Interviewee Company C: The process one is interesting because I think it's hard to differentiate what is, you know, the basics of running a process efficiently in a – kind of a normal maintenance kind of manner and then a subsection then of people may be innovating to make that process more efficient.

6.6.2.2 Organisational Innovation Supports

6.6.2.2.1 Innovation Processes and Systems

When asked about how their organisation supports innovation, the interviewees reported on their dedicated innovation systems and processes and wider organisational structures and processes that were in place to support innovation. Two different approaches to supporting innovation emerged from the interviews: A culturally-based, more ad-hoc approach to innovation and a highly structured approach. The comment below illustrates the first approach:

Interviewee Company E: It may start off with a small team, [...] but it – it might be a case of experimenting with one team and testing if – if that proves successful, you know, maybe increasing the scope of that project and bringing it to beyond the team to a functional level and through discussion with a manager as well, ensuring that we can give it the right amount of attention and resources if we're seeing the impact. I didn't – I don't know if I mentioned one of our other values is focus on impact and there is certainly a culture of who gets prioritisation to focus on the things that are going to have the most meaningful impact and some – in examples like this, if we do see that the test has been very successful it's worth obviously scaling it.

Another interviewee described a much more structured approach:

Interviewee Company F: So once the idea is deemed feasible it goes into our planning, we've a couple of planning tools. So, the first planning tool is [...] more than a – I'm trying to describe it, it's more than a project board, it actually helps us plan our software releases for various different products. So basically, the idea will land in the board first and then it'll get moved around and there'll be some suggestions for what release it could go into, for example. [...] So, that'll come straight in, what'll happen then is the technical product managers will look at it and see what else is on the board, they'll discuss with the – the technical design board what the priorities are and then they'll drop the innovation into the most suitable – suitable release. So it mightn't be – so if it's something that's deemed really, really important it could be out in six weeks. If it's something that's less important, it'll go into a later release. So it could go into a release for six months' time, so it – there'll be two elements to it, it'll be urgency and resources, so "How quickly do we need it?" and "How many man hours do we need to program it? QA it?". So, it'll – they'll find the most suitable slot then based on those criteria. And then from that board, it'll go into another board which is what our development team use, and that's for the guys then to program it.

Some interviewees argued that different forms of innovation were treated the same, whereas one interviewee noted differences between how different forms of innovation were handled. The individual commented that product innovation followed a very structured and streamlined process whereas other forms of innovation were handled on a more ad hoc basis. Once a structured plan was in place, this plan tended to be followed quite rigidly. In one subsidiary concerns were expressed about employees putting forward ideas that would be considered outside their sphere of influence. This was because the channels that would need to be followed to bring that idea to fruition would not be as clear as if that idea stemmed from their area of expertise.

6.6.2.2 Organisational Structures and Processes relating to Innovation

Additional to the specific innovation processes in their organisation, interviewees also shared perspectives on general organisational structures, processes, and initiatives that were put in place in order to support innovation. These ranged from training on intrapreneurship and training on the definition of innovation to courses and workshops

around sparking new ideas. In one subsidiary, the interviewee reported, a talk series in which people shared insights into their creative process and their innovation process had been established. Further, an innovation competition was run at the subsidiary level. The objective of this recurring competition was to draw out all of the innovations that take place across all of the different departments and functions of the subsidiary. This was done in order to recognise and reward the ‘big’ innovations and put executive sponsorship behind them with the aim of developing them further. The interviewee noted that, even with a competition of that scale taking place, employees were sometimes unclear as to what was regarded as an innovation. By putting structures in place, empowering people and making explicit that innovation is valued and ideas can be put forward the subsidiary aimed to communicate to its employees that innovation activities and new idea generation are supported. Interviewees also commented that global or site-wide hackathons were an important factor in how they support innovation. Whereas a global hackathon tended to follow a structured global plan, site-wide hacks tended to be focused on a particular project or pain points that had been identified locally. Both variations were run with the aim of bringing employees together to define the problem and find a way to fix it. One individual, however, reported that this organisational support specifically had become less prevalent as the company matured. Whereas an office-wide hackathon had been run in the early days of the company, now individual teams would run their own hacks. Two of the subsidiaries, as reported by interviewees, also facilitated employees to work on projects that often have no relation to their daily job as a further means of stimulating innovation in the organisation. One informant reported that every department within the subsidiary had initiatives and competitions to support innovation and that all hands meetings were used to demonstrate and broadcast what was happening. It was believed that by openly sharing current initiatives and work that was undertaken, new thoughts, ideas and potential collaborations could be sparked. In one case, the interviewee directly worked with the executive leadership team at subsidiary level to establish innovation targets and goals for the site. The interviewee also worked through questions on how to empower employees to innovate and making explicit the channels to go through as well as understanding how employees initially come up with ideas. In this subsidiary, employees were also rewarded for risk-taking by means of a ‘brave penguin’ award. This award was based on the idea of the penguin who is willing to go to the edge of the ice and jump into the water and explore, while the other penguins wait and see whether he does or does not return.

One interviewee argued that the level of ease and autonomy experienced with regard to innovation depended on the nature of the underlying process. Local processes could generally be innovated on with more latitude, especially when the process leader was located in Ireland and had full accountability of the process and could, therefore, ensure that support can be provided locally. Global processes, on the other hand, could be innovated on by following a specific process that had been put in place. Feedback from the Irish site could then be fed into the existing global process.

There were some suggestions that putting physical frameworks in place was also an important part of how the organisation supported innovation. Interviewees reported that these physical frameworks could either be a dedicated innovation and creativity space or a hack or makers' studio. One subsidiary facilitated innovation labs for both internal and external groups and provided prototyping materials in its dedicated innovation space. In another subsidiary, tools such as soldering irons were provided in the hack or makers' studio so that employees could physically create new items. The importance placed on the physical space is illustrated in the following comment:

Interviewee Company H: I think the other part is the thought and care that goes into the design of the space, the physical space we work in helps a lot to the mental space because even a place like this we're in sends a very strong signal to the work – to everyone who's here, going "We value innovation, in fact, we value it so much that there's a dedicated space that's for only that to go to".

6.6.2.2.3 Organisational Culture as a Driver of Innovation

Another common view was that organisational culture was seen as a driver of innovation. Interviewees felt that it was the organisation's responsibility to create the right environment so that employees feel inspired to innovate. As one interviewee put it:

Interviewee Company H: But then also from the bottom-up there's a huge feeling of people want to contribute and they feel like they have, forgive me for the phrase, but they have the permission to be awesome, you know, they have the permission to do cool s--t!

6.6.2.3 Innovation Strategy

Interviewees also commented on their organisation's respective innovation strategy. There was a sense that the locus of decision-making with regard to the innovation strategy was at corporate headquarters level. One interviewee commented that even though the innovation

strategy was devised at the headquarters level, it still felt like a global effort. While not being directly involved, the Irish subsidiary was still being kept well informed of what was happening and what was expected. In another case, the interviewee reported that the decision on the innovation strategy was made by the head of the Irish subsidiary. In this case, the innovation strategy was arrived at collectively at the site level in collaboration with corporate headquarters.

When describing their innovation strategy process, a similar picture was presented by the interviewees. In most cases, the decisions were made by teams at headquarters level. In all organisations, the innovation strategy was decided collectively. There were a number of different approaches between the different organisations. In one organisation the formulation of the innovation strategy was built on a combination of internal team-based efforts and industry analyses. By reviewing industry trends and forecasts, it was identified where the organisation needed to get to and the innovation strategy was then developed around that. The long-term innovation strategy was then distilled down into three objectives for the organisation to focus on for the year ahead. Another organisation followed a similar process for the formulation of an annual innovation strategy. However, here the vision for the next year was transformed into specific tasks that were then transferred to engineering teams globally. In another organisation, the CFO and the finance team were significantly involved in the formulation of the innovation strategy. Here, the innovation roadmap was set up for three, five, and ten years and the focus was on a definition of business cases around product development and new launches. A common feature of the innovation strategy process across all the organisations interviewed was that the formulation of the innovation strategy was a collective process and was not driven by a single person. Decisions were then made regarding how a localised version of the global innovation strategy can be defined and applied at the subsidiary level. One interviewee commented that at site level innovation goals were included in employee's performance goals.

There were two different views across the cases with regard to the source of innovations in the organisation. Some reported that innovation took place across all departments within the subsidiary, whereas others stated that specific teams were tasked with innovation. One interviewee commented that in their organisation innovation would naturally come from the R&D and the marketing team. In this case, the marketing team was structured quite unusually. It had a project management team within it that was tasked with identifying gaps between what was currently being offered in the market as well as generating ideas

with regard to new offerings. These ideas were then put forward to the R&D team who would, in turn, test them for feasibility.

In all organisations, most of the different forms of innovation were generated and implemented (product, process, and organisational). Marketing and branding, however, were often strictly controlled at headquarters level and headquarters, therefore, were the locus of marketing innovation. One interviewee commented that there actually may be a higher number of employees working on process innovations than on product innovations: 15% of subsidiary employees worked on product innovation compared to 40% on process innovation. Product innovation, however, tended to get more PR and more attention. This view was consistent across the interviews. Interviewees reported that large-scale product innovations were, however, not very apparent out of the Irish subsidiary. Product innovations were more team based. This was ascribed to a stronger engineering presence in the UK than in Ireland. Often structured global plans were put in place in order to generate and implement a specific product innovation, which helps explain the level of attention that is placed on product innovations. However, one interviewee noticed a recent shift in awareness and commented that process innovation was starting to be more widely recognised across the organisation.

Across the interviews, a number of issues concerning the innovation process were identified. Firstly, in some organisations, only a low level of integration between different departments existed. Therefore the innovation process overall was not as efficient as it could be. As one interviewee put it:

Interviewee Company C: But more recently lots of references have been made to kind of streamline the process and become more efficient and more integrated because [our organisation] I guess has grown up as a company that's, you know – it's huge, it's – it's quite siloed in many ways, there's lots of different departments, some are of huge scale and more recently there's been more focus on kind of driving greater integration around kind of process to stop kind of duplication and different teams going off doing their own thing.

Concerns about a bias towards innovation in specific teams were quite widespread. Whereas engineering teams had more latitude and scope to be innovative, contributions from other teams were more focused on process innovation. One interviewee reported that every team in the organisation had its own focus for innovation.

6.6.3 Organisational Determinants

This section details the nature and sources of other organisational determinants that were considered important with regard to supporting innovation. It also includes findings that relate to perceptions of the value of management support of innovation.

6.6.3.1 Organisational Design

The interviewees felt that a flat organisational structure which enables employees to quickly get in contact with decision-makers and signifies a general sense of openness and receptiveness to new ideas was an important factor in supporting innovation in the organisation.

One interviewee mentioned that it was also considered important to get the employees' view on how supportive the organisation is with regard to innovation. In this case, the information was gathered as part of an annual survey on employee engagement that includes a section on how well employees think they are supported on innovation.

Employees also received further support once the organisational innovation themes had been decided. A quarterly review process of the progress made had been put into place. This process included establishing the pace of progress made, gathering information on where employees required more help and support, and feedback on what could be done better.

6.6.3.2 Strategic Leadership

A common view expressed by interviewees was the importance of executive leadership with regard to innovation. In order for everyone in the organisation to grasp just how important an innovation-supportive culture and innovation were to the organisation, leadership often openly communicated this importance and also acted as role models showcasing expected behaviour. One interviewee stated that there was a higher emphasis on culture in the organisation after a change in leadership due to the current CEO describing himself as a culture curator. When referring to the role model function of organisational leaders, one interviewee commented that one of the leaders heading up the innovation team could be described as very open and always encouraging employees to come up with new ideas and to improve processes. Another interviewee reported that there was a high number of executive visits from corporate headquarters to the Irish subsidiary. Visiting executives gathered feedback on activities at the Irish site and then took the information back to corporate headquarters. Leadership support for investments such as dedicated innovation spaces, as discussed earlier, was also described as a way of clearly

communicating the value that leadership places on innovation. In organisations that view innovation as being driven by the organisational culture, interviewees noted a strong emphasis by leadership on culture and ensuring that employees are happy and feel that they are contributing.

6.6.4 Headquarters Subsidiary Relationship

In order to set the context for the interview data relating to the headquarters subsidiary relationship, documentary data from company records, newspapers, and reports from government bodies was collected. Table 6.2 presents information on the original mandate, development of the mandate, and the level of involvement in local innovation initiatives of the four subsidiaries that participated in this phase of the study.

Table 6.2: Characteristics of Subjects for In-Depth Study

Subsidiary	Set up in (year)	No of employees	Original Mandate	Mandate Development	Involvement in Local Innovation Initiatives
C	1985	1985: 100 2017: 1,200 staff + 700 contractors	Manufacturing operation – primarily assembly line work (distribution of software to the rest of the world)	Moved from manufacturing to operational activities and software development Operations now include Sales, Customer Service, Finance, Legal, Server Infrastructure, Marketing, Research and Development, Manufacturing, Operations, Product Development Operations split across the EMEA Operations Centre, the European Development Centre, the Irish Sales and Marketing Subsidiary and the EMEA Data Centre	Provides startups and entrepreneurs with easy access to development tools and server products with no upfront costs Has also partnered up with The National Digital Research Centre, which supports startups with early-stage investment Partner in the Science Foundation Ireland Research Centre For Digital Content Technology and The Irish Software Research Centre
E	2009	2009: 30 2017: 1600	Centre for its international operations – provision of technical, sales and operations support to users and customers in EMEA	Community operations, engineering, infrastructure, social gaming, public policy, recruitment and small and medium-sized businesses teams Undertaking construction of data centre	Implemented own program to foster startups
F	2010	2010: 10 2015: 80	Advanced sales, marketing and customer support from a European base – distribution point for products across the EMEA region	2012: Announced build of its software R&D centre Then came to include quality assurance function Now has operations in software R&D, quality assurance, customer relationship management, marketing and operations	Collaborates with local universities

H	2003	2003: 100 2015: 2800 staff + 2200 contractors	European Data Centre, Multilingual Editing, Customer Support and Financial Shared Services	Sales, Customer Service, Finance, Legal, Marketing, Product Development 2013: Opened a Centre for Innovation	<p>Involved in fostering startups in conjunction with a leading startup hub in Ireland</p> <p>Sponsors a range of research challenges and research awards around the use of technology</p> <p>Partner in the Science Foundation Ireland Research Centre for Future Networks and Communications</p> <p>Has a number of collaboration initiatives with Irish universities, in areas such as recruiting, financial sponsorships, internships, tech talks with students and working with university faculties to develop seminars</p> <p>More recently, has begun expanding research activities in EMEA and is in the process of bringing in research awards for faculties in Europe including Ireland</p>
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In the final part of the interview, interviewees were asked to comment on the mandate the Irish subsidiary had been given by headquarters, the level of autonomy the Irish subsidiary experienced with regard to innovation as well as the relationship between the Irish subsidiary and headquarters.

One interviewee reported that the Irish subsidiary was mandated to innovate, whereas the remainder of interviewees indicated that either only certain parts of their respective Irish subsidiary had a dedicated mandate for innovation or no such mandate existed. In the first case, the organisation as a whole viewed itself as an innovation company, which may be the reason that the Irish subsidiary appears to be well integrated into their innovation activities. In the second case, a dedicated mandate for innovation existed mostly around product innovation and was specific to the engineering teams and not other teams. In this case, the level of innovation taking place at the Irish subsidiary was reported to be not on the same scale as at headquarters. A common view expressed by all interviewees was that innovation was expected. Even in subsidiaries that had no formal mandate for innovation, it was clearly communicated by headquarters that innovation was expected. When asked about their mandate for innovation, interviewees reported that they were actively engaged in innovation activities in the local ICT sector, mostly focused on the support of start-ups. This was seen as a way of enhancing the local ICT sector, providing mentoring to start-ups as well as providing employees with a unique insight into innovation.

A variety of approaches were described in relation to the development of innovative ideas that may be outside of the mandate the Irish subsidiary had been assigned. Interviewees felt that there was a general sense that everyone was encouraged to come up with new ideas and new solutions. They further explained that when employees identified problems that these generally existed across the entire company. The value of the suggested innovation was therefore easy to appreciate. In one of the Irish subsidiaries a strong view existed that, even though no formal mandate for innovation had been assigned, no ideas should get missed. Ideas that were considered critical to the business or strategically important were flagged at weekly leadership calls. The interviewee reported that due to the high level of openness that existed within the subsidiary's teams, the leadership team would know about ideas and support moving them to the next level. An interviewee from a different subsidiary described a similar approach. In the case of ideas that would arise

outside of the mandate, some skunk work and trialling would be done at the subsidiary level and the feasibility of a proposed idea would be assessed. These steps would always be followed before a decision was made on where the idea would be taken in order to receive the level of investment or support that it may need to make it a reality.

Interviewees reported different experiences in relation to the level of autonomy that the respective Irish subsidiaries had with regard to innovation. One interviewee reported 'huge' amounts of autonomy as the Irish subsidiary was the headquarters for EMEA and generally worked collaboratively with corporate headquarters. The interviewee further shared that a number of global leaders were based in the Irish subsidiary and a high number of decisions for corporate headquarters were therefore made from the Irish site. Another interviewee noted differences in autonomy depending on the form of innovation. The interviewee reported that the Irish subsidiary experienced a low level of autonomy regarding products and services as these would largely be corporate decisions. While ideas were generated and the majority of work carried out in the Irish subsidiary, the decision on innovations would ultimately go back to corporate headquarters. The interviewee reported that a larger remit existed with regard to organisational innovations where new ideas could be piloted in the Irish subsidiary. An interviewee in another Irish subsidiary reported a very similar picture. The decision-making around innovation was reported to be quite centralised and organisational innovation was the only form of innovation where the Irish subsidiary would experience a higher level of autonomy. The interviewee noted that the main deciding factor regarding the level of autonomy was where the leader was based and how integrated the system or process was.

In all cases, the informants reported a collaborative relationship between the subsidiary and headquarters. By means of a flat organisational structure and regular communication with the leadership team at headquarters ideas generated at the Irish subsidiaries tended to get heard. Ideas may be implemented and piloted locally first. Once they have proven successful, they could then be passed on to headquarters. One interviewee noted that teams from the Irish subsidiary received input into global planning processes as they may have specialist knowledge on a piece of technology or a piece of the process.

6.7 Summary of Key Findings

6.7.1 Organisational Culture

The findings from this phase of the study suggest that there was a strong appreciation of the link between organisational culture and innovation in multinational subsidiaries in the Irish ICT sector. A common view among interviewees was that it was essential to communicate the organisational culture to employees during their initial days in the subsidiary and through continued day-to-day exposure. The design of the office space was also considered an important means of not only communicating the organisational culture but also a desire for innovation. Organisational culture dimensions such as openness, empowerment, support for change, proactiveness, and risk-taking were reported as descriptors of the organisational culture in the subsidiaries studied. Interviewees further referred to specific types of organisational culture to describe the organisational culture prevalent in their respective subsidiary. These were innovative culture, hacker culture, and learning culture. While innovative and learning cultures are widely used concepts, the concept of a hacker culture is most commonly used in the ICT sector. Interviewees also reported that organisational culture developed over time as the organisation matured and that leadership could have quite a substantial impact on how organisational culture is shaped. Generally, organisational culture was seen as an important factor with regard to innovation. An early introduction to the organisation's culture, as well as day-to-day reminders of the dimensions of organisational culture that are particularly valued, was a common approach reported in this study.

6.7.2 Innovation

Turning now to the findings on innovation, innovation was regarded as very important. The findings indicate that most subsidiaries not only highly valued innovation but also generally encouraged employees to display innovative behaviours. It did appear that innovation was easy in most of the subsidiaries but was considerably impacted by internal innovation processes and systems. Interviewees reported that large-scale innovations were less likely in the Irish subsidiaries than incremental innovations. Concerns were expressed about how well understood a concept as complex as innovation really was. Distinguishing innovations from improvements was cited as an issue, especially with regard to process innovation. A general tendency in the sector to pay more attention to product innovations than process, organisational, and marketing innovations was noted.

The participating subsidiaries had dedicated innovation processes and systems in place, some more loosely defined and more culturally driven and some rather rigidly structured. Likewise, across all subsidiaries, a range of organisational structures, processes, and initiatives was in place to support innovation. These included training on innovation topics, workshops, talks, innovation competitions, and hackathons. There was a shared view across the subsidiaries that these initiatives were a means of effectively communicating that innovation was valued by the organisation. Interviewees also expressed the view that the provision of physical frameworks for innovation was considered important. These were either dedicated innovation or creativity spaces or a hack or makers' studios. Having a physical space for innovation was seen as a manifestation of the value placed on innovation. The interviewees, on the whole, regarded organisational culture as a driver of innovation and commented that providing the right kind of environment for innovation to take place was high on the organisation's agenda.

Interviewees reported that decisions regarding their organisation's respective innovation strategy were made at headquarters level. The Irish subsidiary was generally not directly involved in the process but instead kept informed of the decisions made.

There were two diverging views with regard to the scope of innovation at the subsidiary level. Whereas some interviewees reported that innovation at the subsidiary level took place across all departments, others stated that only specific departments were tasked with innovation.

In their accounts of the different forms of innovation that were undertaken at the subsidiary level, the interviewees commented that most of the different forms of innovation were generated and implemented, with the exception of marketing innovation. This was due to the strict control that headquarters had on marketing and branding. A bias towards product innovation was acknowledged across the interviews. This bias was ascribed to the subsidiaries being members of the ICT sector. This bias was also reflected in the higher level of autonomy with regard to innovation that engineering teams experienced compared to other departments in the subsidiary.

6.7.3 Organisational Determinants

Interviewees generally agreed that a flat organisational structure signals a high level of openness in the subsidiary and this was seen to make it easy for employees to quickly get in contact with decision-makers and further any ideas. The level of support that employees

experienced in the subsidiaries was either established by means of an annual survey or by inclusion in a quarterly review.

There was a general sense of importance around management support of innovation. Managers were expected to act as role models and openly communicate their support of innovation. In one case, this support was reported to be implicit in visits of executive leadership to the Irish subsidiary. In organisations where management placed a strong emphasis on culture, interviewees acknowledged that the organisation viewed culture as central to managing innovation.

6.7.4 Headquarters Subsidiary Relationship

The findings indicate that most of the multinational subsidiaries in this study did not have a dedicated mandate for innovation across their operations. Instead, either individual teams or functions were tasked with innovation. All subsidiaries were, however, expected to innovate, which was reported to be clearly communicated by headquarters. There were cases in which some of the functions in the subsidiary were mandated to innovate but not the subsidiary as a whole. Local management generally initially trialled or piloted ideas in the Irish subsidiary. Once these ideas had successfully been tested for feasibility they were then flagged to headquarters.

Even though a lack of dedicated mandate existed in the subsidiaries in this study, they were all to some degree involved in local innovation activities as reported by interviewees and confirmed by documentation evidence. These innovation activities included university collaborations, fostering startups, and partnering with a national foundation for investment in scientific and engineering research.

The level of autonomy with regard to innovation varied widely between the different subsidiaries. Whereas some experienced a high level of autonomy others only had autonomy regarding organisational innovations with product, process, and marketing innovations quite tightly controlled by headquarters. Across all the cases, however, interviewees reported a collaborative relationship between the Irish subsidiary and headquarters.

Figure 6.1 presents the connections between the different themes and their related sub-themes as they emerged from the analysis.

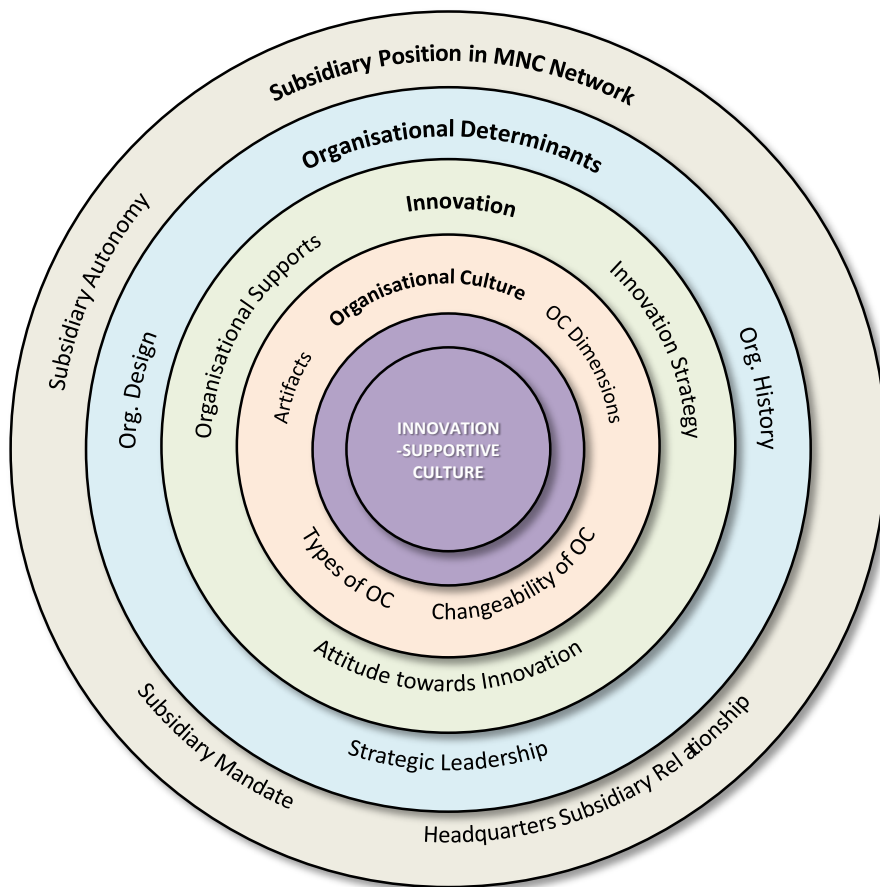


Figure 6.1: Visual Representation of Qualitative Findings

6.8 Preliminary Discussion

Without exception interviewees' accounts of the relationship between organisational culture and innovation in multinational subsidiaries in the Irish ICT sector provide interesting insights.

Participants' descriptions of their respective organisational culture echo previous research related to organisational culture being considered supportive of innovation (Chandler et al., 2000; Jassawalla & Sashittal, 2002). Interviewees' reports that the cultural dimensions of openness, support for change, and risk-taking are especially important with regard to innovation are in agreement with previous studies (Amabile et al., 1996; Cantwell et al., 2007; Jassawalla & Sashittal, 2002; O'Reilly, 1989). In this study organisational culture was often considered a driver of innovation. This view is consistent with previous research conceptualising organisational culture as an antecedent of innovation (Ahmed, 1998; Martins & Terblanche, 2003). The different types of organisational culture that participants reported in their respective subsidiaries are consistent with those reported in earlier studies.

Interviewees' descriptions of their respective organisational culture as an "innovative culture" are in agreement with previous research findings (Chandler et al., 2000; Jassawalla & Sashittal, 2002; Khazanchi et al., 2007). These findings illustrate the organisational culture that tends to be desired in the ICT sector which can be described as placing a high value on creative, innovative, and initiative-taking behaviours of employees, putting trust in all participants of the innovation process and viewing organisational change as necessary. Consistent with Klein & Knight's (2005) findings on learning orientation, interviewees referred to a 'learning culture' as an important aspect of their organisational culture with regard to supporting innovation. A learning orientation is seen to empower employees to engage in experimentation and risk-taking without being held back by a fear of failure. The third term that interviewees used to describe their respective organisational culture, the hacker culture, finds little support in the existing research literature, however. This may be explained by the fact that 'hacker culture' is a specific type of culture that is unique to the sector that this study has been undertaken in. Interviewees described a hacker culture as centring on the process of hacking which can be described as breaking down existing processes, improving them, and finally rebuilding them. A hacker culture is signified by constant change, a high degree of collaboration, and a flat organisational structure. This type of culture allows keeping some of the flexibility that existed in the early days of the sector while also adding a degree of structure that may be needed in the organisational context (Cusumano & Selby, 1997). These findings illustrate a general appreciation by interviewees of the role that organisational culture can play with regard to innovation.

This phase of the study found that innovation was considered either important or very important by all interviewees. This finding is consistent with the role of innovation as a critical source of competitive advantage in today's business environment observed in earlier research studies (Khazanchi et al., 2007; Tushman & O'Reilly, 1996). One unanticipated finding was that interviewees reported challenges with regard to the understanding or definition of innovation. Especially with regard to process innovation, interviewees were not certain how to differentiate between process improvement and process innovation. This became clear when an interviewee referred to Six Sigma, a well-known process improvement system, when asked about their process innovation process. There are, however, a number of distinct and important differences between process improvement and process innovation (Davenport, 1993). The finding that participants were

unsure about the definition of the concept raises the question as to whether some of the innovation activities undertaken in the subsidiaries may have been misclassified given a misinterpretation of the concept.

The number of ideas generated and innovations implemented in the sample for this study have been enumerated in Chapter 5. This quantification, however, does not necessarily provide an insight into the complexities of the innovation process or the level of organisational support that accompanies the process. Nor does it provide an insight into the relationship between headquarters and the subsidiary and the role the subsidiary's mandate may play. These issues arose as important features of the interview data.

The importance of organisational supports for the innovation process is widely reported in published research literature (Damanpour, 1991, 1996; Lam, 2005). Across all of the subsidiaries that participated in this study, an emphasis was put on training and workshops for employees with regard to innovation. This willingness of organisations to further develop their employees further supports the idea that human capital has a positive impact on innovation at the organisational level as found in prior studies (Dakhli & De Clercq, 2004; Wu, Lin, & Hsu, 2007). This is seen to be especially important in the sector under study (Lund Vinding, 2006).

Participants' descriptions of office designs that are strategically planned in order for employees from different departments to meet and that are seen as an important part of supporting innovation, further support the association between office design and interaction. Following nine studies over 12 years, Fayard and Weeks (2011, p. 104) suggest that in order for a space to be effective in supporting interaction, it needs to "bring people together and remove barriers while also providing sufficient privacy that people don't fear being overheard or interrupted. In addition, [the most effective spaces] reinforce permission to convene and speak freely. [...] [G]etting the balance wrong can turn a well-meant effort to foster creative collaboration into a frustrating lesson in unintended consequences." The overall importance of office design was evident in participants' narratives of it supporting certain desired behaviours and serving as a manifestation of their organisational culture. In their study of workspaces for R&D, Sturm and Schimpf (2011) proposed six types of workspaces that are suited to meet R&D needs. Participants

in this study reported the use of the creativity workshop and the prototyping and testing workshop as part of their workspace designs to support innovation. This finding is also in line with Gupta's (2011) suggestion that organisations should set up innovation rooms or laboratories. It also further supports ideas around different types of spaces supporting different types of creative activities (Groves, 2010).

The general strategies that participants used to reward innovative activities are similar to those identified in earlier research (Amabile et al., 1996; Gupta & Arvind, 1993; Hornsby, Kuratko, & Zahra, 2002; Thornberry, 2003). Organisations employed a combination of monetary and non-monetary rewards in order to recognise and boost employees' creativity and innovation. Rewarding employees for being innovative is often regarded as an organisational encouragement of a desired behaviour which in turn continues to motivate employees to engage in that behaviour (Bommer & Jalajas, 2002; Martins & Terblanche, 2003). Participants descriptions of the rewards used exemplify the type of rewards that enhance creativity described by Amabile et al. (1996) in which rewards perceived as a bonus, a confirmation of one's competence, or a means of enabling one to do better and more interesting work in the future can stimulate creativity.

Participant's descriptions of the importance of management support to innovation are generally consistent with research in this area (Amabile et al., 1996; Klein & Knight, 2005), especially with relation to employees' trust in management, a feeling of being supported, and demonstrable management support at the implementation stage. Trust in management is central to innovation in an organisation because employees are more likely to engage in innovation if they can take risks without a fear of failure (Chandler et al., 2000).

Two divergent views regarding innovation management emerged from the interviews. Participants either held the view that organisational culture functions as a driver of innovation or that innovation followed a structured process. While these views are not mutually exclusive they are partially contrasting, which could explain why participants tended to either refer to their organisational culture as the main driver of innovation or referred to their processes as making innovation possible. This finding further supports the idea of two distinct trends in innovation management (Meissner & Sprenger, 2010).

Meissner and Sprenger (2010) identified a higher number of attempts by management to employ linear innovation processes – either derived from literature or from practice – as the first trend. The second trend was a growing acceptance of innovation culture as a driver of innovation. Even when it is not explicitly considered, organisational culture can have a strong influence on the innovation process (Meissner & Sprenger, 2010).

Participants' descriptions of the overall innovation process and the formulation of the innovation strategy presented common themes around the role of top management and headquarters being the locus of decision-making.

The finding that an idea needs to be presented to top management who have the authority to then approve or deny the implementation of the proposed idea, is in line with previous research undertaken by Meissner and Sprenger (2010), who found that the innovation process was characterised by formal power. In this case, an employee putting forward an idea needs diplomacy and sales skills along with creative ability (Meissner & Sprenger, 2010). It could be argued that this formalisation of the process could potentially result in a lower number of ideas being put forward as the formal approval may seem too daunting.

The respective innovation strategies of the subsidiaries in this study were generally decided upon at headquarters level. While some of the subsidiaries had some level of input into the innovation strategy formulation process, in all cases the final decision was made at headquarters level. This is consistent with previous research reporting that it is often headquarters that dominate the decision process for innovation (Fallah & Lechler, 2008). An implication of this is the possibility of subsidiary initiative being suppressed by high levels of decision centralisation (Dimitratos et al., 2014).

Participants' descriptions of the relationship between the subsidiary and headquarters presented an appreciation of collaboration. This finding is in agreement with prior research by Ambos and Birkinshaw (2010) who noted the positive impact of collaboration on subsidiary performance. Subsidiaries that had a high level of strategic choice and also received attention from headquarters tended to perform better than their peers.

Subsidiaries experienced varying levels of autonomy. Whereas the participant in one subsidiary reported high levels of autonomy, interviewees in other subsidiaries reported

autonomy with regard to organisational innovation. There was a sense of product and marketing innovations being tightly controlled by headquarters along with process innovations that fed into a global strategy. This finding seems to be consistent with previous research on subsidiary autonomy which found that the level of autonomy a subsidiary experiences is heavily influenced by the parent company (Boehe, 2007; Dörrenbächer & Gammelgaard, 2006). Ambos et al. (2010, p. 1108) define subsidiary autonomy as “the extent to which subsidiary managers are able to make decisions without headquarters’ involvement”. The extent of autonomy that subsidiaries experience is seen to have a direct impact on the subsidiary’s ability to pursue strategically valuable opportunities (Ambos et al., 2010; Birkinshaw & Hood, 1998). The significance of this connection between subsidiary autonomy and subsidiaries’ pursuit of opportunities becomes clear when the discussion now turns to the participants’ descriptions of their subsidiary mandates.

An interesting finding was that, apart from one subsidiary, the participating multinational subsidiaries in the Irish ICT sector did not have a dedicated mandate for innovation. Despite the lack of dedicated innovation mandate, all interviewees reported that their respective subsidiary was expected to innovate. This expectation of innovation is in support of the popular perspective in the MNC literature depicting the MNC as a globally distributed innovation network (Bartlett & Ghoshal, 1989; Phene & Almeida, 2008). However, previous research shows that without supportive structures in place this expectation of innovation can prove challenging for the subsidiary (Reilly & Sharkey Scott, 2013). Without a dedicated mandate for innovation, the scope to innovate or contribute to the overall MNC becomes difficult. This can be explained by the fact that subsidiary initiatives can be perceived as highly disturbing of the MNC's organisational equilibrium and therefore might cause a degree of corporate resistance to the initiatives (Birkinshaw & Ridderstråle, 1999).

The finding that the subsidiaries in this study engaged in innovation activities in the local ICT sector supports prior research on the external linkages of subsidiaries (Ghoshal & Bartlett, 1990). Boehe (2007) found that units which are only weakly dependent on other units but that other units strongly depend on, have stronger local cooperative links. It is possible, therefore, that the subsidiaries in this study follow this strategy in order to strengthen their position in the overall MNC network. It is also likely that subsidiaries

engage in this behaviour with the aim of extending their mandate as discussed in the next section.

It emerged that subsidiary management initially trialled or piloted ideas in the Irish subsidiary. Once these ideas had successfully been tested for feasibility they were then flagged to headquarters. This behaviour is consistent with Birkinshaw's (1997, 1998) research on initiative-taking which describes that subsidiary managers that are not vested with formal power to exert influence on the innovation process, formulate strategic initiatives to persuade decision-makers of the subsidiary's expertise. These results also corroborate the ideas of Cantwell and Mudambi (2005), who proposed a division of subsidiaries into competence-exploiting and competence-creating types. Most of the subsidiaries in this study engaged in behaviour that was aimed at extending their existing mandate to attain a competence-creating mandate. In the case of the one subsidiary that held a mandate for innovation, it became clear that this had been achieved based on a combination of an accumulation of knowledge around how to progress subsidiary initiatives, support by the parent company, and locational advantages (external networks), which further supports previous research (Cantwell & Mudambi, 2005).

6.9 Strengths and Limitations of Phase Two

Same as Phase One of this study, this phase has particular strengths and weaknesses that must be considered in the context of the conclusions that are drawn. Participants were selected from the sample used in Phase One. The limitations of this sampling frame have already been discussed in Chapter 4. However, every effort was made to sample participants in an objective and representative way. The procedure for selecting interviewees ensured that participants from all ranges of innovation scores were included in this phase of the study which facilitated as broad a perspective as possible.

6.10 Conclusion

This chapter has provided an overview of the second, qualitative phase of this study. The findings of this phase of the study expand the findings from the subsidiaries' survey data obtained in the first phase and complete the sequential explanatory mixed methods design of this study. The findings provide a more comprehensive picture of the relationship between organisational culture and innovation in multinational subsidiaries in the Irish ICT sector, and the number of different ways this relationship is impacted by organisational

determinants and the headquarters subsidiary relationship. The next chapter moves on to integrate the findings from the first and the second phase of this study.

7 DISCUSSION

7.1 Introduction

The purpose of this mixed methods explanatory sequential study was to understand how organisational culture impacts innovation in multinational subsidiaries in the Irish ICT sector. In the first, quantitative phase of the study, three hypotheses and their sub-hypotheses were tested. The data was collected via a self-administered web-based survey. The hierarchical regressions identified a number of organisational culture dimensions that significantly impacted the total number of innovations as well as the number of product, process, organisational, and marketing innovations. Based on the results of the first, quantitative phase, an interview guide was developed and the participants for the qualitative in-depth study were selected.

In the second, qualitative phase, four in-depth interviews were undertaken to explore the results of the statistical tests. Four themes emerged during the qualitative analysis. No other known study conducted on innovation-supportive organisational culture either on individual organisations or on subsidiaries used such a design where both quantitative and qualitative data were combined to assist with providing a more comprehensive answer to a research question. Based on the findings from the quantitative and qualitative phase of this study, a preliminary model of innovation-supportive culture in multinational subsidiaries was developed, which included factors internal and external to the subsidiary that affect an innovation-supportive culture.

7.2 Integrating Quantitative and Qualitative Findings

This section integrates the results of the quantitative phase and the findings of the qualitative phase of this study by first interpreting the results from the quantitative phase and then explaining the findings from the qualitative phase that answered the research questions. This procedure allowed for the findings from the second, qualitative phase to explain and expand upon the statistical results from the first, quantitative phase. The study results were then discussed in detail by grouping the quantitative and qualitative findings related to the dimensions of innovation-supportive culture and the contextual factors that influence it.

The strength of the mixed methods design emerges as the quantitative and qualitative data serve to corroborate and supplement each other.

Guiding Research Questions

Quantitative: What dimensions of organisational culture predict the number of innovations implemented in multinational subsidiaries in the Irish ICT sector?

a) Total number of innovations implemented

Three of the five selected organisational culture dimensions had a significant impact on the total number of innovations implemented. These were support for change, risk-taking, and trust and openness. Contrary to expectations support for change registered with a negative β coefficient.

b) Product Innovation

Two of the five selected organisational culture dimensions, support for change and trust and openness, had a significant impact on the number of product innovations implemented. Contrary to expectations support for change registered with a negative β coefficient.

c) Process Innovation

Two of the five selected organisational culture dimensions had a significant impact on the number of process innovations implemented. These were risk-taking and constructive conflict. Contrary to expectations constructive conflict registered with a negative β coefficient.

d) Marketing Innovation

None of the five selected organisational culture dimensions had a significant impact on the percentage of marketing expenses assigned to marketing innovations. The control variable subsidiary age had a significant impact.

e) Organisational Innovation

None of the selected organisational culture dimensions were statistically significant.

f) Idea Generation

One of the five selected organisational culture dimensions, risk-taking, was statistically significant.

With regard to the total number of innovations implemented, the internet subsector group differed from the hardware and software subsector and the services subsector. There were no significant differences between the hardware and software subsector and the services subsector.

Qualitative: What are subsidiary management's perceptions of innovation-supportive organisational culture dimensions?

What influences the relationship between organisational culture and innovation in multinational subsidiaries in the Irish ICT sector?

The qualitative in-depth study provided an explanation for these quantitative findings. The five dimensions of organisational culture were largely supported by the views of an innovation-supportive culture exhibited in the interviews. The dimensions of organisational culture that the quantitative and qualitative findings highlighted were consistent with Jassawalla and Sashittal's (2002) definition of an innovation-supportive culture which centres on risk-taking, autonomy, and support for change. Three factors affected the relationship between organisational culture and innovation, as reflected by the themes that emerged from the qualitative analysis: 1) innovation-supportive organisational systems and processes, 2) other organisational determinants, such as a flat organisational structure and leadership support, and 3) the headquarters subsidiary relationship. The innovation-supportive organisational systems and processes differentially impacted innovation. Whereas organisational systems and processes that used a cultural approach to innovation management were found to have a favourable impact on innovation, a rigidly structured, formal innovation process may have had a detrimental impact on the relationship between organisational culture and innovation as well as the level of subsidiary innovation. Organisational determinants generally had a favourable impact on innovation. The

headquarters subsidiary relationship may have had an unfavourable impact on the relationship between organisational culture and innovation as well as the level of innovation taking place at the subsidiary level. The positive impact of culturally driven organisational structures and processes found in this study is in agreement with earlier research on ways that an organisation can encourage innovation (Amabile et al., 1996; Kanter, 1988). The influence of the innovation process on the effect of organisational culture on innovation is in line with research undertaken by Meissner and Sprenger (2010) who showed the links between an innovation process and organisational culture and the reciprocal effects they have. The effects of the headquarters subsidiary relationship found in this study are in agreement with previous research highlighting that increased monitoring and control may have a detrimental effect on innovation at the subsidiary level (Reilly & Sharkey Scott, 2013; Scott & Gibbons, 2011).

7.3 Innovation-Supportive Organisational Culture

As part of the subsidiary survey, respondents scored their agreement with statements on the five dimensions of organisational culture included in this study. Data from the survey suggests that on average respondents agreed with the statements on the individual organisational culture dimensions. Autonomy and teamwork scored the highest agreement, with support for change, trust and openness, constructive conflict, and risk-taking following. The interviews revealed that nearly all of these organisational culture dimensions were used to describe the respective existing organisational cultures and were considered to be important with regard to supporting innovation.

The dimensions of organisational culture, autonomy and teamwork, support for change, risk-taking, trust and openness, and constructive conflict, affected innovation in different ways. Risk-taking, trust and openness, support for change, and constructive conflict significantly positively or negatively influenced innovation, while autonomy and teamwork had no significant effect. A number of other cultural dimensions, such as diversity, authenticity, humility, and business-mindedness, were recognised.

7.3.1 Risk-Taking

Most of the respondents had a neutral view of (neither agreed nor disagreed) or agreed with the individual statements on the risk-taking dimension. The hierarchical regression models showed that risk-taking had a significant impact on the number of total innovations

implemented, the number of process innovations implemented, and the number of ideas generated.

The interviews showed that risk-taking was one of the organisational culture dimensions participants used to describe their respective organisational cultures and was considered to be important with regard to supporting innovation. Interviewees cited a positive attitude towards failure and an understanding of failure being an inherent part of the innovation process as important aspects of risk-taking.

These findings were consistent with prior research indicating that risk-taking plays an important role with regard to innovation (Ekvall, 1996; Tellis et al., 2009). A positive impact of risk orientation on innovativeness was also shown in a recent study undertaken by Nystrom et al. (2002). This study's results further support the association between risk-taking and creativity and the generation of new ideas (Amabile et al., 1996). The positive predictive power of risk-taking over process innovation found in this study is in agreement with Baer and Frese's (2003) findings that an organisational culture which embraces risk-taking complements the adoption and implementation of process innovations. An acceptance of failure as a learning experience and a by-product of risk-taking has also been shown to have a positive influence on creativity and innovation (Amabile, 1988; Danneels, 2008). Amabile (1988) further proposed that an individual's risk orientation promotes creativity and therefore has a positive impact on organisational innovation. In a further qualitative study of organisational innovation, Laforet (2011) also found that risk-taking was considered to be related to innovation.

7.3.2 Support for Change

Similar to the risk-taking dimension, most survey respondents either had a neutral view (neither agree nor disagree) or agreed with the individual statements on the support for change dimension. The quantitative analysis showed that support for change had a significant impact on the total number of innovations implemented as well as on the number of product innovations implemented. Contrary to expectations, in this study support for change had a negative β coefficient.

Most of the interview participants reported that they would describe their respective organisational culture as supportive of change and that they considered this an important element for innovation. Interviewees saw a combination of management support for innovation and appropriate organisational structures as ideal in supporting innovation. This

positive view of support for change presented in the interviews differs from the negative impact on innovation found in the quantitative phase.

The outcome of the quantitative phase of this study is contrary to that of Prajogo and McDermott (2011) who found that the support for change in an organisation is positively related to the level of innovation undertaken in the organisation. Top management openness to new ideas and their support and commitment to innovation have also been found to be favourable to the successful implementation of innovation in a qualitative study undertaken by Zain, Richardson, and Adam (2002).

A possible explanation for the differences in findings between the quantitative and qualitative phase of this study may be the interpretation of the individual statements in the support for change section of the questionnaire. Whereas in the interviews the interviewer could ensure that the focus was kept solely on the Irish subsidiary, it is unclear whether the questionnaire respondents retained the same focus. Even though the lead-in to the individual statements in the questionnaire clarified the context, there might still have been some room for misinterpretation that may have led to the resulting survey data being related to interactions between the MNC and the subsidiary instead of just within the subsidiary. As briefly discussed in Chapter 2, management support for new initiatives at the subsidiary level can result in resistance at headquarters. This is because subsidiaries that take initiative are likely to be seen as self-serving and noncompliant with corporate objectives (Birkinshaw & Hood, 1998; Delany, 2000). Headquarters may, therefore, seek to ensure control over the subsidiary's activities (Ambos et al., 2010). This desire for control could result in increased monitoring to ensure the subsidiary's compliance with corporate objectives. Consequently, increased monitoring will reduce the subsidiary's autonomy and in turn reduce its ability to contribute to the MNC (Sharkey Scott & Gibbons, 2010). It can thus be suggested that support for change at the subsidiary level negatively impacts the level of subsidiary innovation as a result of an increased level of monitoring and control over the subsidiary.

The interview findings may further support the argument that support for change has a negative impact on the number of innovations implemented. Interviewees reported that decisions on product innovations tended to be made at headquarters. Additionally, the Irish subsidiaries experienced only a low level of input into the product innovation strategy; in some cases, the Irish subsidiary had no input into the product innovation strategy at all. In general, decisions regarding the global innovation strategy were made at headquarters and then transferred to the subsidiaries. These findings illustrate a distinct preference for

centralised decision-making with regard to innovation across the organisations studied. It is likely that headquarters would have the tendency to monitor and control subsidiaries, as described above, to ensure that global innovation objectives are met.

A common view among interviewees was that top management support was an essential part of the innovation process. In all subsidiaries in this study, some form of management sign-off was needed to progress innovations. In subsidiaries that had a structured innovation process in place, top management sign-off was the most important factor in the process. These findings are consistent with a subsidiary-level study undertaken by Meissner and Sprenger (2013) who found that formal power was the most crucial factor in the innovation process. Without top management support innovations were doomed to fail from the outset as the allocation of resources was decided at the executive level. Similar observations were made in this study when interviewees reported that decisions about resource allocations were made at headquarters. This raises the question about how much formal power actually rests with subsidiary management in the subsidiaries in this study.

7.3.3 Trust and Openness

The quantitative analysis showed that the organisational culture dimension of trust and openness had significant predictive power over the total number of innovations implemented as well as the number of product innovations implemented.

The occurrence of the trust and openness code in the qualitative findings (26.5% of coded segments) showed how much of a focus trust and openness was for interviewees when it came to describing their organisational culture as well as discussing dimensions of organisational culture that they deemed important for innovation. Whereas interviewees did not directly speak to the importance of trust, it was implicit in their descriptions of the role that the character, consistency in behaviour and clear communication of leaders in the organisation played. Interviewees shared a number of different perspectives of the concept of openness, such as flat organisational structure, approachability of leaders as well as their degree of openness with regard to sharing information. Openness and transparency in terms of information sharing were generally seen as a fundamental aspect of an innovation-supportive organisational culture. The interview participants viewed the open sharing of information as a catalyst for collaboration and the generation of new ideas.

These findings match those reported in earlier studies. For example, Ellonen et al. (2008) also indicated that organisational trust has a positive effect on organisational innovativeness. Additionally, trust in the leader's reliability was deemed to be crucial in

supporting the generation of new ideas and the implementation of innovations. Similarly, Baer and Frese (2003) studied the impact of the related construct of psychological safety which describes employees' sense of safety with regard to speaking up and taking risks. They argued for the importance of psychological safety in supporting the implementation of innovations. In their study of communication as a determinant of organisational innovation, Kivimäki et al. (2000) found that open communication and encouragement of initiatives had a positive effect on innovative performance. In a study of innovation implementation, Zain, Richardson, and Adam (2002) found that the organisation that ranked higher on trust and openness was more innovative. This study's findings further confirm this association.

7.3.4 Constructive Conflict

In the quantitative analysis, the constructive conflict dimension had a significant negative predictive power on the number of process innovations implemented.

When interviewees were asked to describe their respective organisational cultures and state which dimensions of an organisational culture they thought were most important with regard to innovation, constructive conflict was not mentioned. It was surprising that the interview participants neither reported constructive conflict as an organisational culture dimension that described their organisational culture nor did they view it as an organisational culture dimension that was seen to support innovation.

These findings are in contradiction with earlier studies which suggested that organisations with a culture that embraces constructive conflict implement a higher number of process innovations (De Dreu, 2006; Mudambi et al., 2007). This is ascribed to constructive conflict leading to a higher level of and a greater diversity of ideas (Danneels, 2008; Kanter, 1988). Constructive challenging of ideas has further been found to have a positive influence on intrinsic motivation which is central to creativity (Amabile et al., 1996). Another study of innovation processes in subsidiaries also found that constructive conflict had a positive influence on innovativeness (Zain et al., 2002).

A possible explanation for this result may be the interpretation of the individual statements on the constructive conflict dimension in the questionnaire. Similar to the discussion in the support for change section of this chapter, what may be captured here might not be the perception of constructive conflict relating to interactions within the subsidiary but that relating to interactions within the wider MNC context. Any form of conflict between the subsidiary and headquarters may have a negative impact on the number of process

innovations implemented. The relationship between constructive conflict and process innovation may also be partly explained by the nature of process innovation. Process innovation as defined by the OECD refers to “new or significantly improved methods of producing goods or services, new or significantly improved logistics, delivery and distribution methods for inputs, goods or services, and new or significantly improved techniques, equipment and software in support activities, such as purchasing, accounting, computing and maintenance” (OECD/Eurostat, 2005). It is likely that final decisions concerning these aspects would be made at headquarters and then implemented in the subsidiaries. Any level of conflict in process innovation related matters with headquarters could, therefore, result in stringent monitoring to ensure that the subsidiary stays in line with corporate objectives.

The fact that constructive conflict was not mentioned in the interviews undertaken is difficult to explain. Presumably, this finding may be due to the negative connotations of the term conflict. All of the organisational culture dimensions that were mentioned during the interviews had positive connotations. Whereas the positive influence of constructive conflict on creativity and innovation has been recognised in previous studies, as indicated above, this may not be the case in practice. This finding is unexpected, especially considering that diversity was one of the factors that interviewees regarded as important in relation to innovation. Diversity has been shown to have a positive impact on creativity as it is seen to result in a wider range of alternatives being considered, more solutions being generated, and an increased level of communication (Pelled, 1996; Shalley & Gilson, 2004). However, diversity has also been shown to bear the potential for conflict as members of a diverse work group may have dissimilar belief structures (e.g. Pelled, Eisenhardt, & Xin, 1999). It is therefore somewhat surprising that the adequate handling of conflict was not considered equally important.

It can also not be ruled out that this finding may be due to the relative newness of the appreciation of positive effects of constructive conflict to industry literature. Whereas the organisational culture dimensions are long established in the academic literature, conflict and the concept of ‘constructive conflict’ as a contributor to innovation has only relatively recently been introduced to the industry literature (for example, Govindarajan & Trimble, 2010; Schwarz, 2015). As a result, this particular dimension of organisational culture may not be as widely accepted in practice.

7.3.5 Autonomy and Teamwork

Respondents' agreement with the individual statements on the autonomy and teamwork dimension was the highest of all the organisational culture dimensions scored in this study. Yet, based on the hierarchical regressions undertaken, autonomy and teamwork did not have a statistically significant impact on any of the forms of innovation under study. Looking at its overall impact, it is surprising that autonomy and teamwork registered with a negative β coefficient.

Interviewees did not directly refer to autonomy and teamwork but instead mentioned collaboration and empowerment. In a literature review on employee empowerment, Honold (1997) identifies teams and collaborative working arrangements, personal responsibility for one's own performance as well as control over decisions relating to one's work as constructs that underpin employee empowerment. Considering this conceptualisation, a considerable overlap between the constructs used in this organisational culture dimension and the concept of employee empowerment becomes apparent. Interviewees considered empowerment as an essential part of their respective organisational cultures. They further reported that employees were generally empowered to take initiative and take individual ownership. Empowerment was the most frequently used organisational culture code in the interviews (28.6% of coded segments), which illustrates the importance the participants placed on this aspect of their organisational culture.

The outcome of the quantitative analysis that autonomy and teamwork had a negative impact on innovation is contrary to previous studies which found a positive relationship between autonomy and teamwork and innovation in subsidiaries (Mudambi et al., 2007). Independence in actions was also found to positively influence innovation in a study undertaken by Zain et al. (2002).

A possible explanation for this inconsistency might be that respondents scored their level of agreement with the individual statements on this dimension not only for the working relationships within the subsidiary but also for those outside of the subsidiary. Therefore, it may be the case that instead of employee autonomy the concept of subsidiary autonomy was captured here. When a subsidiary assumes autonomy this can result in an increased level of monitoring and control by headquarters to ensure that the subsidiary adheres to corporate objectives. As a result, the level of innovation in the subsidiary may be negatively impacted.

Another possible explanation for this might be that the terminology used in the survey led to a potential misinterpretation of the individual statements to be scored. Following the observations of terminology use made during the qualitative phase of this study, a different use of the concept of autonomy seems apparent. In the qualitative phase, the concept of ‘autonomy’, which was measured in the quantitative phase, was only used to describe subsidiary autonomy. Instead of using the concept of autonomy to describe the individual freedom that employees experienced, interviewees used the concept of empowerment. Consequently, these differences in the use of terminology might have resulted in a potential misinterpretation.

As part of the interviews, participants also described their organisational cultures as innovative cultures. They referred to how their cultures nurtured creativity and innovation in employees. This description further supports prior research that found that innovation-supportive cultures can foster such behaviour in organisational members (Jassawalla & Sashittal, 2002).

7.4 Contextual Factors

In the preliminary discussion of the quantitative results in Chapter 5, some questions arose as to how far the observed differences in the influence of some of the organisational culture dimensions on innovation are a result of the context that this study has been undertaken in. The next section supplements and expands the discussion from Chapter 5 through the integration with qualitative data to further shed light on these contextual factors.

7.4.1 Innovation-Supportive Organisational Systems and Processes

Two opposing views regarding the management of the innovation process emerge from the interviews. Interviewees either rely on a defined and structured innovation process or an innovation-supportive culture to aid innovation. In cases where a structured innovation process is in place, an employee needs to progress his/her idea through a number of different stages before it then receives a final check for feasibility and resources and is finally forwarded to top management for sign-off. This process could be characterised as lengthy and time-intensive, with one interviewee even referring to it as “hard work” (Company F). This structured process – while seen as efficient and effective – also has a number of potential drawbacks. Previous research proposed that rigid, formal management

structures may represent an obstacle to creativity as they may be perceived as controlling and therefore have a negative influence on creativity (Amabile et al., 1996). The potential negative influence is two-fold: employees' extrinsic motivation may be increased and the intrinsic motivation necessary for creativity may be decreased. Comparing the findings from the qualitative phase with the results from the quantitative phase, it becomes apparent that the subsidiary with the strictest innovation process implemented the lowest total number of innovations. It is interesting to note that in this subsidiary most of the ideas that are generated are then implemented as innovations (92%). It seems possible that due to the fact that there is a rather rigid process in place only those ideas that have obvious potential are put forward since there is a high degree of work involved in progressing ideas through the different stages of the process. In contrast, the subsidiary that implemented the highest number of innovations over the time period studied also generated the highest number of ideas. This finding is in agreement with that obtained by Clegg et al. (2002), who found a positive association between the number of ideas employees had suggested and the extent to which these ideas were implemented. The subsidiary that implemented the highest number of innovations in this study converted 36% of ideas compared to 92% in the least innovative subsidiary. This finding might seem counterintuitive at first but can be explained by the range and number of ideas proposed. As briefly alluded to above, one could assume that in an organisation that is characterised by a formal innovation process and requires ideas to progress through a number of defined stages before sign-off, employees would only propose ideas that have obvious potential and are considered in line with existing corporate goals. While this might result in a lower absolute number of ideas being proposed, it is likely that the percentage of proposed ideas that are implemented would be rather high. On the other hand, in an organisation with a rather free-flowing and less rigid innovation process, the ideas that are proposed are likely going to be of a wider variety. While the absolute number of ideas that are generated is likely to be considerably higher than in the previous case not all of the proposed ideas are going to be aligned with corporate goals or feasible to implement. Consequently, a larger percentage of ideas are likely to be discarded which is reflected in the lower rate of implementation shown above. The higher number of ideas proposed and the lower rate of implementation, in this case, could, therefore, be due to ideas being of a wider variety and potentially more creative. This finding seems to be consistent with previous research that found that creativity and implementation are only loosely connected and influenced by contextual factors such as an employee's personal drive to see his/her idea implemented (Baer, 2012).

Another factor that may influence the amount of innovation undertaken at subsidiary level is the need for final sign-off by top management. As final sign-off by top management is the deciding factor as to whether an innovation will go ahead or not, formal power consequently becomes the most important element of the innovation process. According to the interviews, this final decision would likely not be made at subsidiary level but at headquarters. This means that the locus of decision-making is even further removed from the origin of the proposed idea than if the decision-making authority rested with subsidiary management. Interviewees also reported that once an idea had been signed off and a plan put in place to implement the innovation, this plan would be followed quite rigidly. This again shows the importance of the final step of top management sign-off. This finding is in agreement with previous research that found formal power to be central to the innovation process in a subsidiary (Meissner & Sprenger, 2010).

The formality of the innovation process portrayed in some of the interviewees' descriptions raises questions. Whereas an employee might be aware of the channels that need to be followed to bring an idea within his/her area of expertise to fruition, the employee might find it more difficult to propose ideas outside of that area. It could be argued that employees might not be able to tap their creative potential and therefore not fully contribute to the organisation when they are implicitly restricted to engage in innovative behaviour with a focus on their area of expertise.

The nature of the innovation process and the organisational culture may also mutually influence each other. Based on Schein's model of culture, organisational structures and processes can be viewed as artifacts of the organisational culture. If the organisational structures and processes in place were to stifle innovation, this would, in turn, have an impact on the values and underlying assumptions in the subsidiary. In a situation where organisational structures and processes impede creativity and innovation, the existence of these structures and processes could be interpreted to mean that innovation and creativity are not important to the organisation. Simultaneously, the organisational culture can also have a considerable impact on the structured innovation process. Should cultural issues occur they can strongly influence the entire innovation process (Meissner & Sprenger, 2010).

The key points arising with regard to the innovation-supportive organisational systems and processes can be summarised as follows:

- Two approaches to managing the innovation process can be identified – either a structured and defined innovation process or a reliance on an innovation-supportive organisational culture. It needs to be noted that rigid formal structures can impede creativity and innovation.
- Innovation needs to be signed off by top management in headquarters, making formal power the most important element of the innovation process for subsidiaries.
- The formality of the innovation process may make it hard for employees to propose ideas outside their area of expertise.
- Organisational culture and organisational structure mutually influence each other which highlights the importance of an alignment between the values espoused in the organisational culture and the nature of the organisational structure.

These key points indicate a number of areas for consideration with regard to organisational systems and processes to support innovation in subsidiaries. They also provide a starting point for an evaluation of these systems and processes.

7.4.2 Organisational Determinants

This study finds that the subsidiaries are characterised by a flat organisational structure. In interviewees' reports, this type of structure is considered an important factor with regard to innovation as it seen to enable open communication and timelier decision-making. This finding is consistent with that of Kanter (1988) who found that integrative structures support innovation whereas hierarchical structures present an impediment to innovation.

The findings from the qualitative phase of this study show the importance that interviewees place on leadership support for innovation. Leaders' communication of the importance of innovation to the organisation combined with modelling behaviour that is in line with what they have previously communicated as well as expected behaviour in the organisation. This finding is in agreement with Klein and Knight's (2005) findings which showed that management support is a critical factor, especially in the innovation implementation process. Strong, convincing, informed, and demonstrable management support leads employees to grasp the importance the organisation places on innovation. Ellonen et al. (2008) found that trust in the leader's reliability was critical as a means of support for the reception of new ideas and innovation. The importance of leaders as role models and supporters and initiators of innovation in organisations is in line with previous studies that emphasised the critical role of management in organisational innovativeness (Amabile,

1988; Kanter, 1988). The importance of leaders modelling certain behaviours noted in the interviews corroborates the ideas of Martins and Terblanche (2003) who argued that innovation-supportive behaviour, e.g. mistake-handling, idea-generating, risk-taking and the encouragement of change, leads to organisational creativity and innovation.

The key points arising related to organisational determinants can be summarised as:

- A flat organisational culture is a key element in supporting innovation.
- Support from top management is a key aspect of an innovation-supportive organisational environment. It illustrates desired behaviours and gives legitimacy to employees' adoption of those behaviours.

7.4.3 Headquarters Subsidiary Relationship

The results from the quantitative phase have given rise to the view that the MNC context and the headquarters subsidiary relationship, especially, have an influence on the effects of organisational culture on innovation observed in this study.

Recent contributions to the MNC literature have suggested that the previously assumed relationship between subsidiaries and headquarters has changed (Reilly & Sharkey Scott, 2013; Scott & Gibbons, 2011). Contrary to growing in their role as contributors to the innovation process of the MNC, it is proposed that many subsidiaries now find themselves adopting more narrowly defined, specialised implementer roles whilst also experiencing greater levels of monitoring and control from the parent company. The findings from the qualitative phase of this study seem to further support this idea. Interviewees' narratives show that headquarters generally seems to exert a high level of control over subsidiaries especially with regard to innovation. Interviewees' reports further highlight varying levels of subsidiary autonomy. In most subsidiaries, product and marketing innovations are tightly controlled by headquarters as are process innovations that form part of a global strategy. These findings are in agreement with previous research that found that the level of subsidiary autonomy was heavily influenced by the parent company (Boehe, 2007; Dörrenbächer & Gammelgaard, 2006). It is striking that in this study, the subsidiary that reported the highest level of autonomy also implemented the highest number of innovations. This subsidiary also devised its own innovation strategy which was then communicated to headquarters and implemented in the formulation of the global innovation strategy. Any adjustments necessary to the original subsidiary innovation strategy were agreed upon in collaboration with headquarters. These findings are consistent with other research which found that the level of autonomy that subsidiaries experience

may be an important factor in how innovative they are and whether they put forward initiatives (Ambos & Birkinshaw, 2010; Birkinshaw & Hood, 1998).

This study indicates that in most cases contributions that are brought forward by the subsidiary require sign-off at headquarters level. The MNC innovation process presents itself as a tightly coordinated global process that is characterised by integration and formal power. The formulation of the global innovation strategy is usually undertaken at headquarters level and then transferred to the subsidiaries. If they have a specific area of expertise, the subsidiaries might contribute to the innovation strategy formulation process. Decisions on the allocation of resources, both in terms of manpower and investments, are also made when the global innovation strategy is formulated. Corporate innovation goals are then transferred to the subsidiary. As a result of this process, the subsidiary may be left with little scope to innovate and move on opportunities that it has identified. These findings seem to be consistent with prior research that argued that a high degree of global integration leads to a reduction in innovative activity (Jarillo & Martinez, 1990). Conversely, Marin and Bell (2010) found that subsidiaries with high levels of global integration demonstrated high levels of local innovative activity. Verbeke (2009), however, suggests that a high degree of global integration and local responsiveness is somewhat idealistic. Similarly, recent research by Meyer and Su (2015) found that most multinationals will need to make a choice between global integration and local responsiveness.

The structural organisation of the MNC might also have an impact on the level of subsidiary initiative. Upon review of the additional data collected during the qualitative phase, it becomes apparent that the subsidiaries in this study were initially tasked with support activities for a local geographic area. Over time, their mandates developed and expanded to include a wider variety of value chain activities. In most of the subsidiaries, research and development or product development are now included as part of their activities. Findings from the interviews show that it is these pockets within the subsidiary that are generally tasked with innovation. These findings further support prior research that argued that MNCs have the option to allocate strands of activities from across the value chain to subsidiaries (Reilly & Sharkey Scott, 2013). A study undertaken by Pedersen (2006) found that headquarters retains the discretion to make decisions over the scope of subsidiary activities. The findings from this study are in agreement with this observation of headquarters behaviour. The development of subsidiary mandates to include R&D functions found in this study is in line with a trend of establishing a network of tightly

controlled R&D units outside of the home country observed by Gassmann and von Zedtwitz (1999).

The findings from this research show that innovation is expected from the subsidiaries. This expectation seems to be somewhat in conflict with interviewees' reports that innovation is easier in functions or departments that have been transferred a specific set of innovation tasks in line with the global innovation strategy. This raises questions as to how well subsidiaries can fulfil this expectation of innovation if innovation is perceived as more difficult to implement when it does not feed into a global strategy. Even in those functions or departments that have innovation tasks transferred to them, they tend to be headquarters assigned. One could argue that the subsidiary is therefore not substantially involved in the innovation process. This finding seems to be in agreement with a study undertaken by Scott and Gibbons (2011) that found that the structural organisation of the MNC combined with close monitoring and little autonomy, substantially reduces the subsidiary's ability to adopt a strategic perspective and to identify how its operation fits within the organisation. As a result, the subsidiary is left with little scope for innovation without a dedicated mandate for innovation from the parent company.

One interesting finding is that even under the existing constraints discussed in the preceding paragraphs the subsidiaries in this study find a way to engage in innovation by trialling and piloting ideas locally. The initial stages of these local innovation activities are completed under the radar of headquarters. Only when a trial has been successful at the subsidiary level, is it then put to headquarters as a suggestion that could be leveraged across the MNC. This behaviour is in support of prior research on subsidiary initiative that found that subsidiary managers that are not vested with formal power to exert influence on the innovation process formulate strategic initiatives to persuade decision-makers of the subsidiary's expertise (Birkinshaw, 1997; Keupp & Gassmann, 2009a). As resource allocation for corporate innovation goals is undertaken at headquarters, these subsidiary initiatives would have to be within the subsidiary's budget because they would form part of the global innovation strategy. It appeared from the interviews that subsidiaries also engaged in innovation activities in the local economy. This finding is in support of prior research on the external linkages of subsidiaries (Ghoshal & Bartlett, 1990). It can be hypothesised that the subsidiaries in this study follow the above strategies to strengthen their position in the overall MNC network and with an aim of extending their mandate. Together, these findings confirm the ideas of Cantwell and Mudambi (2005) who distinguished between competence-exploiting and competence-creating subsidiaries. Most

of the subsidiaries in this study engage in behaviour that is aimed at increasing their competencies and extending their existing mandate. In the case of the one subsidiary that holds a mandate for innovation, it became clear that this had been achieved based on the combination of an accumulation of knowledge around how to progress subsidiary initiatives, support by the parent company, and locational advantages (external networks), which further supports previous research (Cantwell & Mudambi, 2005).

The key points arising with regard to the headquarters subsidiary relationship can be summarised as:

- Headquarters exhibit a tendency to tightly control subsidiary operations, especially with regard to innovation.
- Subsidiary autonomy is a key component of subsidiary initiative and innovation at the subsidiary level.
- The MNC innovation process is tightly coordinated and characterised by integration and formal power.
- Innovation in subsidiaries is dependent on the existence of a mandate for innovation or the assignment of innovation tasks to the subsidiary by headquarters. This shows that headquarters retains the power to make decisions over the scope of subsidiary activities.
- Innovation is expected from subsidiaries even though they experience a limited scope to engage in innovation.
- Subsidiaries engage in subsidiary initiatives under the radar of headquarters. Ideas that are trialled and piloted locally are only put forward to headquarters when they have been successful.

The points listed above indicate the different ways in which the headquarters subsidiary relationship impacts the level of innovation undertaken by subsidiaries.

To conclude this section, it is interesting to note that the subsidiary with the highest level of innovation in this study 1) had an organisational culture that was strongly supportive of innovation, 2) exhibited strong management support for innovation, 3) held a mandate for innovation, 4) implemented organisational supports such as a physical space for innovation and innovation competitions, 5) had the freedom to define innovation strategy at the subsidiary level and feed this strategy into the global innovation strategy and 6) had strong external linkages with the local innovation ecosystem. It can, therefore, be assumed that a

combination of these factors has a positive influence on the level of innovation exhibited by subsidiaries. This finding also highlights the complexities of innovation at the subsidiary level.

7.5 The Model of Innovation-Supportive Culture in Multinational Subsidiaries Revisited

Based on the findings from the quantitative and qualitative phases of this study, the preliminary model of innovation-supportive culture in multinational subsidiaries was refined and expanded (see Figure 7.5). This model now includes factors internal and external to the subsidiary (headquarters and host country environment) that affect the relationship between organisational culture and innovation in the subsidiary and which could form the basis for further empirical testing of the findings.

This study's findings illustrate that specific dimensions of organisational culture differentially affect innovation in subsidiaries. The relationship between organisational culture and innovation in subsidiaries, as well as the level of subsidiary innovation, is affected by organisational systems and processes that may support innovation, other organisational determinants, such as management support, and the headquarters subsidiary relationship.

Considering the factors internal to the subsidiary first, the solid boxes in Figure 7.1 represent the core concepts of organisational culture and innovation and the solid arrow line represents the effects of the five dimensions of organisational culture on the level of innovation in subsidiaries. Organisational culture comprises the dimensions of autonomy and teamwork, support for change, risk-taking, trust and openness, and constructive conflict. The broken box outlines represent four other factors internal to the subsidiary with broken arrow lines indicating the effects these were found to have on the relationship between organisational culture and innovation as well as the level of innovation at the subsidiary. These internal factors included organisational structure, subsidiary initiative, subsidiary mandate, and subsidiary autonomy. Two other factors internal to the subsidiary were added to the model following the qualitative analysis: management support and the innovation process. Dotted outlines highlight these factors in the model and dotted arrow lines represent the effects of these factors on the relationship between organisational culture and innovation as well as the level of innovation at the subsidiary.

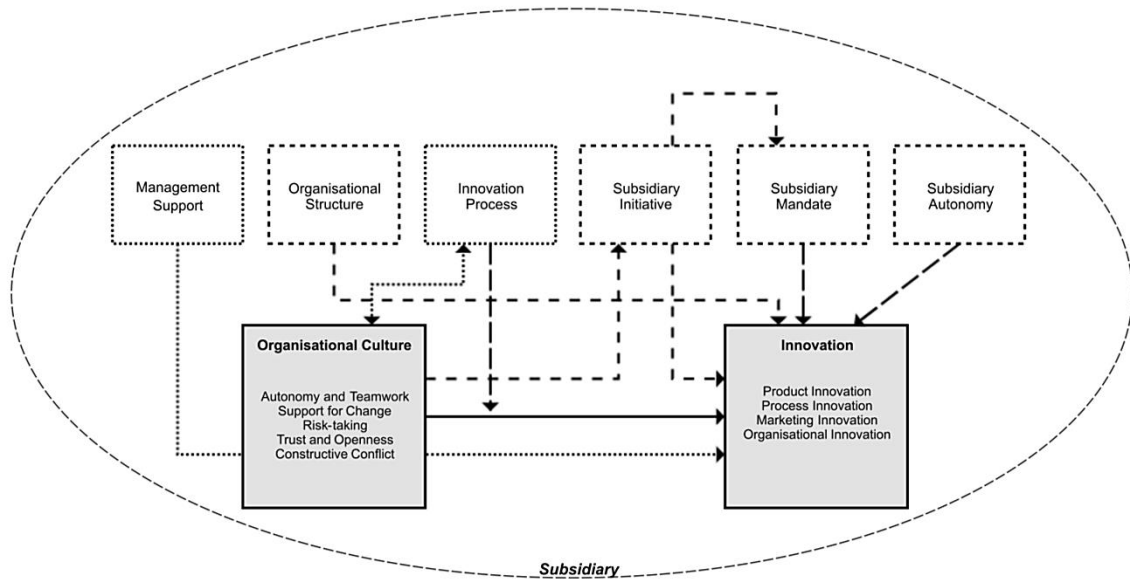


Figure 7.1: Model of Innovation-Supportive Culture – Internal to the Subsidiary

As the subsidiary internal framework illustrates, organisational culture does not only have a direct impact on the level of innovation in the subsidiary but also an indirect impact through its effect on subsidiary initiative. An innovation-supportive culture in a subsidiary promotes subsidiary initiative which in turn has a positive effect on the level of subsidiary innovation (Birkinshaw et al., 1998; Birkinshaw & Ridderstråle, 1999) as indicated by the findings of this study. The mandate a subsidiary holds also affects the level of innovation it engages in as does the level of autonomy that it experiences. The findings showed that the subsidiary that held a dedicated mandate for innovation engaged in a higher level of innovation, as did the subsidiaries that experienced a higher level of autonomy. Moreover, the findings illustrate that subsidiaries often engage in subsidiary initiatives with the aim of extending their subsidiary mandate (Birkinshaw & Hood, 1998). The flat organisational structure of the subsidiaries, which is characterised by a sense of openness and easy access to decision-makers, also had a positive influence on the level of subsidiary innovation as it encourages the exchange of ideas. Management support has also been identified as a factor internal to the subsidiary that has an influence on the generation and implementation of innovations. In the subsidiaries studied, managers were expected to act as role models and openly communicate their support of innovation. The final factor is the innovation process, which influences the impact that organisational culture has on innovation. The findings from the qualitative phase of this study highlighted the existence of two distinct approaches to the management of the innovation process: a structured approach and a culturally based approach. A detailed view of these two approaches to the innovation

process is provided in Figure 7.2. Interviewees described the structured approach as following a number of stages, beginning with the development of an idea into a formal proposal. This proposal is then reviewed by the top management team. Should the proposed idea not align with the corporate strategy, it is discarded. If the proposed idea, however, aligns with the corporate strategy, the idea enters the planning stage. A technical team undertakes another review of the proposed innovation and plans its implementation. The implementation of the innovation represents the last stage of the structured innovation process. A rigidly structured innovation process may negatively influence the relationship between organisational culture and innovation by presenting an obstacle to creativity (Amabile et al., 1996). This is reflected in the finding that the subsidiary with the strictest innovation process implemented the lowest total number of innovations. A cultural approach to innovation relies on organisational culture as the driver of innovation and therefore does not consist of defined stages. The interviewees in this study were, however, rather consistent in their descriptions of the cultural approach. The culturally-based innovation process generally begins with the testing of an idea in a small team within the business. If the idea is unsuccessful, it is discarded. If the test of the idea is successful, however, the scope of the project is increased and the idea is tested at a larger scale. If the larger-scale test of the idea is unsuccessful, the idea is discarded at this stage. If the test has been successful, subsidiary management is informed of the successful test and considers the potential benefit of a business-wide implementation of the idea. It is with the support of subsidiary management that the successful innovation project is then shared with headquarters management for potential implementation across the MNC as a whole. Two distinct differences between the approaches emerged from the interviews. First, top management sign-off occurs at different stages of the respective innovation process. Whereas with a structured innovation process, formal sign-off represents the most important element of the innovation process as it determines whether an idea progresses through the different stages of the process, in a culturally based innovation process the formal sign-off generally takes place once the idea has proven successful. Second, the nature of the innovation process seems to have an influence on the type of ideas that progress through the different stages of the innovation process. As part of the structured innovation process, it is established whether the idea aligns with corporate strategy. This raises the question whether ideas that, at first glance, are not seen as in line with corporate strategy are discarded at this stage even though they may still be of benefit to the business. Organisational culture and the innovation process also influence each other. If the values espoused in the organisational culture are not in agreement with how the innovation

process is structured, organisational members may come to doubt the organisational culture underlying the structure. The structure of the innovation process should reflect the values that form part of the organisational culture. The subsidiaries that implemented the most innovations in this study had an open, rather free-flowing approach to innovation in place.

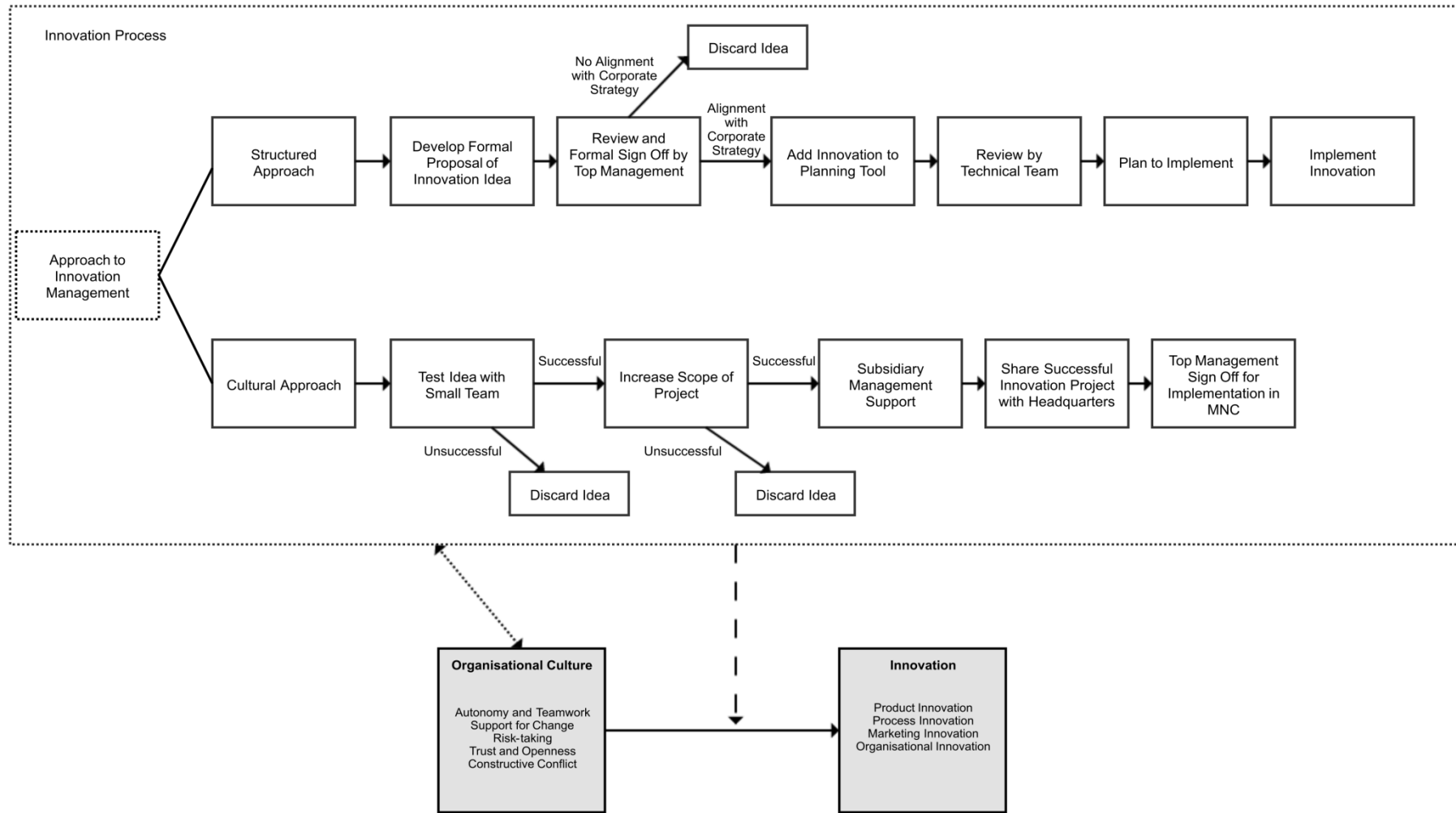


Figure 7.2: Model of Innovation-Supportive Culture – Innovation Process

As a subsidiary forms part of the overall MNC network, headquarters presents an influence on the innovation dynamics in the subsidiary that were outlined in the preceding section. These influences are captured in Figure 7.3. Headquarters resistance emerged as a result of the quantitative phase of the research and is therefore represented by broken outlines and a broken arrow line represents its effects. The two other factors, the formulation of the global innovation strategy and the final sign-off on innovation, were added following the qualitative phase. These factors are shown in dotted outlines and their influences are represented by dotted arrow lines.

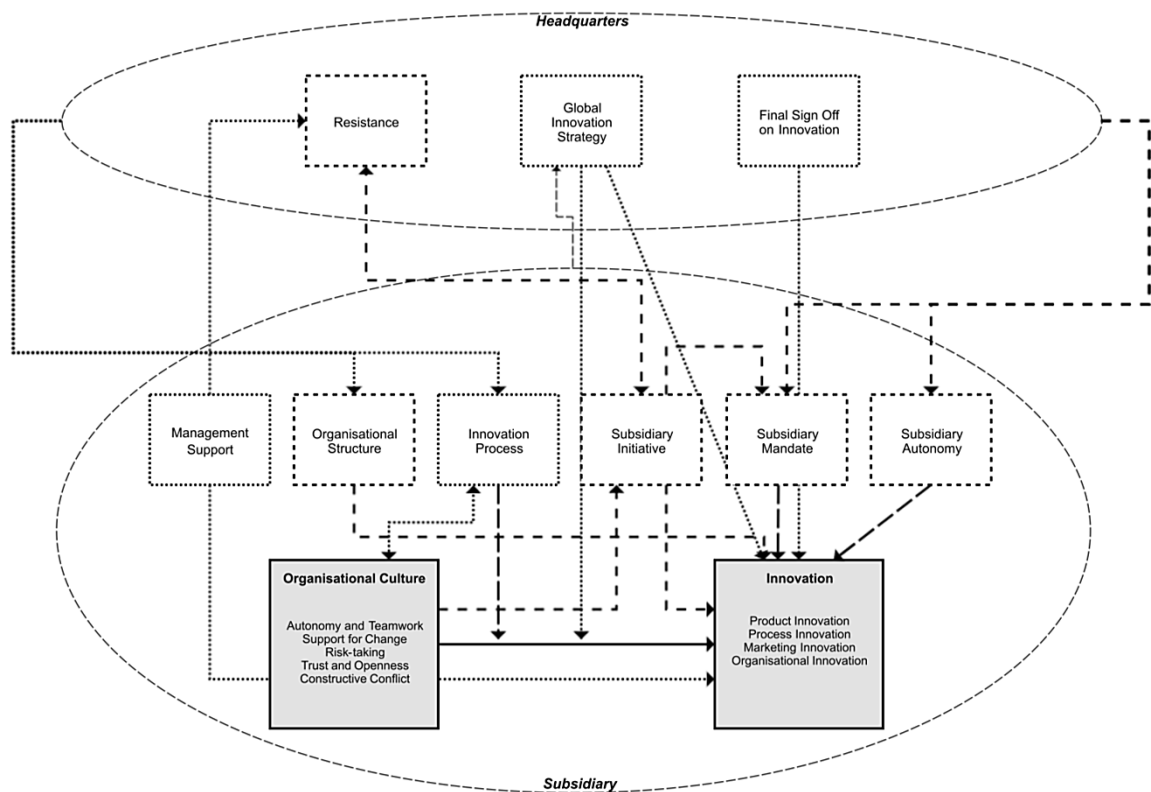


Figure 7.3: Model of Innovation-Supportive Culture – Headquarters and Subsidiary

Whereas subsidiaries generally seem to be autonomy-seeking, headquarters tend to prefer central control, which has a direct influence on the level of autonomy a subsidiary experiences (Bartlett & Ghoshal, 1986; Paterson & Brock, 2002). This preference for control is reflected in the study's findings that most of the forms of innovations under study were tightly controlled by headquarters and subsidiaries, therefore, experienced a low level of autonomy to engage in innovation. Only the subsidiary that held a dedicated mandate for innovation reported a high level of autonomy. In this study, the subsidiaries' mandates were assigned by headquarters, presenting another headquarters' influence on the level of innovation taking place at the subsidiary. As the organisational structure and the

innovation process in a multinational subsidiary are generally aligned with the global corporate structure and innovation process, headquarters also presents an influence on these factors in the subsidiary. Whereas all of the subsidiaries reported a flat organisational structure, their innovation processes were either highly structured or loosely structured and culturally-based, depending on the MNC's overall approach to structuring its innovation process. Subsidiary initiative can result in resistance at headquarters as a way of protecting against behaviour that is not in line with corporate objectives (Birkinshaw & Hood, 1998). By increasing the level of monitoring and control as a result of this resistance, headquarters can, in turn, affect the extent to which subsidiaries engage in subsidiary initiatives (Ambos et al., 2010). Subsidiary managers can mitigate the level of headquarters resistance by actively supporting the subsidiary innovation activities at meetings with headquarters. The global innovation strategy is generally formulated at headquarters. This directly affects the level of subsidiary innovation as innovation tasks are assigned to subsidiaries based on the global strategy. Some subsidiaries have input into this process by either presenting their own subsidiary innovation strategy or by proposing to take on innovation activities in their area of expertise. The global innovation strategy also influences the impact of organisational culture on innovation as it may be perceived as somewhat of an obstacle to subsidiary innovation by providing a defined boundary for innovation at the subsidiary level. Ideas that are outside of these boundaries are less likely to be considered and may, in turn, be less likely put forward. As a result of this, the subsidiary may be left with little scope to innovate and move on opportunities that it has identified. The formal power of the final sign-off on innovation rests firmly with headquarters. This has a direct and substantial impact on the level of innovation at the subsidiary as the decision as to whether an innovation will go ahead or not rests solely with headquarters.

Having considered the influences internal to the subsidiary and the headquarters subsidiary relationship, the influences of the host country environment will be presented next. This component was added to the model following the qualitative phase of this study. Figure 7.4 shows that a subsidiary rests within the host country environment and a number of linkages with the host country environment have an effect on the level of subsidiary innovation. Subsidiaries generally engaged in collaboration with institutions in the local environment. These ranged from national research centres and universities to local startups. The collaborations were undertaken to build onto the subsidiaries' knowledge and capabilities, often with a view to ultimately extending the subsidiary mandate.

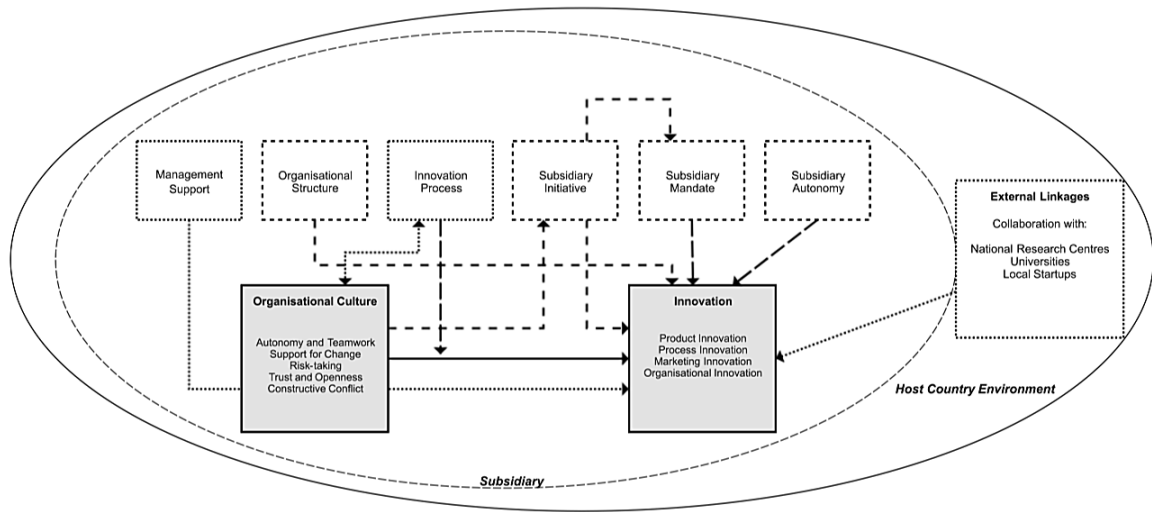


Figure 7.4: Model of Innovation-Supportive Culture – Subsidiary and Host Country Environment

The factors laid out in stages in the preceding sections were combined into a full model of innovation-supportive culture in subsidiaries (Figure 7.5). This model is a first attempt at understanding the internal and external factors that supported or impeded the innovation-supportive culture in multinational subsidiaries in the Irish ICT sector. This study was limited to a specific sector and included a limited number of organisational culture dimensions. More research is required to test and extend these findings to develop a reliable model of innovation-supportive culture in multinational subsidiaries.

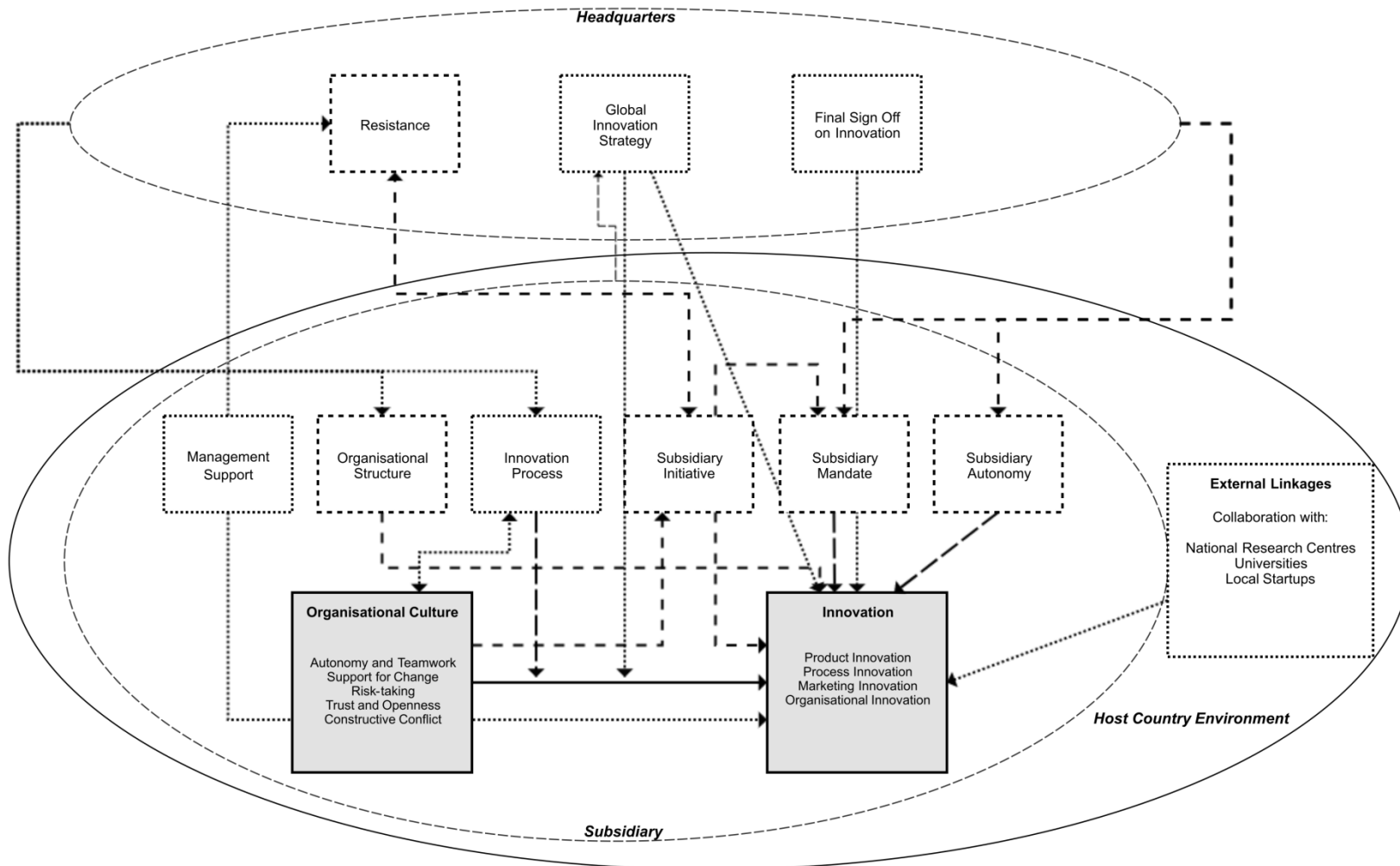


Figure 7.5: Model of Innovation-Supportive Culture in Subsidiaries

7.6 Implications of Key Findings

This study has provided insight into the effects of organisational culture on innovation in multinational subsidiaries in the Irish ICT sector. The major contribution of this study stems from the fact that there is a paucity of research that explores innovation-supportive culture in the subsidiary context. This study has explored the effects of five dimensions of organisational culture on four different forms of innovation and demonstrated how insights into the complexities of this relationship could help with understanding the innovation process in MNCs from a subsidiary perspective. The use of an explanatory sequential mixed methods design for this study, which combined quantitative and qualitative approaches to data collection and analysis, allowed for a more complete understanding of the research problem and added value to the study results and their interpretations.

Recognising the importance of multinational subsidiaries to the Irish economy overall (GVA² contributions from Foreign-owned enterprises to non-financial business economy in 2014 were at 52.1% of total GVA, in comparison to an EU average of 23.9% in 2013 (Central Statistics Office, 2014), the results of this study are aimed at numerous stakeholders: subsidiary managers, managers at multinational HQs, as well as policymakers and inward investment promotion agencies. Knowing the potential predictive power of selected organisational culture dimensions on innovation at the subsidiary level as well as factors that may have an impact on these effects may assist in the development of strategies to enhance subsidiary innovation.

The findings of this study have a number of practical implications:

Firstly, the organisational culture dimensions of support for change, risk-taking, and trust and openness have a significant effect on the total number of innovations implemented at the subsidiary level. This finding helps subsidiary managers understand which dimensions of an innovation-supportive culture are especially important and provide them with an area of focus with regard to further supporting innovation.

² Gross value added is the value of output less the value of intermediate consumption; it is a measure of the contribution to GDP made by an individual producer, industry or sector (OECD, 2001).

Secondly, the effects of the five dimensions of organisational culture differ for the four forms of innovation under study. For subsidiary managers to adequately support innovation, they need to be aware of these differences. This allows them to make changes to their cultural approach if the subsidiary's focus rests on one of these forms of innovation.

Thirdly, the subsidiary headquarters context is a pertinent factor in the relationship between organisational culture and innovation at the subsidiary level. Some of the expected relationships between the five dimensions of organisational culture and innovation did not hold in this context. For example, both support for change and autonomy and teamwork were expected to have a positive effect on innovation. However, the findings showed that both negatively affected the number of innovations implemented which is thought to be due to the subsidiary headquarters context. These findings may help subsidiary managers understand the significance that the subsidiary headquarters context has for innovation at the subsidiary level. In an instance where an innovation-supportive culture might not have the desired effect on innovation, an awareness of the contextual factors may be valuable in explaining why this is the case. This awareness would also provide a valuable starting point for subsidiary managers to explore and evaluate how they can influence the overall innovation process at the subsidiary.

Fourthly, these findings may also aid headquarters management in understanding how existing MNC processes affect innovation at the subsidiary level. This may be especially important if headquarters plans to utilise the subsidiary's knowledge of the local environment and integrate it into its overall innovation plans. In this case, local responsiveness could be increased by showing a higher receptivity towards subsidiary initiatives and providing the subsidiary with a higher level of autonomy.

Fifthly, this study found that most subsidiaries engage in knowledge exchanges in the host country environment, such as collaborations with universities and national research centres. This highlights the importance of external linkages as well as the positive effects these can have on innovation at the subsidiary level. Subsidiary managers should see this as a way of furthering their subsidiary's unique knowledge and capabilities which may become invaluable in the MNC context. In order for the MNC to remain competitive in the global economy, headquarters managers may benefit from a strong awareness of differences between specialised knowledge pools in different countries. The potential value of these knowledge pools to the MNC could then be tapped through subsidiaries' engagement in knowledge exchanges.

Finally, the dynamics explored in this study may also be important for policymakers and inward investment promotion agencies to understand the challenges that subsidiaries may currently face with regard to innovation in the host country. It also provides a valuable starting point for exploring how they can support subsidiaries in developing their mandate and engaging in more high-value activities.

7.7 Conclusion

This chapter has presented the integration of the findings from the quantitative and qualitative phase of this study. The integrated findings on innovation-supportive culture and contextual factors have then been discussed and related to prior research. Next, the preliminary model of innovation-supportive culture in subsidiaries has been described. Finally, the implications of the findings have been presented. The next chapter presents and discusses the main findings of this study as well as the contributions of this study, followed by the limitations of the research and recommendations for further research.

8 CONCLUSION

8.1 Introduction

Subsidiaries provide a particularly interesting context for studying innovation. Up until recently, it was assumed that subsidiaries grow in their role as contributors to the innovation process of the MNC. However, more recent contributions to the literature have argued that MNCs are undergoing a dramatic shift from horizontally integrated structures to more vertically controlled, cost-focused structures (Buckley, 2009; Reilly & Sharkey Scott, 2014). As MNCs now have the option to allocate strands of activities from across the value chain to subsidiaries, a subsidiary in a particular location may no longer be a national subsidiary but an amalgamation of a number of different value chain activities. Most MNCs have now moved towards some variant of this global business unit structure (Birkinshaw & Pedersen, 2009). This slicing of value-adding activities, assigned to the subsidiary, closely monitored and with little autonomy, substantially reduces the subsidiary's ability to adopt a strategic perspective and to identify how its operation fits within the organisation (Scott & Gibbons, 2011). This, in turn, reduces the potential for subsidiary initiative as the subsidiary's role is limited to achieving its value-adding activities efficiently and effectively. In a situation where subsidiary initiatives are not actively promoted, one could assume that the full potential of subsidiaries is not utilised (Raziq et al., 2014).

As an innovation-supportive culture is seen to support subsidiary initiative and ultimately innovation at subsidiary level (Birkinshaw et al., 1998), a question is raised as to how this relationship is affected by the recent developments discussed above. This study contributes to the understanding of innovation-supportive culture in multinational subsidiaries as well

as to contextual factors in the case of the Irish ICT sector. ICT companies, especially, often refer to their organisational culture as a main driver of innovation (Jana, 2013; Leong, 2013).

This concluding chapter presents a synopsis of the study design and the two phases of this research. For each of the two phases, the data collection and data analysis methods, as well as the results, are briefly described. Subsequently, the preliminary model of innovation-supportive culture is presented. The contributions of this study are then considered, followed by a discussion of the limitations of the research along with directions for future research.

8.2 Study Design

This mixed methods sequential explanatory study was undertaken to identify factors supporting and/or impeding innovation in multinational subsidiaries in the Irish ICT sector.

In the first, quantitative phase of the study, the quantitative research question focused on how five selected organisational culture dimensions served as predictors of innovation in multinational subsidiaries. Three hypotheses and their respective sub-hypotheses were tested. In the second, qualitative phase, four interviews, selected based on the results from the first phase (two from the low total innovation category, one from the medium total innovation category and one from the high total innovation category) were undertaken to explore in-depth the results from the statistical tests.

The quantitative and qualitative methods were connected during the intermediate phase of the research process; selecting the participants for the interviews and developing the interview guide for the qualitative data collection were based on the results of the statistical tests undertaken in the first, quantitative phase. The findings of the two phases were further integrated in the discussion of the study outcomes.

8.3 Quantitative Phase

In the first, quantitative phase, data was collected by means of a self-administered web-based survey. The survey instrument was developed based on a number of pre-existing instruments in the literature. Univariate and multivariate analyses were undertaken to analyse the survey data. The organisational culture dimensions support for change, risk-taking, and trust and openness had a significant impact on the total number of innovations.

Support for change and trust and openness also had a significant predictive power on the number of product innovations implemented. Only one of the five organisational culture dimensions, risk-taking, had a positive impact on the number of process innovations implemented. For marketing innovation, only the control variable, subsidiary age, had significant predictive power. For organisational innovation, none of the five organisational culture dimensions had a significant predictive power.

8.4 Qualitative Phase

In the second, qualitative phase, the data was collected by means of in-depth semi-structured interviews with four participants. Additional documentary information was brought together from company records and from newspapers and reports from government bodies. Qualitative data for the study consisted of transcribed interviews which were analysed using MAXQDA software with a thematic analysis approach. The five dimensions of organisational culture were largely supported by the perceptions of an innovation-supportive culture exhibited in the interviews. Three factors affected the relationship between organisational culture and innovation, as reflected by the themes that emerged from the qualitative analysis: 1) innovation-supportive organisational systems and processes, 2) other organisational determinants, and 3) the headquarters subsidiary relationship. The innovation-supportive organisational systems and processes and the headquarters subsidiary relationship were the most discussed themes. Interview participants were less inclined to talk about the other organisational determinants, such as a flat organisational structure, that may affect how organisational culture influences innovation.

8.5 Model of Innovation-Supportive Organisational Culture in Multinational Subsidiaries

Based on the findings from the quantitative and qualitative phases of this study, the preliminary model of innovation-supportive organisational culture in multinational subsidiaries was refined and expanded, which included the addition of factors both internal and external to the subsidiary. The five dimensions of organisational culture, autonomy and teamwork, risk-taking, support for change, trust and openness, and constructive conflict, differentially affected innovation in the subsidiary. The relationship between organisational culture and innovation in subsidiaries, as well as the level of subsidiary innovation, is influenced by organisational systems and processes designed to support innovation, other organisational determinants, such as the organisational structure and

management support, and the headquarters subsidiary relationship. Factors internal to the subsidiary, such as management support, organisational structure, nature of the innovation process, level of subsidiary initiative, subsidiary mandate, and subsidiary autonomy represent influences on the relationship between organisational culture and innovation in the subsidiary as well as on the level of subsidiary innovation. The headquarters subsidiary relationship also affects subsidiary innovation as headquarters' resistance and the resulting increase in monitoring might leave the subsidiary with little scope for innovation. The MNC's preference to retain control over central elements of its innovation process, such as the formulation of the global innovation strategy and the final sign-off on innovation, at headquarters level presents another influence on subsidiary innovation. The subsidiary's external linkages with the host country environment, through collaboration with national research centres, universities, or local startups, further have an effect on the level of innovation in the subsidiary.

Overall, the model shows the complexities of innovation in subsidiaries by detailing the factors that influence the relationship between organisational culture and innovation in subsidiaries. Taken together, the findings indicate that innovation at the subsidiary level is influenced by the culture in the subsidiary as well as headquarters and the host country environment.

8.6 Research Contribution

8.6.1 Theoretical and Methodological Contributions

The main significance of this study exists in its contribution to the underdeveloped area of innovation-supportive culture in multinational subsidiaries. While it is recognised that organisational culture has an impact on the level of innovation in an organisation and can either support or hinder the implementation of innovations (Ahmed, 1998; Jassawalla & Sashittal, 2002), little is known about this association in the context of the multinational subsidiary. Knowledge and understanding of the organisational culture dimensions that affect innovation at the subsidiary level may provide additional insight into the construct of innovation-supportive culture as well as into the unique subsidiary-related factors that may affect this relationship.

The findings from this study make several contributions to the current literature. First, from an international business perspective, this study answers the call for further research on entrepreneurship in the multinational subsidiary (Birkinshaw, 1997; Birkinshaw et al.,

2005), with a specific focus on the innovation-supportive culture in subsidiaries. This study has shown that the organisational culture in a subsidiary represents an important influence on the level of innovation undertaken in the subsidiary and has identified key contextual elements of this relationship. This study extends the concept of an innovation-supportive culture to the level of the subsidiary.

Second, the multidimensional approach adopted in this study presents an important contribution to the largely uni-dimensional domain of innovativeness research. Innovativeness research to date has largely been of an uni-dimensional nature, focusing either on a specific dimension of organisational culture and its impact on innovation (De Dreu, 2006; Dewett, 2004; Hoegl & Gemuenden, 2001; Kivimäki et al., 2000) or on a distinct form or magnitude of innovation (Cooper et al., 2004; Khazanchi et al., 2007; Tellis et al., 2009). This uni-dimensionality has been one of the major criticisms of innovation studies (Dobni, 2008; Read, 2000). By employing a multidimensional approach that determined the effect of five selected dimensions of organisational culture on four different forms of innovation, this thesis has taken a much finer-grained approach to investigating the relationship between organisational culture and innovation. This approach has shown that multiple dimensions of organisational culture simultaneously affect innovation and that the influence of organisational culture depends on the form of innovation under study. By doing so, this research has shown the need for future research to consider multiple dimensions of organisational culture and/or multiple forms of innovation.

Having recognised the absence of a theoretical framework of innovation-supportive culture in subsidiaries, the thesis has provided such a model following the integration of the quantitative results and qualitative findings and a broad discussion of the integrated findings. The model includes factors internal and external to the subsidiary that affect the relationship between organisational culture and innovation in the subsidiary. The development of this model represents the main theoretical contribution of the study and highlights the importance of an innovation-supportive culture in subsidiaries whilst also pointing towards the complexities involved.

Additionally, this study yielded valuable results due to the mixed methods research design. By combining both quantitative and qualitative approaches (Creswell, 2009; Teddlie & Tashakkori, 2009), this study offers some important insights into the construct of innovation-supportive culture in multinational subsidiaries. Firstly, the predictive power of selected organisational culture dimensions contributing to and/or impeding innovation at

the subsidiary level was identified. Secondly, participants' views of innovation-supportive organisational culture dimensions as well as influences on the relationship between organisational culture and innovation especially in multinational subsidiaries were explored. The set of factors that was obtained by using qualitative and quantitative methods was more comprehensive and reached a deeper level of culture than what would have been achieved through a quantitative assessment alone. The mixed methods approach is therefore considered an appropriate tool to identify and uncover the diverse interrelations and dynamics of innovation-supportive culture at the subsidiary level.

Methodologically, this study has made a contribution to mixed methods research by detailing procedural issues of a sequential explanatory design, such as connecting the quantitative and qualitative data within a study and integrating the results of the two sequential phases of the study.

8.6.2 Empirical Contributions

This research has provided empirical support for the understudied research area of innovation-supportive culture in subsidiaries. Other empirical studies focus on innovation-supportive culture in individual organisations (Chandler et al., 2000; Jassawalla & Sashittal, 2002; Khazanchi et al., 2007), whereas this one extends the concept of innovation-supportive culture to the level of the subsidiary.

To the researcher's best knowledge, this is the first study to investigate the effects of organisational culture on innovation in Irish ICT subsidiaries. This research, therefore, has contributed to knowledge of innovation-supportive culture in subsidiaries in the Irish ICT sector and provided data by conducting a quantitative survey followed by in-depth semi-structured interviews. This research has also provided data on the internet subsector which has been somewhat understudied due to a lack of a strict definition of what constitutes the sector (Ofek & Richardson, 2003).

8.6.3 Contributions to Policy and Practice

In its report 'Innovation 2020: Ireland's Strategy for Research and Development, Science, and Technology', the Irish government acknowledges the importance of innovation "in driving productivity growth and fostering competitiveness in a global world where knowledge and innovation are critical factors for the advanced economies" (Interdepartmental Committee on Science, Technology and Innovation, 2015). The ICT sector remains a priority area for Ireland in which to support innovation. This study has

shown that an innovation-supportive culture has a significant impact on innovation in subsidiaries in the ICT sector. While the government report outlines a number of strategies to support innovation in organisations as well as subsidiaries in Ireland, it fails to consider the impact of an innovation-supportive culture. It is surprising that the report makes reference to an innovation culture at the national level but neglects to do so at the organisational level. A key policy priority should, therefore, be to incorporate organisational culture as a key consideration with regard to supporting innovation.

Further, this research has several practical applications. Firstly, it points to the importance of an innovation-supportive culture in subsidiaries in the Irish ICT sector. An understanding of this concept is significant to subsidiary managers contemplating how to support innovation. Secondly, knowing the predictive power of selected dimensions of organisational culture to innovation as well as understanding the contextual factors involved may assist subsidiary managers in developing processes to enhance innovation. Thirdly, having an understanding of the fact that the effects of the five dimensions of organisational culture differ for the four forms of innovation may assist subsidiary managers with supporting specific forms of innovation. Fourthly, subsidiary managers can utilise the questionnaire employed in this study to measure the existing innovation culture in the organisation. Fifthly, the construct can be used for evaluation purposes. An organisation's initial level of innovation culture could be measured and its efforts to improve its culture could then be tracked. Finally, the multidimensional construct could be used diagnostically. For example, if an organisation scores poorly on the risk-taking dimension, further investigation may uncover specific areas for improvement. Or if a business unit or team scores well on a defined dimension, efforts could be mapped, replicated, and introduced to other business units or teams in the organisation.

Table 8.1 summarises the main findings of this study as well as their implications for subsidiary management, MNC management, and the local government.

Table 8.1: Key Findings

Key Finding	Action by Government	Action by MNC Management	Action by Subsidiary Management
<p>The organisational culture dimensions of support for change, risk-taking & trust and openness have a significant effect on the total number of innovations implemented at the subsidiary level</p>			<p>Develop an understanding of the concept of innovation-supportive culture and how it impacts innovation</p> <p>Gain understanding of which dimensions of an innovation-supportive culture are especially important</p> <p>Establish focal areas with regard to supporting innovation in the subsidiary</p>
<p>The effects of the five dimensions of organisational culture differ for product, process, organisational, and marketing innovation at the subsidiary level</p>			<p>Develop an awareness of the differences in impact of organisational culture on the different forms of innovation</p> <p>Design processes to adequately support specific forms of innovation in the subsidiary</p> <p>Implement changes to existing processes to better support specific forms of innovation</p>
<p>A cultural approach to innovation management was found to have a favourable impact, whereas a more formal innovation process seems to have had a detrimental impact on the level of subsidiary innovation</p>		<p>Review existing innovation process to ensure it is aligned with strategic innovation goals</p> <p>Establish balance between control and autonomy of subsidiaries to provide subsidiaries with scope to innovate</p>	<p>Build an awareness of how innovation is affected by headquarters control and level of subsidiary autonomy</p> <p>Engage in local innovation activities to pilot ideas with the aim of extending the subsidiary mandate and gaining recognition for innovative ability</p>

The MNC context has an impact on the relationship between organisational culture and innovation at subsidiary level	<p>Develop an understanding of the challenges that subsidiaries face in relation to innovation in the host country</p> <p>Include an innovation-supportive culture at the organisational level as a key policy consideration with regard to supporting innovation</p>	<p>Develop an awareness of the impact of the MNC context on innovation at the subsidiary level</p> <p>To support innovation in subsidiaries, increase the receptivity towards subsidiary initiatives and provide subsidiaries with a higher level of autonomy</p>	<p>Develop an understanding of the significance that the MNC context has for innovation at the subsidiary level</p> <p>Explore and evaluate how overall innovation processes at the subsidiary can be influenced</p>
Most subsidiaries engage in knowledge exchanges in the host country environment	Explore how subsidiaries can be supported in developing their mandate in order to engage in more high-value activities	<p>Build a strong awareness of differences between specialised knowledge pools in different countries of operation</p> <p>Devise a strategy on how to tap these knowledge pools through subsidiary engagement in knowledge exchanges</p>	Utilise linkages with the local environment to further the subsidiary's unique knowledge and capabilities

8.7 Limitations of the Research

The main aim of this study was to explore the concept of innovation-supportive culture in multinational subsidiaries. Subsidiaries that were part of the ICT sector in Ireland were chosen. The generalisability of the results from this study is therefore subject to certain limitations. For instance, the findings may not be generalisable across other sectors or countries. The focus on MNC subsidiaries has been selected for two reasons. Firstly, foreign-owned companies are important to the Irish economy overall. While the vast majority (98%) of enterprises in Ireland are Irish-owned, foreign-owned companies account for 55.9% of total turnover (Department of Finance, 2014). The software and communications sector is one sector that is dominated by MNC subsidiaries. Multinational activity in this sector accounted for 10.2% of total economy-wide gross value added (Department of Finance, 2014). The ICT sector in Ireland lends itself especially well to a study on innovation as it took the leading position in the EU in 2009 with a 6.4% share of total value added to GDP ratio (Stancik & Desruelle, 2012). Moreover, the ICT sector presents a unique combination of R&D based innovation as well as organisational innovation (Wintjes & Dunnewijk, 2008). The number of ICT businesses located in Ireland also makes the ICT sector a very practical choice. Ireland has one of the highest concentrations of ICT activity and employment in the OECD and is one of the premier global locations for technology companies (ICT Ireland & ISA, 2013). It is thought that a focus on a single host country helps control for variations in institutional settings, such as external linkages with other firms, universities, and research centres which are likely to have an impact on the level of innovation in subsidiaries (Frost, 2001).

Additionally, this study was limited by the moderate response rate with regard to the survey. Only subsidiaries that returned three questionnaires were included in the analyses. In all, 62 subsidiaries were approached and a total of 9 subsidiaries provided sufficient data for inclusion. This resulted in a response rate of 14.52%. This response rate is slightly lower than that observed in an innovation study that included a survey with the same minimum number of multiple responses (17%) (see Baer & Frese, 2003). While Baer and Frese's study utilised a postal survey, this study used a web survey which typically results in lower response rates. The response rate is in line with the general response rate for detailed online surveys of around 10-25% (see Sauermann & Roach, 2013). Nonresponse bias was investigated by conducting a comparison of early and late respondents.

Conducting a number of in-depth field interviews in the qualitative phase of this study also tested survey responses.

An additional factor limits the generalisability of the findings. Although all subsidiaries that met the inclusion criteria for the study were invited to participate, not all wished to do so. This may have resulted in a potential self-selection bias. Whether the subsidiaries that participated in the study were significantly different from those that decided not to participate cannot be known.

One source of weakness in this study which could have affected the measurement of the organisational culture variables was a potential misunderstanding of the question context. This may have resulted in the survey data reflecting interactions between the MNC and the subsidiary instead of just interactions within the subsidiary. Amending the lead-in to the questions to “In this subsidiary...” might help alleviate this concern.

The cross-sectional nature of the survey design and the statistical analyses undertaken presents a further limitation of this study. While the design of the study facilitated the identification of relationships between different variables it did not demonstrate causality. The use of a mixed methods approach may have gone some way to alleviate the concerns around cross-sectional research by expanding and explaining the results from the statistical analysis.

8.8 Directions for Future Research

This study adds to a growing body of research on entrepreneurial subsidiaries (see Boojihawon et al., 2007; Dimitratos et al., 2009) and points to some interesting insights into the relationship between organisational culture and innovation at the subsidiary level. A future study conducted at both corporate and subsidiary level could help ascertain whether differences exist between the innovation-supportive culture at headquarters and at the subsidiary level. The results of this line of research might provide additional evidence to suggest whether structural or power considerations in the MNC have a dampening effect on the organisational culture.

The scope of this study was limited to IDA client companies. Further research should be carried out to establish whether the effects found in this population would differ substantially from the wider MNC subsidiary population in Ireland.

This study has been undertaken in the Irish context. Different national settings may be host to different types of subsidiaries. Depending on the strategic importance of the host

country, subsidiaries may take on a different role in the MNC network. Recent discussions around Ireland's corporate tax rate have also put into question the rationale behind choosing Ireland as a subsidiary location for large US MNCs in particular. The question has been raised whether Ireland is chosen based on its strategic importance as a doorway to Europe or whether tax considerations play a leading role. The rationale behind this decision may also impact the level of innovation taking place in the subsidiary. Further research might, therefore, explore whether the findings of this study hold true in other institutional and national settings.

Future research replicating this study across numerous sectors, instead of limiting it to the ICT sector, would be useful. This would allow establishing potential differences between sectors.

This study's findings demonstrate that carrying out further empirical work in relation to innovation-supportive culture in subsidiaries can help advance our understanding of this phenomenon as well as the contextual factors that affect it. This research also contributes to calls for more empirical work in this area (Birkinshaw, 1997; Birkinshaw et al., 2005).

The present study has shown the richness of data that can be gathered using a mixed-methods approach and as such could potentially serve as an example as to the advantages of adopting a mixed methods approach for innovation research (as advocated by Anderson, De Dreu, & Nijstad, 2004) as well as organisational culture research (as recommended by Yauch & Steudel, 2003). This study could therefore potentially form a basis for further research in these areas.

8.9 Conclusion

This study has explored the effects of organisational culture on innovation in multinational subsidiaries in the Irish ICT sector and demonstrated how insights into the complexities of this relationship help with understanding the innovation process in MNCs from a subsidiary perspective. The major contribution of this research lies in its utilisation of a multidimensional construct of innovation-supportive culture to explore multiple forms of innovation in the subsidiary context. It illustrates the highly contextual nature of both organisational culture and innovation and how these two constructs are influenced by the dynamics of the headquarters subsidiary context.

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10 APPENDICES

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APPENDIX A SURVEY INSTRUMENT



TRINITY COLLEGE DUBLIN
COLÁISTE NA TRÍONÓIDE, BAILE ÁTHA CLIATH

THE
UNIVERSITY
OF DUBLIN

Introduction

Welcome to the Innovation and Organisational Culture Survey!

This survey is being conducted to understand the impact of organisational culture upon innovation within ICT firms in Ireland. This is an area which has not been fully researched within the Irish context and is of practical relevance to the management of ICT firms. Your participation in the study will contribute to a better understanding of the impact of different dimensions of organisational culture on innovation and thus benefit the management of the innovation process.

The survey consists of two parts with separate questions on innovation and organisational culture. Part 1 on innovation is aimed at a single respondent in a senior management role with knowledge of innovation activities. Part 2 on organisational culture is aimed at a representative cross-section of employees at all levels of the organisation.

Please take the time (approximately 10 minutes) to complete the survey; completing the survey will document your consent to participate. You may withdraw from participation at any time and omit individual responses without penalty. This survey is strictly confidential. All data collected from the questionnaire will be reported only in the aggregate. Under no circumstances will your individual responses be made available to anyone in your organisation or any other organisation.

If you have any questions, please email me at wolffr@tcd.ie. I would like to thank you in advance for your time and effort.

Sincerely,

Frauke Wolf

PhD Researcher
School of Business
Trinity College Dublin
wolffr@tcd.ie

Q1. Please tick the box below to the left.

- I have read the introductory description of this research and ways in which the data will be used and I consent to my survey answers being used in this survey.

Q2.

What is your position within the organisation?

- Senior Management Role - with knowledge of innovation activities

- Other Senior Management Role
- Middle Management Role
- Lower Management Role

Organisational Culture

3. The following sections deal with the organisational culture displayed in your organisation as a whole. Please rank the statements according to your agreement with them.

Flat Hierarchy

Q4. In our organisation...

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Teamwork is used to get work done, rather than hierarchy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our decision making process can best be described as consensus building.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teams are our primary building blocks.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a great deal of tolerance of individual working styles.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
We have the freedom to decide how we are going to carry out our projects.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We actively encourage cooperation across different parts of the organisation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Business planning is ongoing and involves everyone in the process to some degree.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People work like they are part of a team.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Support for Change

Q5. In our organisation...

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
New ideas are encouraged.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

We are willing to experiment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The way things are done is very flexible and easy to change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New and improved ways to do work are continually adopted.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Attempts to create change usually meet with resistance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Everyone believes that he or she can have a positive impact.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We are quick to take advantage of opportunities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We often search for new opportunities in the external environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Risk-taking

Q6.
In our organisation...

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Innovation and risk-taking are encouraged and rewarded.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Uncertainty is viewed as opportunity, not as risk.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Failure is acceptable, if the effort on the project was good.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
We have a good mechanism for encouraging and developing creative ideas.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We view failure as an opportunity for learning and improvement.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Innovation is a core value.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Trust and Openness

Q7.
In our organisation...

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
There is a high degree of organisational trust.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We freely share information around the organisation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Differing views are encouraged.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information is widely shared so that everyone can get the information he or she needs when it's needed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our compensation formula is well aligned with our organisation's goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Constructive Conflict

Q8. In our organisation...

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
It is easy to reach consensus, even on difficult issues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When disagreements occur, we work hard to achieve win-win situations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We are encouraged to challenge decisions and actions if we think there is a better way.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We challenge each other's ideas in a constructive way.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Everyone takes responsibility for his/her own actions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We directly confront problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Demographics

Q9. Which industry best describes your organisation?

- ICT – Internet
- ICT – Software
- ICT – Hardware
- Other, please specify...

Q10.

How long have you been with the organisation?

- 0 - 1 years
- 2 - 5 years
- 6 - 9 years
- 10 or more years

Q11.

What is your age?

- 25 - 35
- 36 - 45
- 46 - 55
- 56 or over

Organisation

. All of the following questions focus on your organisation's innovation activities undertaken in Ireland.

Q2a.

In the last three years 2011-2013, has your organisation undertaken any innovation activities?

- Yes
- No

Q2b.

How many years has the organisation been trading at all the locations in Ireland?

- Less than 1 year
- 1 year
- 2 years
- 3 years
- 4 years
- 5 years
- 6 - 10 years
- 11 - 20 years
-

more than 20 years

Q2c.

What is the approximate total number of employees your organisation has at all the locations in Ireland?

- 1 - 9
- 10 - 49
- 50 - 99
- 100 - 249
- 250 - 499
- 500 - 999
- 1,000 - 4,999
- 5,000 and above

Product Innovation

A **product innovation** is the introduction of a good or service that is **new** or **significantly improved** with respect to its characteristics or intended uses. This includes significant improvements in technical -specifications, components and materials, incorporated software, user friendliness or other functional characteristics.

- Product innovations need to be new to your organisation but do not need to be new to the market.
- Product innovations could have been originally developed by your organisation or by another organisation.

Q2d.

During the three years 2011 to 2013, did your organisation introduce...

If you haven't had any product innovations, please answer no below and skip to Question 2i.

	Yes	No
New or significantly improved goods?	<input type="radio"/>	<input type="radio"/>
New or significantly improved services?	<input type="radio"/>	<input type="radio"/>

Q2e.

Who developed these product innovations? *Check the most appropriate response.*

- Mainly your organisation
- Mainly your organisation together with other organisations or institutions
- Mainly other organisations or institutions

Q2f.

During the three years 2011 to 2013, were any of your organisation's good or service innovations...

	Yes	No
New to a market? Your organisation introduced a new or significantly improved good or service to one of your markets before your competitors. (It may have already been available in other markets.)	<input type="radio"/>	<input type="radio"/>
Only new to your organisation? Your organisation introduced a new or significantly improved good or service that was already available from your competitors in your market.	<input type="radio"/>	<input type="radio"/>

Q2g.

In 2013, approximately how many ideas for new or significantly improved goods or services did your organisation generate?

	Number of Ideas
Number of ideas for new or significantly improved goods	<input type="text"/>
Number of ideas for new or significantly improved services	<input type="text"/>

Q2h.

In 2013, approximately how many new or significantly improved goods or services did your organisation introduce into the market?

	Number of Innovations
Number of new or significantly improved goods	<input type="text"/>
Number of new or significantly improved services	<input type="text"/>

Process Innovation

A **process innovation** is the implementation of a **new or significantly improved** production or delivery method. This includes significant changes in techniques, equipment and/or software.

- Process innovations need to be new to your organisation but do not need to be new to the market.
- Process innovations could have been originally developed by your organisation or by another organisation.
- Exclude purely organisational innovations.

Q2i.

During the three years 2011 to 2013, did your organisation introduce...

If you haven't had any process innovations, please answer no below and skip to Question 2m.

	Yes	No
New or significantly improved methods of producing goods or services?	<input type="radio"/>	<input type="radio"/>
New or significantly improved logistics, delivery and distribution methods for your inputs, goods or services?	<input type="radio"/>	<input type="radio"/>
New or significantly improved techniques, equipment and software in support activities, such as purchasing, accounting, computing and maintenance?	<input type="radio"/>	<input type="radio"/>

Q2j.

Who developed these process innovations? *Check the most appropriate response.*

- Mainly your organisation
- Mainly your organisation together with other organisations or institutions
- Mainly other organisations or institutions

Q2k.

In 2013, approximately how many ideas for new or significantly improved processes did your organisation generate?

	Number of Ideas
Number of ideas for new or significantly improved processes	<input type="text"/>

Q2l.

In 2013, approximately how many new or significantly improved processes did your organisation introduce?

	Number of Innovations
Number of new or significantly improved processes	<input type="text"/>

Marketing Innovation

A **marketing innovation** is the implementation of a new marketing method not previously used by the organisation. It must be part of a new marketing concept or strategy that represents a significant departure from the organisation's existing marketing methods.

- It requires significant changes in product design or packaging, product placement, product promotion or pricing.
- Exclude seasonal, regular and other routine changes in marketing instruments.

Q2m.

During the three years 2011 to 2013, did your organisation introduce...

If you haven't had any marketing innovations, please answer no below and skip to Question 2q.

|

	Yes	No
Significant changes to product design and packaging? (exclude changes that alter the product's functional or user characteristics as those are product innovations)	<input type="radio"/>	<input type="radio"/>
New methods for goods or service placement or sales channels? (e.g. introduction for the first time of a franchising system, of direct selling or exclusive retailing, and of product licensing, etc.)	<input type="radio"/>	<input type="radio"/>
New media or techniques for goods or service promotion? (e.g. product placement in movies or television programmes, use of celebrity endorsements, new branding, etc.)	<input type="radio"/>	<input type="radio"/>
New methods of pricing goods or services? (e.g. first time use of variable pricing by demand, discount systems, etc.)	<input type="radio"/>	<input type="radio"/>

Q2n.

Who developed these marketing innovations? *Check the most appropriate response.*

- Mainly your organisation
- Mainly your organisation together with other organisations or institutions
- Mainly other organisations or institutions

Q2o.

In 2013, approximately how many ideas for new marketing methods did your organisation generate?

	Number of ideas
Number of ideas for new marketing methods	<input type="text"/>

Q2p. For 2013, please estimate the percentage of marketing expenses that were assigned to marketing innovations.

Organisational Innovation

An **organisational innovation** is the implementation of a new organisational method in the firm's business practices, workplace organisation or external relations that has not been used before in the organisation.

- It must be the result of strategic actions taken by management.
- Exclude mergers and acquisitions, even if for the first time.

Q2q.

During the three years 2011 to 2013, did your organisation introduce...

If you haven't had any organisational innovations, please answer no below and skip to Question 3.

	Yes	No
New business practices for organising procedures? (e.g. first implementation of		

education/training systems, supply chain management systems, business re-engineering, lean production, and quality-management systems, etc.)

New methods of organising work responsibilities and decision making? (e.g. centralisation, decentralisation, team work, integration of departments, etc.)

New methods of organising external relations with other firms or public institutions? (e.g. first use of alliances, partnerships, outsourcing, subcontracting, etc.)

<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>

Q2t.

Who developed these organisational innovations? *Check the most appropriate response.*

- Mainly your organisation
- Mainly your organisation together with other organisations or institutions
- Mainly other organisations or institutions

Q2r.

In 2013, approximately how many ideas for of the above-mentioned organisational innovations did your organisation generate?

	Number of ideas
Number of ideas for organisational innovations	<input type="text"/>

Q2s.

In 2013, approximately how many of the above-mentioned organisational innovations did your organisation introduce?

	Number of innovations
Number of organisational innovations	<input type="text"/>

Contact: wolffr@tcd.ie
 School of Business, Trinity College Dublin, College Green, Dublin 2

APPENDIX B SURVEY INVITATION EMAIL

From: Frauke Wolf [mailto:noreply@qemailserver.com]
Sent: 15 October 2014 08:01
To: [REDACTED]
Subject: Qualtrics Survey: Trinity College Dublin Innovation and Organisational Culture Survey Invitation

Dear [REDACTED]

I am writing to invite your participation in a study of ICT firms in Ireland. The purpose of this study is to examine the impact of organisational culture on innovation within firms. This is an area which has not been fully researched within the Irish context and is of practical relevance to the management of ICT firms. I would really appreciate your participation in this study. It is anticipated that the results will benefit both innovation managers and academic knowledge.

The goals of the study are to:

- Understand the impact different dimensions of organisational culture have on innovation
- Establish whether the impact that organisational culture has on innovation differs for specific forms of innovation
- Determine whether there is a stronger relationship between organisational culture and innovation generation or innovation implementation

You are part of a random sample of ICT firms that has been chosen to complete a brief questionnaire about innovation and culture, a link to which you will find below. The survey is split into two parts with separate questions on innovation and organisational culture and will take about 10 minutes to complete. It has already been tested with Directors of ICT firms. Part 1 of the survey focuses on innovation and is aimed at a single respondent in a senior management role with knowledge of innovation activities. Part 2 is aimed at employees at all levels of the organisation. Responses are needed from one senior manager on the innovation questions and at least three other employees (senior managers, middle managers, lower-level managers), providing as much a representative cross-section as possible, in order to ensure the reliability and validity of the research results. I would ask you to please forward the survey link to respondents in your organisation meeting the above characteristics. Please note that you might potentially be contacted for further data collection in the future.

Follow this link to the survey:

Take the Survey

Or copy and paste the URL below into your internet browser:

https://qtrial2014.az1.qualtrics.com/WRQualtricsSurveyEngine/?SID=SV_b72JC36RVhbCaot&RID=MLRP_0lgG3SAihXsKFyB&_=1

This survey is confidential. No individual response or firm will be identified. Should you have any questions or comments, feel free to contact me by phone at 085 761 2186 or by email at wolffr@tcd.ie. I really appreciate your help with this survey.

Best Regards,

Frauke Wolf

APPENDIX C INTERVIEW GUIDE

INTERVIEW GUIDE

Introduction

I want to thank you for taking the time to meet with me today. My name is Frauke Wolf and I would like to talk to you about your experiences with innovation in your organisation. The interview should take less than an hour. I will be taping the session because I don't want to miss any of your comments. Although I will be taking some notes during the session, I can't possibly write fast enough to get it all down. Because we're on tape, please be sure to speak up so that we don't miss your comments. All responses will be kept confidential. This means that your interview responses will only be shared with research team members and we will ensure that any information we include in our report does not identify you as the respondent. Remember, you don't have to talk about anything you don't want to and you may end the interview at any time. Do you have any questions about what I have just explained? Are you willing to participate in this interview?

During the interview, I would like to discuss the following topics: organisational culture, innovation, and how your organisation supports innovation. With these topics in mind...

Organisational Culture

Main Questions	Additional Questions	Clarifying Questions (To be used as needed)
How would you describe the culture in your organisation?	How did you learn about your organisation's culture?	<ul style="list-style-type: none"> • Can you expand a little on this? • Can you tell me anything else? • Can you give me some examples?
Which of the facets of your organisational culture would you consider to be key elements in supporting innovation?		

Innovation

Main Questions	Additional Questions	Clarifying Questions (To be used as needed)
What is the scope of innovation in your organisation – all different forms of innovation – product, process, organisational, marketing?	Have you noticed any preference for innovation forms that are being implemented? Why is that?	<ul style="list-style-type: none"> • Can you expand a little on this? • Can you tell me anything else? • Can you give me some examples?
How important is innovation for your organisation?	Is innovation equally as important in all departments?	
How easy is it to innovate in your organisation? What kinds of support for innovation are in place?		
Could you tell me about the decision making process with regard to your organisation's innovation strategy?	What autonomy to make innovation decisions does the local subsidiary have? Does that decision-making autonomy depend on the form of innovation?	
Does the subsidiary have a dedicated mandate for innovation?	Are you aware of any innovation initiatives in the organisation that go beyond the subsidiary's mandate?	

Closing Component

Is there anything more you would like to add?

Thank you for your time.

APPENDIX D INTERVIEW INVITATION EMAIL

From: Frauke Wolf | Trinity Business School [mailto:wolffr=tcd.ie@mail142.suw14.mcdlv.net] **On Behalf Of** Frauke Wolf | Trinity Business School
Sent: 26 February 2016 18:24
To: [REDACTED]
Subject: TCD Innovation Survey - Interview Follow Up

[View this email in your browser](#)



Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Dear [REDACTED]

Firstly, thank you very much for participating in the Trinity College Dublin Innovation Culture Survey last year.

In the second phase of our study into organisational culture and its impact on innovation in the Irish ICT sector, we are looking to conduct interviews with survey participants. Ideally, we would like to follow up with the person who responded to the innovation section of the Innovation Culture Survey, or someone in a similar role.

The second phase of the study is designed to follow up on the findings from the first phase and to explain the findings from the survey. This additional data will help to explain some of the linkages between organisational culture and innovation, especially in the context of multinational subsidiaries.

Topics Covered in the Interview:

- How do companies describe their organisational culture?
- What facets of culture do companies find important to support innovation?
- How important is innovation to companies?
- What forms of innovation do companies engage in?
- How are companies determining where to innovate?
- Do companies have a dedicated mandate for innovation?

There's Value in Participating:

Participants will learn how, comparatively, they are approaching innovation and how their culture supports it. Organisational culture and innovation will be reported on in the aggregate and will not be tied to specific companies. Confidentiality of the participants and company will be guaranteed. This study has been reviewed and received ethics clearance through the Research Ethics Review Board at Trinity Business School, Trinity College Dublin.

How to Participate:

The interview will initially require up to 1 hour, with a possible similar follow-up time. It will take place in a mutually agreed upon location or over Skype. Participation in this study is voluntary. The participant may decline to answer any of the interview questions if he/she so wishes. Further, he/she may decide to withdraw from this study at any time without any negative consequences by advising the researcher. With the participant's permission, the interview will be tape-recorded to facilitate collection of information, and later transcribed for analysis. Shortly after the interview has been completed, we will send the participant a copy of the transcript to give him/her an opportunity to confirm the accuracy of our conversation and to add or clarify any points that he/she wishes. All information provided is considered completely confidential. The participant's name will not appear in any report resulting from this study, however, with his/her permission anonymous quotations may be used.

[Click here to indicate your interest in participating in an interview.](#)

Should you have any questions or comments, feel free to contact me by phone at 085 761 2186 or by email at wolffr@tod.ie. Thank you in advance for your assistance in this project.

Best Regards,

Frauke Wolf
PhD Researcher
Trinity Business School
Trinity College Dublin

APPENDIX E INTERVIEW CONSENT FORM

CONSENT FORM

I have read the information presented in the invitation letter (email with subject line TCD Innovation Survey - Interview Follow Up) about a study being conducted by Frauke Wolf and Prof. Louis Brennan of Trinity Business School at Trinity College Dublin. I have had the opportunity to ask any questions related to this study, to receive satisfactory answers to my questions, and any additional details I wanted.

I am aware that I have the option of allowing my interview to be recorded to ensure an accurate recording of my responses.

I am also aware that excerpts from the interview may be included in the dissertation and/or publications to come from this research, with the understanding that the quotations will be anonymous.

I was informed that I may withdraw my consent at any time without penalty by advising the researcher.

This project had been reviewed by, and received ethics clearance through, the Research Ethics Review Board at Trinity Business School, Trinity College Dublin.

With full knowledge of all foregoing, I agree, of my own free will, to participate in this study.

YES

NO

I agree to have my interview recorded.

YES

NO

I agree to the use of anonymous quotations in any thesis or publication that comes of this research.

YES NO

Participant's Name (please print) _____

Participant's Signature _____ Date: ____

APPENDIX F MAXQDA CODING

Code System		285
Code System		285
Subsidiary Position in MNC Network		0
HQ Sub Relationship		7
Sub Autonomy		16
Sub Mandate		14
Expectation to Innovate		6
Organisational Factors		30
Innovation		132
Organisational Culture		80

Code System		285
Code System		285
Subsidiary Position in MNC Network		43
Organisational Factors		0
Strategic Leadership		0
Vision		2
Mission		5
Leadership		8
Leadership Support of OC		3
Organisational Structures/Processes		8
Org History		4
Innovation		132
Organisational Culture		80

Code System		285
Code System		285
Subsidiary Position in MNC Network		43
Organisational Factors		30
Innovation		0
Attitude towards Innovation		40
Organisational Innovation Supports		0
Organisational Culture as Driver of Innovation		3
Innovation Process/Systems		13
Org. Structures/Process relating to Innovation		17
Dedicated Innovation Space		5
Company Events to Support Innovation		6
Innovation Strategy		10
Scope of Innovation		20
Organisational Innovation		3
Marketing Innovation		1
Service Innovation		1
Process Innovation		7
Product Innovation		6
Organisational Culture		80

Code System		285
Code System		285
Subsidiary Position in MNC Network		43
Organisational Factors		30
Innovation		132
Organisational Culture		4
Visible Elements of Organisational Culture		15
Organisational Culture Dimensions		0
Empowerment		11
Organisational Support of Employees		3
Support for Change		4
Proactiveness		5
Openness		13
Risk-taking		3
Attitude towards Failure		2
Diversity		3
Authenticity		2
Humility		2
Business-minded		1
Types of Organisational Culture		0
Hacker Culture		4
Innovative Culture		5
Learning Culture		1
Organisational Culture Development		1
Changes in Organisational Culture over Time		1

APPENDIX G INTERVIEW TRANSCRIPT SUBSIDIARY C

- 1 R: Hello?
- 2 I: Hello? Hello, can you hear me now [name]?
- 3 R: Hi. I can.
- 4 I: Oh finally, brilliant! Sorry I mispronounced your name, I need a coffee obviously
5 this afternoon. How are you?
- 6 R: *[laughs]* Not to worry, I'm not too bad thanks. And you?
- 7 I: Good, good. I don't know what happened there with Skype, it can be a bit
8 temperamental sometimes I think.
- 9 R: Ah, can't we all *[laughs]*
- 10 I: Yeah, exactly!
- 11 R: So, how are you doing? So, what's in store for me this afternoon? Lots of questions, I
12 suspect.
- 13 I: Yeah, lots of questions. So I'll start off and try and get the - basically the
14 housekeeping out of the way first.
- 15 R: Okay.
- 16 I: So, first of all thank you very much for taking the time to talk with me today.
- 17 R: No problem.
- 18 I: So, just to let you know that all responses will be kept confidential so that means
19 that any responses you give during the interview will only be shared with the
20 research team members and that means that we will ensure that any information
21 that we include in any report or thesis that comes out of this study does not
22 identify you as a respondent.
- 23 R: Okay. Good.
- 24 I: So you don't have to talk about anything that you don't want to talk about and
25 you also may end the interview at any time.
- 26 R: Okay, no problem.
- 27 I: Okay, so during the interview then I would like to discuss – basically the main
28 topics of our study is organisational culture and innovation and then also talk
29 about in detail how [your organisation] actually supports innovation.
- 30 R: Okay.
- 31 I: So, starting off then with these topics in mind, how would you generally describe
32 the culture in your organisation?
- 33 R: *[pause]* I would say friendly, let me see – friendly, kind of business-centric, you know,
34 people mean business, they get on about their - you know, social, I would say people
35 are eager to kind of make a difference, so kind of enthusiastic. They're the sorts of -
36 That's the sort of sentiment that you'd see.
- 37 I: Okay, brilliant.

- 38 R: And I'd say humble as well maybe, humble.
- 39 I: Okay, that's a good one. So, when you joined [the organisation] yourself, how did
40 you come to learn about its specific organisational culture?
- 41 R: I joined about three years ago and I guess I'd always be a – as a HR person, I guess I'd
42 always be a fan of looking at kind of the facts and the symbols and kind of some of the
43 things that you'd see around so, you know, even paying attention to, like, how people
44 are dressed, the – the kind of meetings, how people eat at the canteen, how busy is the
45 reception, like, all of that kind of stuff together to get a flavour of the dynamic or
46 what's the energy like within it ...
- 47 I: Mmm.
- 48 R: ... and then you'd also look at, I guess, what's rewarded and then what are the –
49 people's reactions to kind of comments, say, in meetings and what appears to be valued
50 or what isn't it and what gets attention and what doesn't. Those sorts of things.
- 51 I: Okay, so talking about those sorts of things, we've seen more kind of the – the
52 visible sort of facets of organisational culture, when you joined was there any kind
53 of induction training that was given that specified what the culture was like, what
54 was important, anything along those lines?
- 55 R: Not at the time.
- 56 I: Okay.
- 57 R: We do a lot of e-learning on – and I would have had a lot of reading to do and then
58 there was, like, a small induction presentation but I don't think at the time culture was
59 specifically called out but I would have joined [the organisation] at the time of [previous CEO]
60 maybe there wouldn't have been the same emphasis on culture that there is today. So,
61 like, for example our CEO, [name], describes himself as the culture curator and
62 that's his role.
- 63 I: Mmm.
- 64 R: So, very different. Old [organisation] versus the [organisation] of today.
- 65 I: Okay. So, which of the facets of the organisational culture that we're talking -
66 about now, which of the facets of organisational culture would you
67 you consider to be key elements in supporting innovation?
- 68 R: So, would you want examples of the sorts of things that we're doing or what would
69 help you here?
- 70 I: Any type of – are there any specific programmes around innovation culture? Are
71 they – do you have any processes or structures in place to support innovation?
72 Anything that's really done from an organisational point in order to support
73 innovation in the business.
- 74 R: So, I think there would have been some training done on kind of intrapreneurship
75 if you know what I mean?
- 76 I: Mmm.

- 77 R: Coming up with kind of business development ideas kind of locally and then
78 submitting those to Corp. So, for example, we would have had teams, engineering
79 teams in particular working on - being made accountable to work on innovative pieces
80 of technology. So, for example, we would have had teams who worked on the
81 keyboard that comes - you know, the touchpad that comes up on laptop screens, so we
82 would have had teams kind of working on that but that would have been a specific
83 charter that they would have had to build and work around or just even just kind of
84 small - while there can be some big game-changing stuff, like, I don't know, creating
85 an [product] or whatever, a lot of the stuff the teams in Ireland would do would be kind of
86 incremental innovation.
- 87 I: Okay.
- 88 R: Kind of process improvement or - or innovating around, you know, software code that
89 does things differently, more efficiently, those sorts of things. Or, like, the experience
90 of the customer as they engage with your product if you know what I mean.
- 91
- 92 I: Mmm.
- 93 R: So we would have done a lot of training around kind of intrapreneurship. What else?
94 The sort of stuff, things that we do now would be - we run a global hackathon every
95 year and that's essentially over a day or potentially over a week, across - people from
96 different parts of the business will come together and work on a project of their choice
97 and that could be anything from - from, like, stuff for charities, you know, getting
98 people from [charity] to use technology to, you know, re-purpose the [product]
99 technology to enable people with physical disabilities to kind of use technology to have
100 - to do things that they wouldn't normally be able to do. So, we would - you know,
101 and that would range from finding new technologies to kill bugs in software, to kind of
102 the - the kind of the [charity] stuff as an example. We - as well the - we also
103 would have a [innovation event] which is kind of a global concept within [organisation], you can
104 probably research it, and the idea is that you kind of - people can stay late and code
105 and work on whatever project they kind of want.
- 106 I: Mmm.
- 107 R: And they kind of get pizza and beers and they can do what they want and various
108 people would do that. So, that's kind of a vehicle that's there for them. Like, we would
109 have an area now kitted out in one of our buildings which is a kind of a hack space and
110 we also have a kind of a maker's studio if they want to make stuff. So it has, like, a
111 soldering iron and various things like that.
- 112 I: Oh, okay, very good.
- 113 R: Yeah.
- 114 I: Is there anything else that you would like to add on that?
- 115 R: They would be the big things and I guess - I know that people were trained on even,

- 116 like, the definition of innovation. So whether it's like breakthrough stuff or more kind
117 of continuing improvement there would have been quite a bit of work done maybe
118 around 2012/2013, in and around that kind of timeframe but one of the things that
119 we're really trying to drive now ourselves is, like, an innovative culture and, as you
120 know [our organisation] is opening up a new building. We're moving to a new building in
121 October and we're being very deliberate in thinking how do we create the environment
122 and the right kind of visual cues to make it easy and the right kind of way to create
123 more innovation. So, even simple things like locating – finding out where you're going
124 to locate the pool tables or the table tennis area so that you maximise the chance of
125 kind of collisions between people from different disciplines so they can get to know
126 each other and then who knows what might happen.
- 127 I: Okay, that's brilliant. So, looking then generally at - I'd say, the scope of
128 innovation at [your organisation], would you say that it covers the entire scope of
129 innovation across the four main different forms? So, product, process,
130 organisational and marketing? Or is there a certain focus on one of those?
- 131 R: I would say different departments would have different emphasis in each of those four
132 areas. Product, process, marketing and – what was the other one?
- 133 I: Organisational.
- 134 R: ... organisational, and an example of an organisational? Just so I'm clear.
- 135 I: An example of organisational innovation would just be new methods in organising
136 - so, organisational methods, for example.
- 137 R: Okay. Okay. I would say [pause] depends on how you look at it. Based on the size of
138 the employee population we probably have more people in process than
139 organisational innovation – more time. There is obviously areas in engineering and in customer
140 marketing and customer service that would be in product innovation. So, it's kind of -
141 like, we've about 1,300 employees and to give you an idea if you've maybe – maybe
142 you have 200 or so engineers who would – who would touch kind of product
143 innovation and then the balance of – then you'd have maybe 4-500 people maybe
144 between engineering process or – or business process innovation, there'd be a high
145 chunk of people doing that, but that would outweigh the product guys ...
- 146 I: Okay.
- 147 R: ... but potentially all four would be here in different aspects depending on the area of
148 the business that you're working with.
- 149 I: And from a core sort of perspective, have you noticed any preference for specific
150 innovation forms or is innovation driven across all those different forms?
- 151 R: I don't think there's a preference. I think obviously the one that would have got the
152 most PR is the product, you know, a new game-changing product – [product example] or things
153 like that, they would tend to grab the attention. But more recently lots of references
154 have been made to kind of streamline the process ...

- 155 I: Mmm.
- 156 R: ... and become more efficient and more integrated because [organisation] I guess has
157 grown up as a company that's, you know – it's huge, it's – it's quite siloed in many
158 ways, there's lots of different departments, some are of huge scale and more recently
159 there's been more focus on kind of driving greater integration around kind of process
160 to stop kind of duplication and different teams going off doing their own thing.
- 161 I: Okay.
- 162 R: So you'd have more integrated kind of IT process or technology supporting things,
163 like, one you'd hear talk of, like, one consistent engineering system versus different
164 tools, for example, being run by the [product name] business versus the [product name]
165 business. But
166 essentially those tools would have the same purpose but they're being designed
167 specifically for the needs of either organisation instead of having one tool that cuts
168 across everybody.
- 168 I: Okay.
- 169 R: So that's the kind of – more of a shift – more of that process stuff is kind of being
170 valued now.
- 171 I: Mmm. And across all those different forms of innovation then, how important
172 would you say innovation generally is for [organisation]?
- 173 R: For [organisation], I think the – like, our CEO has said our industry doesn't expect -
174 doesn't respect tradition, it only respects innovation. So I think from the top-down, it's
175 very clear what the focus and the priority is. So I think people – whether it's process
176 innovation or people – teams coming together from an engineering side, from product
177 development right the way through to customer services and, you know, supply chain
178 and everything in between, people are aware of how they would contribute to that
179 agenda.
- 180 I: Okay. And would you say – so we've mentioned that obviously the – the type of
181 focus on the different forms of innovation is different from – well, it's different
182 between different functions ...
- 183 R: Mmm.
- 184 I: ... but would you say that innovation is actually equally as important across all of
185 the functions or are there functions where there is a bigger focus on it?
- 186 R: *[pause]* The process one is interesting because I think it's hard to differentiate what is,
187 you know, the basics of running a process efficiently in a – kind of a normal
188 maintenance kind of manner and then a subsection then of people maybe innovating to
189 make that process more efficient.
- 190 I: Mmm.
- 191 R: So I don't know if I've quite answered your question, just say it again so I can be clear.
- 192 I: So, really just if we're looking across departments ...

- 193 R: Mmm.
- 194 I: ... so, for example, if we're looking across HR or engineering or sales ...
- 195 R: Mmm.
- 196 I: ... would you say that innovation would be equally important in all those
197 departments or is there a certain ...
- 198 R: No, I'd say there'd be a bias in – in some departments over others. Where, for example,
199 as I said you might find some people – there might be more focus on efficiency and
200 scale and doing things quicker, faster, better and then other areas might be given more
201 latitude or sub-teams within it to really have an innovative agenda.
- 202 I: Mmm. And could you expand on where – where the latter would happen? Those
203 sub-teams.
- 204 R: Primarily engineering.
- 205 I: Mmm.
- 206 R: And if you think of it like as a product that's what we kind of do, come up with new
207 products ...
- 208 I: Yeah.
- 209 R: ... so we would get, like, you know, we operate kind of agile engineering, so
210 kind of that creative mindset and trying new things, you know, doing experiments and
211 using kind of telemetry and kind instrumentation to tell you how effective that – that
212 change in your code as an example has been and how is that driven, you know, usage
213 patterns and how is it different. So that's kind of a way of working kind of in – in
214 engineering and in fact you'll even have people working on super secret stuff that I
215 couldn't tell you about, that's kind of in the early stages of the innovation process ...
- 216 I: Okay.
- 217 R: ... here. But for the most part it would be in the kind of engineering area and then in
218 the other areas, back to the more commercial areas it's more around kind of process
219 and then you'd have smaller teams within that, almost like Six Sigma and those sorts
220 of guys looking at how to kind of innovate their process to be more effective.
- 221 I: Okay. So, how easy then would you say is it to innovate at [organisation]
222 generally?
- 223 R: I think it's – it's [pause] – I think it's in some areas it's – it's after the – if you use the
224 broad definition of innovation, yeah, people can do it in their daily jobs but to have
225 real what I call breakthrough innovation around kind of the bigger stuff, less so and
226 that's I think by virtue of some of that kind of real significant game-changing breaking
227 stuff tends to be run out of the US.
- 228 I: Okay.
- 229 R: So you might have smaller teams in Ireland that would contribute to elements of it or
230 They contribute to what they're working on in the US but it wouldn't be currently as it
231 is today on the same scale as America, if you know what I mean.

- 232 I: Mmm. And are there any kinds of support for innovation in place at [organisation]
233 in order to contribute to these breakthrough innovations then? Are there
234 any – say, are there any assistance in place to capture new ideas, that sort of
235 Thing?
- 236 R: No, there isn't but it's the kind of culture that, you know, if you get an idea, there's
237 nothing stopping you taking it wherever it needs to go. Like, you can – if you want to
238 mail the CEO and say you've a cool idea for a product, off you go.
- 239 I: Mmm.
- 240 R: So it's quite open.
- 241 I: So, quite an open door policy with that.
- 242 R: Yeah, like, and, like, one of the things that surprised me when I joined was, like, the
243 frequency of the executives and how often they would come and they'd want to hear
244 kind of the feedback from what's happening on the ground and kind of take it back.
245 You know, and even you have some of the – probably the most innovative people in
246 the company, they would visit us and they would – one of the things that we would do
247 is - we kind of call it the travel tax for any – kind of the really senior engineers who are
248 kind of like, innovation is their day job, they would come and they would have to do
249 what we call a tech walk and they would share, you know, either their journey, what it
250 is that they've done or talk about the piece of technology that they've developed. So,
251 really trying to create that learning culture. And then often we would – we'd try and
252 run our own hacks for a particular project or pain points that we see and try and, you
253 know, bring people together to kind of define that problem and come up with a way of
254 fixing it and then the outcome of those, those projects we will quite readily share with
255 executives to see is the experience – what we've seen in Ireland – have you seen that
256 in other larger markets and can we bubble this up to some kind of global solution.
- 257 I: Okay. And if we move on then to talk about, [name], the decision-making process
258 with regard to innovation. Could you tell me about the decision-making process
259 with regard to the – to [organisation]'s innovation strategy?
- 260 R: [pause]
- 261 I: In terms of how much of that happens at [organisation], how does it work in
262 conjunction with Corp, who takes the lead on what within that process?
- 263 R: I think it's done in partnership with the US so they kind of have regular planning
264 meetings and decide what they're going to build or design over the next year/quarter,
265 you know, there's kind of strategy planning framework so – so invariably senior guys
266 in the US would write a vision, some sort of a specific vision associated with their
267 products and then they map out then what are they going to develop over the next 12/
268 18 months, what are the kind of types of technology or the experiences that they want
269 to – to have and then engineering teams in particular who support those products
270 would be tasked then to start building and creating the technology that contributes to

- 271 that vision on a quarterly basis. Then their progress is kind of reviewed and that's kind
272 of how it works broadly.
- 273 I: Mmm.
- 274 R: So the Irish teams will contribute into that. So, for example, even in terms of that kind
275 of planning memo which takes from the vision, you know, Irish teams will contribute
276 into because they'll know maybe pieces of the technology or piece of the process and
277 they'd write – they'd, you know, insert their ideas into what could be done or not.
- 278 I: Okay. So, what – if we look at that in more detail generally, what would you say -
279 what level of autonomy to make its own decisions on innovations does [organisation]
280 have?
- 281 R: I would say it tends to be quite centralised. So, it goes back up to – I mean you can -
282 going back to the I suppose either these concepts I talked about, the [innovation event] or, like,
the
283 hackathon, like you can do what you want in those but then if there's a structured plan
284 around an area of innovation or product that they wanted to build then it's pretty
285 structured.
- 286 I: Mmm.
- 287 R: That you execute against that, you innovate against that but there's, like, themes that
288 you're to go away and explore if you know what I mean and then you're reviewed
289 kind of quarterly in terms of the progress that you've made and what are the – where
290 do you need more help, where don't you, are you going – are you building this as
291 quickly as you can, what else can we do to kind of make it better.
- 292 I: Mmm. So, does that sort of autonomy or that sort of leeway then, does that
293 actually depend on the form of innovation in question? So, would it change for
294 product innovation or process innovation or the other two forms of innovation?
- 295 R: So, predominately the – the process I've just outlined would broadly be used for
296 engineering.
- 297 I: Okay, so mostly product in that case.
- 298 R: Yeah, mostly product. The other process stuff is more whatever governance or change
299 protocol they'd have around their systems and tools and process, it would go through
300 that.
- 301 I: Okay. And in terms of, say, marketing innovations or organisational innovations,
302 what would it look like regarding that for [organisation]?
- 303 R: I think it would be fair to say marketing is pretty tightly controlled.
- 304 I: Okay.
- 305 R: If you think of it in terms of having a consistent brand equity. Yes, you've freedom to
306 execute against the brand but all of your marketing collateral and stuff would come
307 from Corp and you'd be expected to just kind of use that and I don't think you'd have
308 much support if you deviated from it.

- 309 I: Mmm.
- 310 R: Organisational, it's – it's – it almost depends on where the leader is, so if the leader is
311 in [location], has accountability for the area then you can, you know, innovate where you
312 want and it's the leader's accountability to manage the executive in the US or
313 whatever to get the support for whatever that they need. So it's kind of a healthy
314 balance but it depends on how integrated the system or the process is, you know,
315 whatever the organisational issue is but, like, we can innovate – from a HR side I can -
316 for the most part I can innovate within reason where I want to and then if I need to – if
317 it's like a global process, well then naturally there's a process that I have to go to to
318 innovate and to feed in my feedback on that.
- 319 I: Mmm.
- 320 R: It's kind of like a healthy balance, it just depends on the – the control, how global, how
321 scaleable, how systematic is – is, you know, one of the processes or organisational
322 practice that you're going after.
- 323 I: So, moving onto the next part then. So, one of the areas that came out of the study
324 as such was the question whether the subsidiaries or [organisation] in this
325 case, whether it has a dedicated mandate for innovation from global
326 headquarters.
- 327 R: Certain – it's back to – the organisation has been quite fragmented, so some parts do,
328 some parts don't.
- 329 I: Mmm.
- 330 R: But, back to the point of [name], the CEO, everyone has to have an innovative culture.
331 see what I mean?
- 332 I: Yeah. So, around what areas then would [organisation] have a very dedicated
333 mandate for innovation? Would it be more around those global product
334 innovation processes where – we discussed before where engineers ...
- 335 R: Yeah. It's mostly engineering and product. And then for some of the operational
336 areas they might have some process capability stuff that they've to do around product
337 launches and systems that they use to support product launches or customer billing
338 arrangements. There would be people who would work on that.
- 339 I: Alright, okay. So, would you be aware then of any innovation initiatives that go on
340 in – or at [organisation] that would go beyond the mandate as such?
- 341 R: We would try and do – how will I describe it, maybe some skunk work to – to prove a
342 concept ...
- 343 I: Mmm.
- 344 R: ... and trial stuff. And that would be more around kind of hacking a problem or
345 hacking an issue and then kind of assessing the feasibility of something so you kind of
346 do that first before you'd kind of figure out where you'd go to take it. So it would get
347 the level of investment or additional air that it needs to make it a reality.

- 348 I: Mmm. So is there a dedicated process for that or ...?
- 349 R: No. No.
- 350 I: Very ad hoc, is it?
- 351 R: It's ad hoc and then, like, the local leadership team would support it where it needs to.
- 352 But it's not as streamlined, say, as the other global processes that we would have, say,
- 353 on the product side.
- 354 I: So people generally in the business then, if they came up with an idea, would they
- 355 know where to go with that idea in order to develop it?
- 356 R: Generally, I guess if it's within their sphere of influence or their familiarity or area, I'm
- 357 sure they would. More broadly, if they have a crazy idea for a product that we haven't
- 358 thought of they – they could use it as a project for the hackathon. But then the channel
- 359 wouldn't be as clear maybe as, say, a suggestion box, you know, that maybe some
- 360 companies use.
- 361 I: Mmm. Okay. So that's – that's it from my side really. Is there anything more that
- 362 you would like to add that would help us in understanding the innovation
- 363 processes at [organisation]?
- 364 R: No, I don't think so.
- 365 R: So, best of luck anyway with your studies. You don't need anything else from us at this
- 366 stage?
- 367 I: Not from this stage, no.
- 368 R: That's good. I thought I was going to be grilled on all sorts of statistics!
- 369 I: [laughs] No.
- 370 R: I was - I'm going to be found out here, now! *[laughs]*
- 371 I: No, that was never my intention! *[laughs]*
- 372 R: Okay, very good. Well best of luck and be sure to send on, like, I'd love to read
- 373 whatever the output of your studies are, you know, obviously in a summary form or
- 374 whatever, it's just an area of huge interest for me so – so where it makes sense I'd be
- 375 delighted to see it and if you want any help in the future feel free to give us a shout, no
- 376 problem.
- 377 I: Okay, thank you very much.
- 378 R: No problem best of luck anyway. Take care now
- 379 I: Take care now. Bye bye.
- 380 R: See you. Bye.
- 381 I: Bye.
- End of recording

APPENDIX H EXPLORATORY FACTOR ANALYSIS RESULTS FOR AUTONOMY AND TEAMWORK (N = 37)

	Rotated Factor Loadings	
	1	2
We actively encourage cooperation across different parts of the organisation.	.78	.28
Teamwork is used to get work done, rather than hierarchy.	.63	-.02
Teams are our primary building blocks.	.57	.27
People work like they are part of a team.	.57	.11
Business planning is ongoing and involves everyone in the process to some degree.	.49	.16
We have the freedom to decide how we are going to carry out our projects.	.48	.29
Our decision making process can best be described as consensus building.	.05	.86
There is a great deal of tolerance of individual working styles.	.43	.54
Eigenvalues	2.31	1.31
% of variance	28.85	16.36

a. Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.

b. Rotation converged in 3 iterations.

APPENDIX I EXPLORATORY FACTOR ANALYSIS RESULTS FOR SUPPORT FOR CHANGE (N = 37)

	Rotated Factor Loadings	
	1	2
The way things are done is very flexible and easy to change	.96	.13
New and improved ways to do work are continually adopted.	.75	.09
New ideas are encouraged.	.61	.24
We are willing to experiment.	.56	.08
Attempts to create change usually meet with resistance.	.38	-.17
We are quick to take advantage of opportunities.	.17	.91
We often search for new opportunities in the external environment.	.01	.72
Everyone believes that he or she can have a positive impact.	.06	.68
Eigenvalues	2.35	1.93
% of variance	29.42	24.12

a. Extraction Method: Principal Axis Factoring. Rotation Method: Varimax with Kaiser Normalization.

b. Rotation converged in 3 iterations.

APPENDIX J EXPLORATORY FACTOR ANALYSIS RESULTS FOR RISK-TAKING (N = 37)

	Factor Loadings
Innovation and risk-taking are encouraged and rewarded.	.77
Uncertainty is viewed as opportunity, not as risk.	.77
Failure is acceptable, if the effort on the project was good.	.73
We have a good mechanism for encouraging and developing creative ideas.	.67
We view failure as an opportunity for learning and improvement.	.66
Innovation is a core value.	.59
Eigenvalues	2.96
% of variance	49.25

a. Extraction Method: Principal Axis Factoring.

b. Only one factor was extracted. The solution cannot be rotated.

APPENDIX K EXPLORATORY FACTOR ANALYSIS RESULTS FOR TRUST AND OPENNESS (N =37)

	Factor Loadings
Information is widely shared so that everyone can get the information he or she needs when it's needed.	.87
We freely share information around the organisation.	.76
Differing views are encouraged.	.75
There is a high degree of organisational trust.	.64
Our compensation formula is well aligned with our organisation's goals.	.57
Eigenvalues	2.63
% of variance	52.54

a. Extraction Method: Principal Axis Factoring.

b. Only one factor was extracted. The solution cannot be rotated.

APPENDIX L EXPLORATORY FACTOR ANALYSIS RESULTS FOR CONSTRUCTIVE CONFLICT (N = 37)

	Factor Loadings
We are encouraged to challenge decisions and actions if we think there is a better way.	.80
Everyone takes responsibility for his/her own actions.	.75
We challenge each other's ideas in a constructive way.	.70
We directly confront problems.	.65
When disagreements occur, we work hard to achieve win-win situations.	.61
It is easy to reach consensus, even on difficult issues.	.47
Eigenvalues	2.71
% of variance	45.10

a. Extraction Method: Principal Axis Factoring.

b. Only one factor was extracted. The solution cannot be rotated.