Developing the Microfoundations of Dynamic Capability for Innovation:

A Human Resource Management Perspective

By

Lucy Fallon-Byrne

MA, MBA.

A Thesis Submitted to Dublin City University Business School

for the award of the degree of

Doctor of Philosophy

Research Supervisors: Dr. Brian Harney and Professor David Jacobson

Declaration

I hereby certify that this material, which I now submit for assessment on the programme of study leading to the award of a degree of Doctor of Philosophy (PhD) is entirely my own work, that I have exercised reasonable care to ensure that the work is original and does not to the best of my knowledge breach any law of copyright, and has not been taken from the work of others save that to the extent that such work has been cited and acknowledged within the text of my work.

Signed: _____ **ID No:** 57125147

Date: _____

Dedicated to my dearest sister Dympna, my eight sisters and brother Jim, my darling daughter Emma and the memory of my late and great parents, James and Teresa Fallon.

Acknowledgements

I would like to acknowledge everyone who helped me on my PhD journey.

First and foremost, I would like to sincerely thank my supervisors. I cannot express enough my deep gratitude to Dr. Brian Harney and my appreciation of his tireless support and generosity to me in undertaking this research. He patiently shared with me the breadth of his knowledge, wisdom and expertise and if there is such a thing as a model of best practice in the role of supervisor, then I was fortunate enough to have benefited from this with Dr. Brian Harney. I would like to thank Professor David Jacobson for his immeasurable support and patience which propelled and sustained me throughout the journey. Professor Jacobson introduced me to the world of economics and dynamic capabilities and spared no effort in sharing his great knowledge and in nurturing my new found interest in this area. I would like also to thank Professor Patrick Flood for encouraging me to undertake a PhD and helping to maintain my resolve in the early stages of the programme.

To the staff in the Business School I extend my warm thanks, particularly to Professor Colm O' Gorman and to the Directors of the doctoral programme Dr. Siobhan McGovern and Dr. Teresa Hogan who offered encouragement, support and enthusiasm at all times and to Dr. Edel Conway and Dr. Na Fu for their expert assistance with the statistical analysis and their unwavering kindness and patience. To my fellow classmates, I say a big thank you, particularly to James Kavanagh, Dr. Lorcan O' hObain, Dr. Louise Chalkley, Paul McBride, Eric Brady, Brian Forbes and Diane Dignam. Most particularly, I would like to thank Dr. Terence Ahern, who soldiered with me and gave generously of his time and knowledge.

I would like to acknowledge the National Centre for Partnership and Perfromance (NCPP) and the Department of the Taoiseach for agreeing to fund my PhD and the staff of the NCPP for their great support through the early years, most especially Gaye Malone and Val Whelan for their untiring help and encouragement. I would like to thank also the staff and management of the Department of Social Protection who allowed me the scope and the flexibility to persevere with the project. My DSP colleagues, in particular Anne Vaughan, John McKeon, Helen Faughnan, Anne Tynan, Joan Gordon, Marie O'Neill, Caitriona Bracken, Aoife Kelly, Ciaran Denny and Fiona Feeney kept me in good humour throughout the final phases of the journey and kept my spirits alive to the very end.

Thanks to my family, my sisters Mary, Dympna, Nora, Evelyn, Patricia, Josephine and Teresa, and my brother Jim for staying with me and helping me to keep the faith and to my friends particularly to Catherine Byrne, Fionnuala Hussey, Joan Greer and Fiona Nulty for all the encouraging words and kindnesses and the multiple cups of coffee! Finally thanks and much love to my daughter Emma who is the sparkle in my life and makes everything worthwhile.

Table of Contents

List of Tables

List of Figures

List of Abbreviations

DC	Dynamic Capabilities
DCV	Dynamic Capabilities View
ESRI	Economic and Social Research Institute
HPWS	High Performance Work Systems
HR	Human Resources
HRM	Human Resource Management
NCPP	National Centre for Partnership and Performance
NIS	National Innovation System
NSI	National System of Innovations
RBV	Resource-Based View
SHRM	Strategic Human Resource Management
TCE	Transaction Cost Economics

Abstract

Developing the Microfoundations of Dynamic Capability: A Human Resource Management Perspective

This empirical study investigates the internal dynamics of organisational innovation and offers a developmental approach to building the microfoundations of dynamic capabilities for innovation (Teece, 2007; Abell et al., 2008). The study combines theory from the domains of dynamic capabilities and human resource management. The dynamic capabilities framework is located within a macro-level tradition and has not yet developed sufficient understanding of the micro-level organisational strategies which build innovation capabilities (Helfat and Peteraf, 2009; Barreto, 2010). The study, based on a large national survey of employees, represents a unique empirical opportunity to address this research gap. The findings from the investigation demonstrate that organisational innovation strategies are positively associated with innovation outcomes mediated by innovation climate. Outcomes investigated include product and service innovation and proximal employee outcomes such as job satisfaction and commitment (Wright and Gardner, 2003). A notable exception is wellbeing outcomes where the findings suggest a thin balance between challenge and stress so that innovation strategies cannot be seen as resulting in universal win-wins for all concerned (Geary and Trif, 2011; Ehrnrooth and Bjorkman, 2012).

The research findings enhance theory development, research and practice. Firstly, the study expands dynamic capabilities theory by outlining a developmental approach to building dynamic capabilities and elucidating microfoundations. It suggests a synthesising model for developing dynamic capabilities from microfoundations to macro level strategic higher order capabilities. Secondly, the investigation contributes to resolving the innovation black box problem (Becker and Gerhart, 1996; Guest, 2001, 2011; Takeuchi et. al., 2007) by demonstrating that innovation climate is an important mediator in the relationship between organisational innovation strategies and innovation outcomes. Thirdly, by analysing the responses of employees, which is rare in the literature (Macky and Boxall, 2007; Felin and Foss, 2005, 2009; Guest, 2011), the findings contribute to an empirical understanding of why and how particular strategies are linked to innovation outcomes and thereby illuminate the critical role of employees in the dynamic capabilities framework.

Chapter One: Introduction

1.1 Introduction

Increasingly it is acknowledged that innovation is critical for firm level success and broader economic development. Dynamic capabilities for innovation are said to enable organisations to build competitive advantage for today while creating sustainable competitive advantage for tomorrow. Yet while the significance of dynamic capabilities is well recognised, there is less understanding of the mechanisms of how dynamic capabilities are created and operate (Kraatz and Zajac, 2001; Barreto, 2010). In addressing this issue, this study focuses on the internal dynamics of innovation in organisations. The study aligns theory in the domains of dynamic capabilities and human resource management in order to develop greater understanding of the microfoundations of dynamic capabilities for innovation (Felin and Foss, 2005, 2009; Felin et al., forthcoming).

Dynamic capabilities theory provides an important theoretical framework for the study of innovation because it addresses the processes of future resource-creation, concentrating on how to create new resources and renew existing resources in line with changes in the environment (Teece et al., 1997; Bowman and Ambrosini, 2003). However, the framework is limited in its application because to date it has not yet developed sufficient understanding to link the development of capabilities with organisational strategies which affect innovation behaviour and build capabilities (Cepeda and Vera, 2007; Ambrosini and Bowman, 2009; Helfat and Peteraf, 2009; Bareto, 2010). This study addresses this gap by investigating how organisational innovation strategies and innovation climate can affect the innovation dispositions and behaviours of employees and therefore build dynamic capability for innovation.

1.2 Rationale and Aims of the Study

In Ireland the growing urgency to effect a transition from a production-based economy to an innovation-based economy has led to an increased focus on innovation (Strategy for Science Technology and Innovation 2006-2013, 2006; Innovation Ireland: Report of Innovation Task Force, 2010). As this surge to increase levels of innovation continues, there has been a significant increase in the analysis and study of Irish innovation policy (Leavy and Jacobson 1997; O'Riain, 2000, 2004; O'Gorman and Kautonen, 2004; Casey and Brugha, 2005; Hewitt-Dundas and Roper 2008, 2010) To date, however, Irish innovation policy, like

that of many other countries, has focused primarily on science and technological innovation (STI), with a particularly strong focus on formal research and development (Lorenz and Valeryre, 2005; Hilliard and Green, 2005; Jordan and O'Leary, 2007; Lin et al., 2010). Arguably such policy level considerations should be broadened, while at the same time complemented by a firmer appreciation of the role of innovative capacity at the firm level. One key rationale for this study therefore is to position organisational innovation more firmly in national innovation policy by highlighting that an understanding of internal organisational level dynamics is of strategic importance to national innovation success. The central proposition is that the innovation performance of firms is important for national and regional economic development; how firms organise themselves matters and must be given more prominence in national innovation policy (Lazonick, 2003; Laursen and Foss, 2003; Lundvall, 2007; Bender and Laestadius, 2008; Ramstad, 2009). In particular, the aim of this study is to identify and understand the internal organisational dynamics and arrangements which best support innovation.

The pursuit of this path is not without difficulty. Analysis of the internal organisational factors and the precise mechanisms which link practices to innovation performance have been somewhat neglected. The underlying internal organisational factors which elucidate the microfoundations of innovation capability have been largely '*black-boxed'* (Laursen and Foss, 2003, p. 246) and remain unexplained. The study aims therefore to open up this innovation black box by linking literature on dynamic capabilities, strategic human resource management (HRM) and organisational innovation (Hage 1999; Read 2000; Shipton et al*.,* 2006). From the integration of these literatures, a research model is developed. The aim of this research is to investigate the association between organisational innovation strategies and innovation outcomes, exploring the mediating effects of innovation climate as potentially one of the key variables in this strategies-innovation performance link (Boselie et al., 2005). The study explores why and how particular strategies are linked to increased innovation outcomes, and in doing so, wrestles with two persistent unresolved questions; the innovation black box problem in strategic human resource management (Becker and Gerhart, 1996; Boselie et al., 2005; Takeuchi et al., 2007; Guest, 2001, 2011) and the challenge of uncovering how the microfoundations of dynamic capabilities for innovation can be developed (Abell et al., 2008; Bareto, 2010). By combining the various strands of the findings from this research and integrating dynamic capabilities and strategic human resource management literatures, the study aims to contribute to the development of dynamic capabilities theory (Kratz and Zajac, 2001; Easterby-Smith, 2009; Bareto, 2010).

This is manifest in the development of a synthesising model which indicates how purposefully modifying the human resource base (Helfat and Peteraf, 2009) can achieve innovation outcomes, thereby elucidating the development of the microfoundations of dynamic capabilities from a HRM perspective.

Critical to the exploration of microfoundations, the current study explores the responses of employees. Researching the perspectives of employees addresses deficiencies in previous studies in human resource management and dynamic capabilities which have been predominantly based on the responses of employers (Wall and Woods, 2005; Macky and Boxall, 2007; Abell et al., 2008; Harney, 2009; Guest, 2011; Felin et al., forthcoming). Employees' perspectives on innovation and their contribution to innovation outcomes have also received much less attention in previous human resource management studies, studies which have largely concentrated on more distal performance outcomes such as financial outcomes, productivity, market value or quality (Laursen and Foss, 2003; Savanevicienne and Stankeviciute, 2010). Understanding workers' perceptions and actions is increasingly seen as the key to understanding the link between strategies, practices and performance (Guest, 2011). It is expected therefore that the analysis of the responses of employees will contribute to a deeper understanding of the causal link between strategies and innovation outcomes.

In summary, the primary aim of this research is to explore the internal dynamics of innovation in organisations by investigating the organisational innovation strategies and climate which are associated with innovation outcomes. This will involve assessing the relationship between specific organisational innovation strategies i.e. empowerment-enhancing strategies, communication and consultation, training and relational capital and innovation outcomes. Innovation outcomes examined include organisational outcomes in the form of new products, new services and workplace innovation and employee outcomes of commitment, job satisfaction and employee wellbeing. The study aims to examine the role of innovation climate as a mediator in the relationship between organisational innovation strategies and organisational and employee outcomes. By undertaking this research and analysing its findings, the study aims to contribute to opening up the innovation black box in the strategic human resource management field (Becker and Gerhart, 1996; Guest, 2001, 2011). Ultimately the analysis aims to refine and expand understanding of dynamic capabilities theory (Teece et al., 1997: Eisenhardt and Martin,

2000; Bareto, 2010) by offering an approach to the development of its underlying microfoundations (Felin and Foss, 2005, 2009; Abell et al., 2008).

1.3 Background to this Research

This study is based on a large database of employee responses drawn from the National Workplace Survey of Employees conducted in 2009. In her capacity as Director of the National Centre for Partnership and Performance (NCPP), the researcher was centrally involved in overseeing the development and design of this national survey[1]. Permission was sought and granted from Government for funding to commission and conduct a series of national workplace surveys in Ireland. The purpose was to begin to gather information on working conditions in Ireland, similar to that provided by the WERS (Workplace and Employment Relations Survey) database in Britain. The second in the series of surveys was published in 2009 in two volumes, *The National Workplace Survey of Employers (2009) and The National Workplace Survey of Employees (2009).* As a result of the researcher's interest in surveying levels of innovation in Irish workplaces, for the first time the 2009 surveys capture data on innovation in Irish workplaces from the perspectives of employers and significantly also from the perspectives of employees. While much of the literature assumes a causal link between innovation strategies and desired organisational outcomes through influencing employees, ironically the reactions of employees has been neglected in research (Macky and Boxall, 2007; Taylor and McAdam, 2004; Harney, 2009). Conducting the surveys was part of a broader strategy to provide for a greater balance between science and technological innovation (STI) and experience-based innovation which is the creation of new knowledge in organisations and firms through the DUI mode of innovation, doing, using and interacting (Lundvall, 1998; Jensen et al., 2007). The surveys were designed to capture levels of innovation in Irish organisations and workplaces and to develop a database which would provide the basis for greater understanding, analysis and development of organisational innovation. Using this large database of employee responses (n = 5110), this study seeks to analyse and understand the dynamics of innovation within organisations.

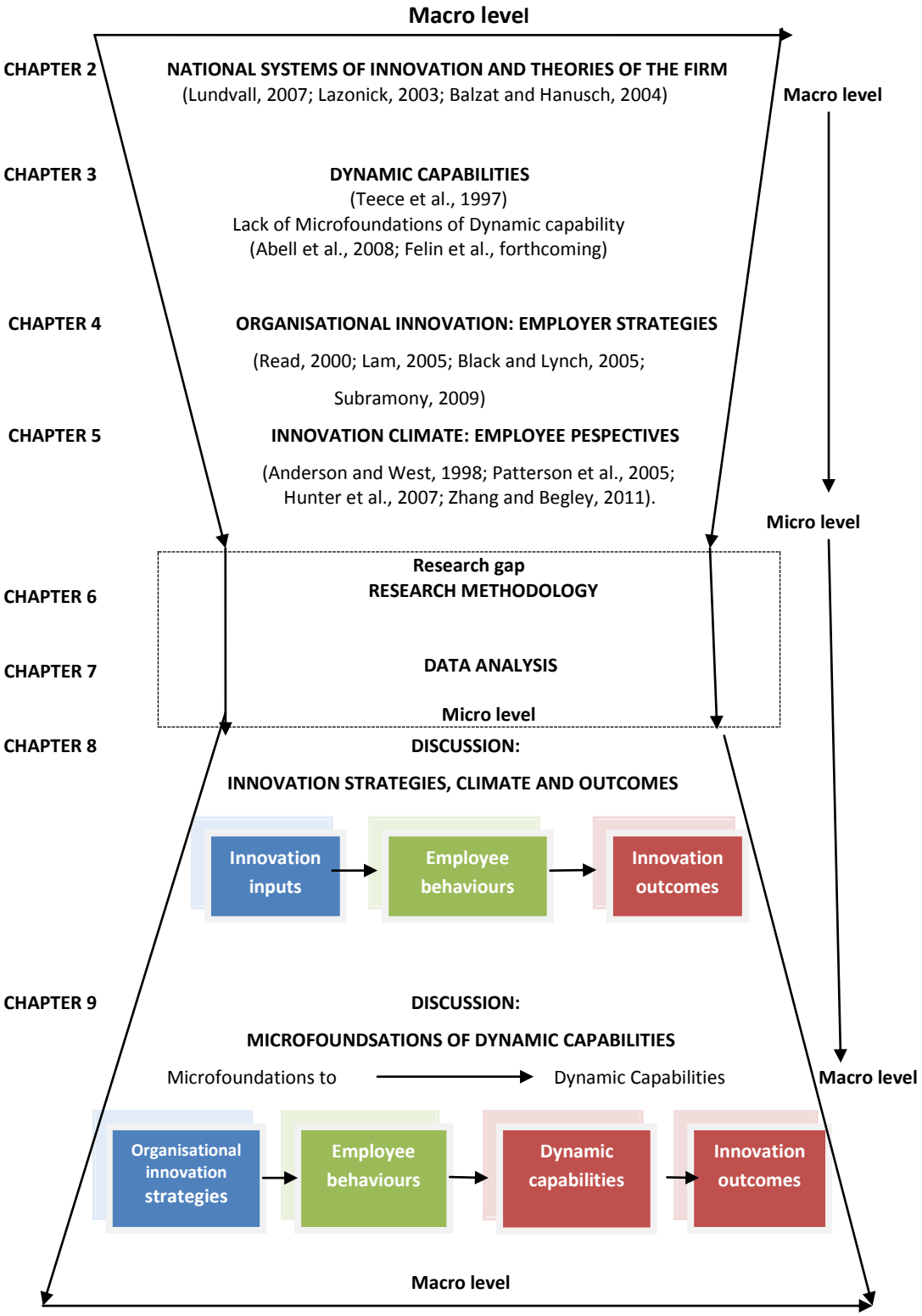
[1] In her capacity as Director of the NCPP from 2001- 2010, the author was involved in overseeing the design and development of the National Workplace Surveys 2009. The aim of the surveys was to assess levels of innovative capacity in workplaces in Ireland. Following detailed discussions with stakeholders and a tendering process, the Economic and Social Research Institute (ESRI) was commissioned to undertake the surveys. In the absence of national surveys similar to the WERS in Britain, the survey is unique in its scope and focus (See chapter 6, Methodology for further discussion).

The literature reviewed in this study progresses from macro literature on National Systems of Innovation (NSI), through dynamic capabilities and their deficiencies to focus on the importance of employee insights and employee perceptions of organisational innovation strategies. Following this lead the empirical investigation aims to elucidate the microfoundations of dynamic capability for innovation. It seeks to investigate the individual processes, interactions and behaviours at micro-level which collectively create the routines and activities that underpin dynamic innovation capability (Abell et al., 2008; Gavetti, 2005; Felin and Foss, 2005, 2009). Linking dynamic capability theory with human resource management and based on a review of the associated literatures, the study has identified organisational innovation strategies and innovation climate as important areas of investigation in the exploration of key influences on employee innovation behaviour (Amabile, 1993; Ford, 1996; Mumford 2000; Takeuchi et al., 2009). The study investigates the internal organisational processes and arrangements which facilitate innovation and explores the associations between particular organisational and management practices and innovation outcomes. Specifically, it investigates the links between organisational innovation strategies, innovation climate and behaviours, and innovation outcomes as the foundation for the development of the microfoundations of dynamic capability. The organisational innovation strategies investigated include empowerment-enhancing strategies such as communication and consultation; relational capital in the form of fostering positive relationships between management and staff and between staff members; and access to training. Outcomes in the investigation include organisational outcomes such as the introduction of new products and services and new workplace innovation processes coupled with employee outcomes in the form of commitment, job satisfaction and wellbeing. While the published survey reports examined descriptive statistics and general associations they did not explore relevant theoretical explanations or conduct in-depth analysis along the lines proposed here. This thesis therefore represents a unique opportunity to examine this large dataset in order to better understand the internal dynamics of innovation from the perspectives of employees.

1.4 Thesis Structure and Chapter Outline

An overview of the research and chapter outlines is presented diagrammatically in Figure 1.1. This captures how the thesis progresses from the macro exploration of national systems of innovation in chapter 2, to address the deficiencies of this approach by examining firm level dynamic capabilities in chapter 3. Chapter 4 explores employer strategies for organisational innovation before chapter 5 moves towards the micro level by examining the much neglected, but critically important, perceptions of employees. Drawing on this progression, the methodology chapter presents the model and related hypotheses which were used to interrogate the data as presented in chapter 7. The discussion of the findings and their implications is outlined in chapter 8, while chapter 9 proposes a model for the development of the microfoundations of dynamic capabilities for innovation based on the evidence from the study investigation. The narrative then returns to the macro level in chapter 10 by examining the implications for dynamic capabilities theory and practice and outlining the theoretical and methodological contributions of this study. A more in-depth outline of the chapters is presented overleaf.

Figure 1.1: Overview of the Research and Chapter Outline



Chapter Two explores the national systems of innovation (NSI) literature which in recent studies increasingly positions firms at the core of the innovation system (Nelson and Rosenberg 1993; Edquist, 1997; Lazonick, 2003; Lundvall, 1998, 2007; Balzat and Hanusch, 2004). It examines a number of economic theories of the firm and the role of innovative enterprises in market economies in order to understand the dynamics of innovation in enterprises. The theory of the firm as a dynamic entity is very significant in the study and understanding of innovation. Following a review of economic theories of the firm, this chapter identifies dynamic capabilities as an important theoretical framework for the study of innovation in organisations.

Chapter Three reviews dynamic capabilities literature (Teece et al., 1997; Eisenhardt and Martin, 2000; Helfat and Peteraf, 2009) in order to understand and conceptualise organisational change and innovation processes. Dynamic capabilities theory provides the scaffolding that can help explain how to develop and foster organisational innovation capabilities (Thompson, 2007, p. 1300). However, while dominant and widely accepted, the dynamic capabilities framework also has deficiencies (Priem and Butler, 2001; Abell et al., 2008; Barreto, 2010. The chapter examines the contested nature of the theory itself and limitations in its application. In particular the chapter focuses on the lack of explication of microfoundations of dynamic capabilities (Felin and Foss, 2005, 2009; Abell et al., 2008; Eisenhardt et al., 2010; Felin et al., forthcoming). This echoes the view of Abell and colleagues who state that '*there are no mechanisms that work solely on a macro-level, directly connecting routines and capabilities to firm-level outcomes'* (Abell et al., 2008, p. 489). In seeking to address this issue, the chapter aims to disaggregate dynamic capabilities in order to extrapolate the underlying processes and practices which may provide potential foundations for developing dynamic capability. The chapter concludes by proposing to fill gaps in microfoundations by supplementing the theory of dynamic capabilities with theories from organisational innovation and human resource management.

Chapter Four draws on the human resource management literature to address the gaps which have emerged in the dynamic capabilities framework and to better understand how to purposefully modify the human resource base (Helfat and Peteraf, 2009). This chapter explores the literature concerned with the link between human resource management (HRM) practices and organisational innovation (Hage 1999; Read 2000; Shipton et al., 2006). It draws on organisational innovation studies to offer insights into how organisations can develop the culture and practices which enable them to change routines and develop

the learning environments in which innovation thrives. Considering the domain of employer interventions, the chapter is able to draw on evidence from the National Employer Survey (NCPP, 2009), which supports the link between particular bundles of organisational innovation strategies and innovation outcomes. In developing microfoundations, the chapter examines the convergence between the underlying processes of dynamic capabilities and organisational innovation strategies. The similarity in the elements of the dynamic capabilities and organisational innovation literatures can be viewed as an important starting point in linking macro-level capabilities with micro-level organisational foundations and in filling the void identified by Abell and his colleagues (2008). Finally, the chapter explores the black box (Becker and Gerhart, 1996; Takeuchi et al., 2007; Guest, 2001, 2011), the HR-performance link debate and its relevance in overcoming the difficulties in linking organisational innovation strategies to outcomes.

Chapter Five contrasts with previous chapters which focus on management and employers' strategies for innovation as it brings employee perspectives firmly into focus. Examining the role of individual employees illustrates the challenge of creativity and how creative thinking and behaviour are difficult to orchestrate in organisations. It also raises the issue of distinguishing between creativity and innovation. The chapter explores how innovation climate, which reflects employees' perceptions and feelings, can lead to a better and more authentic understanding of why and how particular organisational innovation strategies lead to better innovation outcomes. It reviews literature on innovation climate in seeking to identify the key dimensions of a climate for innovation and explores recent studies on climate as a mediator through which HR systems influence employee perceptions and behaviours (Takeuchi et al., 2009; Mossholder et al., 2011). The chapter then considers how the integration of literatures on organisational innovation, innovation climate and dynamic capabilities begin to create a better understanding of the underpinning microfoundations of dynamic capabilities. This understanding directly informs the research model which is explicitly articulated in the methodology chapter.

Chapter Six explores the philosophical basis of the research methodology used in this study. It describes the suitability of the positivist philosophical approach which provides support for survey-based research. It explores the methods of research which have been adopted in previous studies of organisational innovation. The chapter then describes the research model and identifies key hypotheses coupled with documenting the research process and design. The chapter concludes by evaluating the approach taken.

Chapter Seven outlines the analysis of the data based on the research model. Bivariate analysis was conducted to investigate the correlation between innovation strategies, innovation climate and innovation outcomes. Following the correlation analysis, regression analysis was undertaken for organisational innovation outcomes and employee outcomes. Finally, to test the mediating role of innovation climate in the relationship between organisational innovation strategies and innovation outcomes, a mediation test was conducted following the four conditions described by Baron and Kenny (1986) and subsequently the Sobel test was used to assess the reliability of the model (Sobel, 1982). The results of binary and hierarchical linear regression analyses are presented. The research model is supported and most, but not all of the hypotheses are also supported.

Chapter Eight brings together the empirical evidence from this study and reviews its relevance in the context of previous studies and established theory particularly that discussed in the earlier literature review (Chapters 2, 3, 4 and 5). It considers the implications of the findings from two overarching perspectives; understanding the causal link between strategies and outcomes while also addressing the black box problem in HR and the development of organisational innovation capability. Key issues arising from this analysis are the centrality of innovation climate in developing innovation capability and the chapter's contradictory findings relating to wellbeing and training.

Chapter Nine drawing on the previous discussion, outlines a developmental approach to building dynamic capabilities and develops an integrated model which synthesises the framework for building dynamic capability from microfoundations to macro level strategic higher order capabilities. It explains how the model clarifies some of the confusion surrounding the nature and essence of dynamic capabilities. It also describes how the role of employees is crucial in building dynamic capabilities as is expertise in strategic human resource management in order to continuously '*reconfigure and refresh'* (Ambrosini and Bowman, 2009, p. 29) the human resource base.

Chapter Ten provides a conclusion. It reiterates the research aims and significance, the research journey, and outlines the main contributions of this research. It also addresses the research limitations and charts the potential for future research in this area.

Chapter Two: National Systems of Innovation and Theories of the Firm

2.1 Introduction

The overarching aim of this study is to investigate the dynamics of innovation in organisations and to identify the key internal organisational strategies and practices which facilitate innovation behaviours and lead to increased innovation outcomes. Within this context a central concern is to situate organisational-level innovation more firmly in national innovation policy. Innovation policy in Ireland has been predominantly concerned with supporting formal research and development processes or science and technological innovation (STI) (Lorenz and Valeryre, 2005; Hilliard and Green, 2005; Jordan and O'Leary, 2007; Lin et al., 2010). Little attention has been given to more *experience-based* or DUI modes of innovation, *doing*, *using* and *interacting* (Jenson et al., 2007) which occur in firms and organisations.[2] Because innovation is embedded in the organisational system that produces it, this mode of innovation is often described as organizational innovation (Van de Ven et al., 1999; Armbruster et al., 2008; Cavagnou, 2011). The need to recognise and support organisational innovation is part of a movement towards a broader, more holistic approach to innovation policy which acknowledges innovation that arises from a wider range of sources. It is also more reflective of the influential Schumpeterian approach to innovation which involves new products, new production methods, new markets, new sources of supply and new forms of organisation (Schumpeter, 1934; Armbuster et al., 2008). More recently, these broader multi-disciplinary innovation approaches are incorporated in the conceptual model of a *national system of innovation*, NSI (Freeman, 1995, 2001, 2002; Nelson, 1993; Edquist, 1997; Edquist and Hommon, 1999; Lazonick, 2003; Lundvall, 1998, 2007; Balzat and Hanusch, 2004; Groenwegan and Van der Steen, 2006).

This chapter explores how innovation in firms is situated in the NSI conceptual model in order to underscore its importance in national innovation policy. Secondly, in seeking to understand the dynamics of innovation inside enterprises, the chapter examines a number of economic theories of the firm and the role of innovative enterprises in market

[2] See for example recent strategies on innovation policy such as the Strategy for Science, Technology and Innovation 2006-2013 and the Report of the Innovation Task Force 2010 where organisational-level innovation is not afforded a specific role.

economies. The exploration of economic theories of the firm is aimed at understanding the theory of the innovative enterprise (Lazonick, 2003) and positioning the examination of the dynamics of innovation within enterprises and organisations in robust theoretic foundations. The chapter considers the role accorded to the innovative firm in the neo-classical economic tradition. It then explores briefly other theories of the firm which have relevance to the subject of innovation as they are concerned with the internal workings of the firm and to greater and lesser degrees all see the firm as a dynamic and proactive entity.

2.2 National System of Innovation (NSI)

The identification of the need for a broader approach to innovation policy, and the centrality of enterprise-level innovation, has been greatly facilitated by the development and diffusion of the concept of NSI. While it has long been used by the academic community, (Dosi, 1988; Freeman 1995, 2002; Lundvall, 1992, 2007; Nelson, 1993; Edquist, 1997; Balzat and Hanusch, 2004), it is now being applied by policymakers across the globe as a means of developing national innovation strategies and improving the organisation of innovation activities and supports at national level (Lundvall, 2007; Ramstad, 2009). It is also used by international organisations as a benchmarking tool and an analytical framework (Balzat and Hanusch, 2004).

The core idea in the concept of the national system of innovation is that patterns of innovation and technological change are different in each country and that this difference can be traced back to national institutional frameworks, organisational forms and aspects of national learning and culture which either enable or inhibit innovation and the development of innovative competencies (Lundvall, 2007). A national innovation system can therefore be defined broadly as *'a historically grown subsystem of the national economy in which various organisations and institutions interact with and influence one another in the carrying out of innovative activity'* (Balzat and Hanusch, 2004, p. 197).

As a means of developing national strategy and measuring innovation performance, different descriptive models of a national innovation system have been developed and these models vary in the degree of importance afforded to firm-level innovation in the system. For example, Groenewegen and Van der Steen (2006) outline a hierarchical model which draws a distinction between macro and micro levels in the innovation system. The model consists of five layers in which organisations, firms and individual actors within these

institutions are represented in layers four and five at micro level while the political, social and cultural ecosystem in which firms operate are represented in layers one to three at the macro or top level of the hierarchy. Lundvall (2007) is more strident than Groenewegen and Van der Steen in acknowledging the central role of firms in the national system of innovation. For Lundvall, the core of the system is the firm or organisation interconnecting and building relationships with other firms, and the wider context or ecosystem of innovation includes education systems, labour markets, social welfare arrangements, patent arrangements and intellectual property rights and the overarching regulatory and standard-setting regime. Increasingly firms are therefore seen as the units that play the most important role in the innovation system and their innovative performance is linked to how they organise themselves (Lazonick, 2003). This approach accords with models of innovation which situate firms at the heart of the system where innovation is seen as an interactive process in which firms interact with customers and suppliers and with knowledge institutions (Freeman, 1995: Nelson and Rosenberg, 1993; Teece et al., 1994, 1997; Chang and Chen, 2004; Teece, 2007). Lundvall captures this approach as follows; *'The core of the innovation system is firms, in interaction with other firms and with the knowledge infrastructure'* (Lundvall, 2007, p.102).

If innovation performance at the level of the firm is of central importance to the development of a successful national system of innovation, then it is imperative that the internal dynamics or the *micro-behaviours* (Lundvall, 2007, p. 95) that support innovation in organisational settings are investigated and understood. It matters for economic performance how firms organise themselves (Lazonick, 2003; Lundvall, 2007). The remainder of this chapter explores a number of economic theories of the firm in order to identify a conceptual framework for understanding innovation processes within enterprises and situating the dynamics of innovation in strong theoretical foundations.

At the outset, it must be acknowledged that the theory of individual firm performance and in particular innovation performance traditionally has been much neglected by economists and is given scant attention in mainstream economic theories. Acknowledging this neglect, Nelson explains that '*the tendency to ignore discretionary firm differences in part reflects the fact that economists are not interested in behaviour and performance at the level of firms, but rather in broader aggregates – industry or economy wide performance'* (Nelson, 1991, p. 62).

2.3 Innovation and Theories of the Firm

The neo-classical theory of the firm views organisations as relatively static, their primary function and contribution being to serve and respond to market forces. The theory is grounded in the underlying assumption of rational optimising behaviour and perfect knowledge (Lazonick, 2003). However, the assumption of the availability of perfect knowledge runs counter to the unpredictability of the innovation process which operates in conditions of uncertainty (Read, 2000; Bessant, 2007; Skarzynski and Gibson, 2008). Because innovation is an iterative process often involving the user, and because innovation is a process where all alternative outcomes cannot be known in advance, Lundvall concludes that, on reflection, innovation '*could not thrive in an economy with 'pure markets' characterised by arm's length relationships between the producer and the potential user'* (Lundvall, 2007, p. 107).

In seeking to understand the economics of supply and demand, neo-classical economists developed a concept of the allocation of resources as *reversible, individual* and *optimal* (O'Sullivan, 2000). Economists of innovation challenge these concepts of resource allocation and counter that resources are allocated through a process that is developmental, organisational and strategic (O'Sullivan, 2000). Developmental allocation of resources requires that resources are committed to irreversible investments with uncertain returns; organisational means that return are generated through the integration of human and physical resources; and strategic means that resources are allocated to overcome market and technological conditions that other firms take for granted.

Because neo-classical theory views organisations as relatively static, it is of little help in understanding innovation because it cannot explain the utilization of productive resources nor how innovation occurs in enterprises (Lazonick and O'Sullivan, 1995; Best, 1990; Lazonick, 2003). It is necessary therefore to explore other theories of the firm that have relevance to the subject of innovation.

Transaction cost economics and behavioural theory in contrast to neo-classical economics accord an important role for the firm and its internal organisational arrangements in the process of economic development, albeit for different reasons. While the minimisation of transaction costs is the basis for the existence of firms in transaction cost theory (Coase, 1992), the theory does encompass the self-determining element of the firm in having the capacity to proactively adapt to its external environment and chart its own success in a way Williamson describes as '*intertemporal, adaptive, managerial exercise'* (Williamson, 1998, p. 33). However, critics of this theory argue that it does not sufficiently take into account the role of the firm in acquiring and developing knowledge while Lazonick argues that transaction cost theory is a theory of an adaptive firm rather than an innovative one (Lazonick, 2003).

Similarly, elements of the behavioural theory of the firm such as bounded rationality, imperfect environmental matching and unresolved conflict (Cyert and March, 1963/1992) all have relevance in the innovation process. Most importantly however, behavioural theory began to develop concepts such as organisational slack, organisational learning, adaptiveness and the role of rules and routines (Aungier and Teece, 2006) and these concepts are central to later dynamic theories of the firm. However, concerning learning and innovation, the theory has a rather narrow and reactive focus promoting problemistic search in which search can be induced by problems and by extension, the more problems the firm has the more likely it is to innovate (Pitelis, 2007).

2.4 Theories of the Firm as a Dynamic Entity

Schumpeter's theory of '*creative destruction'* (Schumpeter, 1934) represents a significant breakthrough in understanding the firm as a dynamic entity and in itself an important player and influencer of the market and market conditions. Schumpeter's theory is an important conceptual framework for understanding innovation and the role of innovation in competitive markets. The essential point is that '*in dealing with capitalism, we are dealing with an evolutionary process'* (Schumpeter, 2005, p. 82). The theory of innovation advanced by Schumpeter is the theory of creative destruction which is a process of incessant creation, mutation, replacement and destruction. It is a process of continuous change and innovation from within, incessantly destroying the old, and continually creating the new (Schumpeter, 1934).

Edith Penrose's seminal book *The Theory of the Growth of the Firm,* first published in 1959, can also be seen as an important contribution to the development of the role the firm as a dynamic player and to the emergence of evolutionary economic theory (Penrose, 1995). In a departure from the neo-classical tradition of the time, she advances the theory that it is the services that are generated from the internal resources of the firm that enable it to achieve competitive advantage and these resources are both physical and human. In exploring the internal dynamics of innovation, Penrose develops the theory of innovation as slack-enabled innovation and explains the theory as follows: '*unused productive services are, for the enterprising at the same time a challenge to innovate, an incentive to expand, and a source of competitive advantage. They facilitate the introduction of new combinations or resources- innovation- within the firm'* (Penrose, 1995 (1959), p. 85-86). Excess slack and resources not only enable innovation but motivate it. Given that the firm and its management are in pursuit of maximum profit, because of the availability of excess resources they are incentivised to put these recourses to profitable use at low marginal cost.

Evolutionary economists such as Nelson (1991) and Chandler (1992) go further in opening up the internal organisational dynamics of the firm as an issue of central importance. They argue that it is the evolutionary theory of the firm**,** with its emphasis on organisational capabilities and continuous learning that explains the growth of firms in the modern industrial era. Nelson (1991) focuses on the organisation's ability to gain from innovation that accounts for organisational differences and therefore the sources of competitive advantage:

'*I want to put forward the argument that it is organisational differences, especially differences in ability to generate and gain from innovation rather than differences in command over particular technologies, that are the sources of durable, not easily imitable, differences among firms'* (Nelson, 1991, p. 72).

In acknowledging the importance of organisational capabilities, similar to Schumpeter and Penrose, Nelson sees firms as bundles of resources and the theory focuses on the firm's organisational capabilities and resources (Nelson, 1991). Chandler (1992) also puts the development of organisational and dynamic capabilities centre stage in explaining firm success and explores the role of routines and resources in building such capabilities. In this way he was laying the groundwork for what was to follow from Teece (1994, 1997), Dosi

(2000) and Lazonick (2003). Similar to Nelson (1991), Chandler believes that there is a hierarchy of routines in putting together the key building blocks of core organisational capabilities from simple and repetitive learned routines, to more complex co-ordination routines and finally to strategic higher-order activities (Chandler, 1992). This arrangement of routines into a hierarchy provides an important foundation for understanding the foundational building blocks of higher–order strategic capabilities.

The evolutionary theory while it comes close, however, for some does not accommodate all the elements of the innovative firm in a modern economy. For example, O 'Sullivan (2000), argues that it does not elaborate on organisational integration which is a set of relations that creates incentives for people to apply their skills and efforts to the innovation process (O'Sullivan, 2000; Lazonick and O'Sullivan, 1995). Essentially, while evolutionary economics advocate the importance of the internal factors which lead to firm success and innovation performance, these internal factors have not received much attention either theoretically or empirically in evolutionary economic studies. As Laursen and Foss note '*much of the work has had an aggregate focus in which the internal organisation of the firm has received less attention and where the main interest has centred on issues such as appropriability, firm size, market structure, complementary assets, etc. as determinants of innovation*' (Laursen and Foss, 2003, p. 245).

2.5 Resource Based View (RBV)

Theorists of the resource-based view of the firm (RBV) are broadly on the same side (Ambosini and Bowman, 2009) as evolutionary economic theorists and theorists of the innovative enterprise in that they accord significance to the primary role of the firm in generating economic success for a region or state. Exploring internal organisational dynamics as a source of competitive advantage, the core principle is that an organisation can be regarded as a bundle of resources and that resources that are valuable, rare, inimitable and non-substitutable (VRIN) (Barney, 1991) are the firm's main source of competitive advantage. A firm's resources at a given time could be defined as: '*those (tangible and intangible) assets which are tied semi permanently to the firm*' (Wernerfelt, 1884 p. 172).

The RBV opens up many layers of enquiry into how firms might identify, build and acquire resources in pursuit of particular streams of innovation and how these can, over time, be developed to become valuable, rare inimitable and nonsubstitutable , thus sustaining the firm's advantage. However, the theory is silent on how to interact with these resources and does not elaborate on how they are to be configured and managed to best advantage. Summarising these concerns and criticisms of the resource-based view over the past two decades, Kraaijenbrick et al., (2010), argue that '*the definition of resource is unworkable*, *the RBV has no managerial implications and … the value of a resource is too indeterminate to provide for useful theory'* (Kraaijenbrick et al., 2010, p. 351).

Echoing other authors, (e.g. Bowman and Ambrosini, 2003), Kraaijenbrick and colleagues point to the broad and rather static concept of resources which is inherent in the resource-based theory. The definition of resources is all embracing and inclusive; '*by a resource is meant anything which could be thought of as a strength or weakness of a given firm*' (Wernerfelt, 1984; p. 172). Others argue that the RBV does not sufficiently distinguish between the resources that the firm possesses and the managerial and organisational capabilities that enable the firm to utilise, exploit and deploy these resources. This has led to the criticism that the RBV is essentially a static view of the firm (Ambrosini and Bowman, 2008, 2009). The method of transforming and leveraging resources presents considerable challenges which are not sufficiently addressed in the RBV (Wernerfelt, 1984, 1994). There is a layer of strategic interaction with these resources which is missing and importantly as Wang and Ahmed observe '*the theory fails to address the influence of market dynamism and firm evolution overtime*' (2007, p. 33). It is this dynamic interaction with markets and resources that is at the core of dynamic capabilities theory which is now explored.

2.6 Dynamic Capabilities Theory

Dynamic capability theory is very significant in the study of innovation and it represents a significant development of the theories of the firm which have been outlined heretofore. The theory was originally developed by Teece and his colleagues (Teece and Pisano, 1994: Teece et al., 1997) to explain how firms develop responses to rapidly changing environments although more recently some authors contend that it can be applied more widely (Eisenhardt and Martin, 2000; Ambrosini et al., 2009). Dynamic capabilities are '*the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments'* (Teece et al., 1997, p. 516.) For Teece there was an inherent tension between the neo-classical static view of the firm and emerging theories

of management and what he called '*the cavalier treatment of know-how'*, and the behavioural assumptions around rationality (Aungier and Teece, 2006, p. 400). While the theory is based on the resource-based view of the firm, its key influences also include Schumpeter (1934), Penrose (1959), Nelson and Winter (1982) and Prahalad and Hamil (1990) all of whom agree that competitive strategy depends in large measure on honing internal technological, organisational and managerial processes inside the firm. However, the RBV did not sufficiently explain how a firm develops the capabilities and the necessary agility to respond to fast-moving and increasingly global markets (Ambrosini and Bowman, 2009). The theory of dynamic capabilities is also an extension of the evolutionary theory of economic change (Nelson and Winter, 1982; Best, 1990; Best et al., 2000) the knowledge-based view of the firm (Nonaka, 1994; Kogut and Zander 1992 and 1995; Grant, 1996) and the Penrosian theory of the growth of the firm where learning and innovation are central (Penrose, 1959).

Dynamic capability is a theory of the firm which sees the firm not as a passive institution endeavouring to reach equilibrium in a fluctuating marketplace; not as merely capable of adapting to market conditions as in transaction cost theory; and not as responding to '*productive opportunity*' and '*organisational slack'* (Penrose, 1995, p. 31); rather as a player, shaping and influencing the market in which it operates (Best 1990; Lazonick, 1995, 2003, 2008; O'Sullivan, 2000; Teece et al., 1994, 1997). Addressing Kraaijenbrick et al.'s (2010) critique of the RBV and the requirement for superior and strategic management capability, the theory privileges management (Thompson, 2007). It highlights the importance of management capabilities in interacting purposefully (Helfat and Peteraf, 2009) with the resource base and developing difficult to imitate combinations of organisational, functional and technological skills (Teece and Pisano, 1994; Teece, Pisano and Shuen, 1997). Ambrosini and Bowman (2009) explain the difference between the RBV and dynamic capabilities as follows: *'the dynamic capability perspective extends the resource-based view argument by addressing how valuable, rare, difficult to imitate and imperfectly substitutable resources can be created, and how the current stock of valuable resources can be refreshed in changing environments'* (p. 29).

Thus, the theory of dynamic capability brings the debate on the role of the firm full circle, from the static role afforded to it by traditional neo-classical economists as suggested at the outset of this chapter. Dynamic capability is an important conceptual framework for the study of innovation because it explores the capability to create new resources and to refresh and reconfigure existing resources in responding to changing market conditions and even creating new markets (Ambrosini and Bowman, 2009). Addressing capabilities for future resource creation makes dynamic capabilities an important framework for exploring innovation. However, as illustrated in the next chapter, it is not without limitations.

2.7 Summary

In seeking to situate organisational-level innovation more firmly in national innovation policy, this chapter explores the conceptual model of national systems of innovation (NSI) which increasingly sees firms at the core of the innovation system. The innovation performance of firms is important for wider economic development, and it matters how they organise themselves (Lazonick, 2003; Lazonick and Prencipe, 2005; Lundvall, 2007). The chapter therefore explores theories which are concerned with the internal dynamics of the firm and to greater and lesser degrees see the firm as a dynamic and proactive entity. From this review, the study identifies dynamic capability as an important conceptual framework for the study of organisational-level innovation. The dynamic capability view (DCV) focuses attention on the firm's ability to renew and refresh its resources in line with, and at times shaping the external environment (Ambrosini and Bowman, 2008), capabilities which are central to innovation. The degree to which the dynamic capabilities framework offers explanations as to how this is achieved will be explored in the next chapter.

Chapter Three: Dynamic Capabilities

3.1 Introduction

The emergence of the theory of dynamic capabilities in the early 1990's (Teece and Pisano, 1994; Teece, Pisano and Shuen, 1997) can be viewed as a considerable breakthrough in the development of the theory of the firm and in conceptualising the internal dynamics of innovation in organisations. This chapter outlines why dynamic capabilities provide an important theoretical framework for the study of innovation. It explores the extent to which the theory has fulfilled its original promise to illuminate the internal organisational systems and processes which enable firms to innovate and to develop responses to rapidly changing environments. In this regard it examines the contested nature of the theory itself and limitations in its application (Priem and Butler, 2001; Cepeda and Vera, 2007; Ambrosini and Bowman, 2009; Helfat and Peteraf, 2009; Barreto, 2010). It explores the literature on the lack of explication of microfoundations (Felin and Foss, 2005, 2009; Abell et al., 2008; Eisenhardt et al., 2010; Felin et al., forthcoming). In seeking to address this issue, the chapter concludes by disaggregating dynamic capabilities in order to extrapolate the underlying processes and practices which may provide potential foundations for developing dynamic capability.

3.2 Dynamic Capabilities as a Conceptual Framework for Innovation

As a theoretical framework, dynamic capabilities is a synthesis of concepts and disciplines from strategic management, business history, industrial economics and organisational science, but it is in the area of innovation studies that it perhaps offers most potential (Zollo and Winter, 2002). In relation to innovation, the theory addresses the processes of future resource-creation. It concentrates on how to create new resources and to renew and alter existing resources both in responding to changes in the environment and often changing that environment by creating new markets (Bowman and Ambrosini, 2003). Because it deals with the mechanisms of organisational change and renewal and the strategic managerial capabilities required to orchestrate such change, it mirrors organisational innovation which is underpinned by learning, knowledge management and the knowledge-based view of the firm (Kogut and Zander, 1995; Easterby–Smith et al., 2009). The link between dynamic capabilities, innovation and knowledge management is succinctly captured by Nonaka and Takeuchi (1995) when they describe innovative companies as companies that create new knowledge to solve problems and generate solutions and

significantly in the process recreate the environment in which they operate. Dynamic capabilities are therefore a key element in creating an innovative enterprise as they embody the organisational innovation and knowledge management capabilities which enable the organisation to not only respond to market conditions but also to develop new markets.

In examining the relevance of the theory to organisational innovation, the original definition offered by Teece and his colleagues affords some important insights. The original definition is broad and all-encompassing defining dynamic capabilities as '*the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments'* (Teece et al., 1997, p. 516). This definition is built around a number of main elements that emphasise its theoretical underpinnings and its relevance to innovation. Firstly, this approach emphasises the central importance of strategic management. The definition implies that the dynamic capabilities perspective privileges the role of strategic managerial capabilities (Thompson, 2007). Secondly, it states that the desired outcome is to build and reconfigure internal and external competences. In this, the authors assume an evolutionary economics perspective highlighting the roles of routines, path dependencies and organisational learning (Bareto, 2010). Thirdly, the perspective focuses on particular external environments, i.e. rapidly changing environments. Fourthly, the definition assumes that these capabilities are '*home grown'* (Helfat and Winter, 2011, p. 1244) as they are built rather than bought. Fifthly, similar to the RBV these capabilities are heterogeneous because they are embedded in the firm and are unique and path dependent. Finally, the authors specify that the possession of such capabilities will lead to sustained competitive advantage. This original definition therefore aligns theoretically many of the underpinning strategic conditions which form the basis of innovation and sustained competitive advantage in fast-moving environments, conditions which proved elusive in previous theories of the firm as outlined in the previous chapter.

Exploring the definition further, for Teece and his colleagues*, dynamic* refers to the capacity to renew competencies so as to achieve congruence with a rapidly changing business environment. The core underlying principle is the capability to interact with the resource base of the firm so as to reconfigure and refresh existing resources and create new ones (Ambrosini and Bowman, 2009, p. 29). The capability to create new resources and to refresh and reconfigure existing resources is a key element in creating an innovative enterprise and fundamental to understanding innovation. Dynamic resource configuration

and the capacity to renew and refresh the resource-base is also a central theme in Eisenhardt and Martin's definition of dynamic capabilities as *'the organisational and strategic routines by which the firm achieves new resource configurations as markets emerge, collide, split, evolve and die'* (Eisenhardt and Martin, 2000, p. 1107). These capabilities therefore enable the organisation to '*reflexively revisit*' what it does in changing environments (Felin and Foss, 2009, p. 161).

Capabilities emphasise the key role of strategic management in appropriately adapting, integrating, and reconfiguring internal and external resources such as organisational skills and functional competences to match the requirement of the changing environment. In defining capabilities, Dosi et al., (2000) distinguish between capabilities and routines and describe a capability as follows: 'a *fairly large scale unit of analysis, one that has a recognisable purpose expressed in terms of the significant outcome it is supposed to enable, and that is significantly shaped by conscious decision both in its development and deployment*' (Dosi et al., 2000 p. 4). Helfat and Winter (2011) note the purpose and performance elements of a capability but emphasise that capability is that which '*enables a repeated and reliable performance*' (Helfat and Winter, 2011, p. 1244). Capabilities are therefore distinguishable from organisational routines by virtue of their scale and size, their strategic nature and the significance of their outcomes, their ability to enable repeated and consistent performance and by the element of conscious decision-making that is involved in their deployment. However, as will become clear later on in this chapter, in some of the literature and definitions of dynamic capabilities, these distinctions are not always understood or upheld.

3.2.1 Internal and External Integration

Integral to the dynamic capabilities framework is internal and external integration which is also significant for innovation (Teece et al., 1997; Iansiti and Clark, 1994). The framework is not one-sided or one-dimensional in its view of the interaction between the internal and external environments. The theory provides a bridge between those advocating the endogenous view, the RBV view (Barney, 1991; Wernerfelt, 1984, 1995) of the firm as the area of building competitive advantage and those who are concerned with the exogenous approach alone, areas such as the competitive forces framework (Porter, 1980, 1991, 1996; Hoskisson et al., 1999).

For Teece, in the development of dynamic capabilities, the innovative firm not only plays a critical role in determining its own future by reacting and responding to given market conditions, but through innovation the firm is in a position to influence and shape the environment or market place in which it operates. For Teece, the environment or ecosystem is not merely the industry in which the company operates and resides but the entire community of organisations, institutions and individuals that impact the enterprise and its customers and suppliers (Teece et al., 1994, 1997, 2007). This interaction with the ecosystem is redolent of the theory of national systems of innovation in which firms are situated at the core of the wider regional or national innovation system. In this system, they are involved in a process of interaction with other firms, customers, suppliers, wider knowledge institutions and wider networks of individuals and institutions such as policy-makers, regulators and educational and research institutions (Freeman, 1995; Nelson and Rosenberg, 1993; Lundvall, 2007; Lorenz and Lundvall, 2010).

However, the dynamic capabilities framework places the firm in a much more proactive role than that envisaged by the national system of innovation framework. The firm's innovative success lies not only in its capability to harness the potential of the ecosystem but to dynamically influence the ecosystem as Teece explains: '*They not only adapt to business ecosystems but also shape them through innovation and collaboration with enterprises, entities and institutions'* (Teece, 2007, p. 1319). The firm is capable of shaping and changing the dynamics of the market and the environment in which it operates. This is the kernel of Teece's critique of Porter's Five Forces framework (Porter, 1980). For Teece, the fundamental flaw in Porter's framework is that it views market structure as exogenous when in fact Teece sees market structure as endogenous and often the result of learning and innovation. Enterprises can search for new opportunities and developments in the marketplace, and then engage in innovation and developmental activities which if successful affect not only the success of the firm and its competitive positioning, but also the market structure.

3.2.2 Relevance to all Firms and Sectors

There is much debate in the literature on the application of the theory of dynamic capabilities and the question of its relevance to particular industries and firms. Teece et al., (1997) argue that dynamic capabilities are particularly relevant to global industries which are characterized by intense levels of competition and rapidly changing consumer demands. Helfat and Winter (2011) more recently contest this view and contend that

dynamic capabilities are not restricted to businesses that operate in fast-paced environments, nor are they limited to the context of radical change. They offer many examples of businesses such as Walmart and Starbucks which possess dynamic capabilities but operate in '*more gradual and relatively placid external environments*' (Helfat and Winter, 2011, p. 1249).

Eisenhardt and Martin's (2000) conceptualisation of dynamic capabilities as tools that manipulate resource configurations also allows for more flexibility in the application of the dynamic capabilities framework. These tools can be used to improve existing resource configurations to achieve longer term competitive advantage while in fast moving markets they can be utilised to build new resource configurations and to move into fresh competitive positions (Eisenhardt and Martin, 2000). Because dynamic capabilities have many commonalities (Eisenhardt and Martin, 2000; Ambrosini et al., 2009), they have relevance to many settings but can be applied differently. These common characteristics are present when they are understood as relating to specific organisational processes and core competencies. For example, when they relate to competency in product development, common features might include the presence of cross-functional teams, product development processes such as idea generation, brainstorming, extensive external communications and networking and other intensive knowledge creation processes (Eisenhardt and Martin, 2000, p. 1108). These commonalities open up opportunities for the theory of dynamic capabilities to be applied to many market and environmental settings and many organisational configurations.

Teece et al.'s framework of dynamic capability therefore provides an important zone of inquiry in which to conceptualise and understand the challenge of building creative and innovative capacity within enterprises and in framing the internal change processes which underpin innovation. These strategic internal capabilities highlight in particular, strategic management capability, internal and external integration capability, speed of response to changing market conditions and the ability to shape and influence the marketplace through innovation (Bareto, 2010). These capabilities are developed internally, and are therefore unique to the firm and difficult to imitate. The question therefore arises as to how these important strategic capabilities are built and developed and how the theory links the development of capabilities with organisational strategies which affect innovation behaviour and outcomes. The answers to these questions remain elusive for a number of

reasons but principally because of the contested nature of the framework itself which is the subject of the next section.

3.3 The Contested Nature and Deficiencies in the Dynamic Capability Framework

While increasingly dominant and widely accepted, the dynamic capabilities framework also has deficiencies (Priem and Butler, 2001; Abell et al., 2008; Barreto, 2010). There are a number of underlying tensions in the theory which continue to create challenges in its application. Among these are the confusion that surrounds the understanding of the nature and essence of dynamic capabilities, the proliferation of definitions and the elusive nature of the concept itself which cause difficulties with measurement and construction (Ambrosini and Bowman, 2009; Barreto, 2010).

3.3.1 The Elusive Nature of the Concept and Difficulties in Definition

The theory and nature of dynamic capabilities remains a much contested area. Hence the debate on dynamic capabilities has been predominantly focussed on defining the nature of dynamic capabilities and their effects and consequences (Easterby–Smith et al., 2009) and less on understanding the evolution and development of these high performing change capabilities. This difficulty is captured by Kraatz and Zajac who claim that '*while the concept of dynamic capabilities is appealing, it is rather a vague and elusive one which has thus far proven largely resistant to observation and measurement*' (2001, p. 653). This can be explained somewhat by the fact that emerging and evolving theories develop slowly over long periods of time and as a field of inquiry dynamic capabilities theory is still in its infancy. Empirical research in the area of dynamic capabilities is also limited and there is a need for deeper analysis on how and why managers use dynamic capabilities (Helfat and Peteraf, 2009).

The debate on the nature of dynamic capabilities centring on the vagueness of the underlying constructs has led to a lack of a precise definition. The original definition suggested by Teece et al. (1997) was so broad and all-encompassing that it was open to interpretation. As a result authors have interpreted dynamic capabilities differently depending on their different backgrounds. For example, Eisenhardt and Martin (2000) view dynamic capabilities as processes and changing routines**.** Attempting to simplify the understanding of dynamic capabilities, they suggest that they can best be understood

through the processes in which they are exercised. In this interpretation, routines are understood as behaviour that is learnt and repetitious but '*iterative and cognitively mindful, not linear and mindless'* (Eisenhardt and Martin, 2000, p. 1117). Zollo and Winter develop this concept of changing routines and collective behaviour further in the following definition 'a *dynamic capability is a learned and stable pattern of collective activity through which the organisation systematically generates and modifies its operating routines in pursuit of improved effectiveness'* (Zollo and Winter, 2002 p. 340). The consensus emerging from more recent attempts at a more definitive definition is that dynamic capabilities are '*the capacity of an organisation to purposefully create, extend and modify its resource base'* (Helfat et al., 2007, p. 94). The essence of the dynamic aspect of the capability is the ability to extend and modify (Helfat et al., 2007) or refresh and renew *(*Ambrosini and Bowman, 2009) the resource base. The contradiction inherent in these definitions is that for some they are routines and patterns that are repeatable, reflecting regular and predictable behavioural patterns (Zollo and Winter, 2002), while for others they are strategic higher-order change capabilities which reside in the potential to change routines and patterns (Prieto, Revilla and Rodriguez-Prado, 2009). The distinction between capabilities and routines (Dosi et al., 2000; Helfat and Winter, 2011), as outlined previously in this chapter, is blurred in these definitions.

3.3.2 Disagreement about the Value and Outcomes of Dynamic Capabilities

There is also contention around the value and outcomes for firms arising from the possession of dynamic capabilities. While Teece et al. (1997) argue forcibly that dynamic capabilities do lead to sustainable competitive advantage, Zollo and Winter (2002) contend that dynamic capabilities are deployed in pursuit of improved effectiveness. Eisenhardt and Martin (2000) take a different view and assert that they represent best practice. They argue that while they can be a source of competitive advantage, they cannot in themselves be a source of sustainable competitive advantage. Using the VRIN (Barney 1991) criteria for sustainable competitive advantage, Eisenhardt and Martin (2000) contend that while dynamic capabilities are rare and valuable, they are substitutable, imitable and mobile because they need to have key features in common to be effective. Ambrosini and Bowman (2009) also argue that competitive advantage may be only temporarily sustained because sustainable competitive advantage requires ownership of not only developmental capabilities and assets but capabilities that are unique and difficult to replicate. They may

even lead to failure if the resource base which is being reconfigured is irrelevant to the market place.

Summarising the unpredictability of the outcomes from the possession of dynamic capabilities, Ambrosini and Bowman (2009) point to four different outcomes resulting from the deployment of dynamic capabilities: they can lead to sustainable competitive advantage if the resulting resource base is not imitated for a long time; they can lead to temporary advantage as in hypercompetitive markets where advantage can only be transient; they can lead to competitive parity if they allow the firm to successfully compete in the industry without outperforming their rivals and they may even lead to failure if the resulting resource base is irrelevant to the market. In this analysis, it is evident that the key principles, definition and outcomes of the dynamic capabilities framework are still the subject of much debate and there are many variations and interpretations of Teece, et al.'s original definition and ideas.

3.3.3 Lack of Clarity on Strategic and Operational Elements of the Model

While dynamic capabilities were originally regarded as strategic, higher-order capabilities (Teece et al., 1997; Winter, 2003; Helfat and Peteraf, 2009) understanding how these capabilities develop is hampered by the confusion around language and the absence of an established hierarchy of processes. The need to distinguish between levels is evident in the summary of the dimensions of dynamic capabilities by Bareto (2010) where the author notes that dynamic capabilities can variously be described as abilities, capacities, processes and routines. This is further complicated by the fact that in fast moving environments and in periods of rapid organisational change, it is often difficult to sustain stable patterns of routines and processes (Corelli O' Connor, 2008). For Helfat and Winter (2011) however, drawing a line between dynamic and operational capabilities is '*unavoidably blurry*' (2011, p. 1243). This is because change is occurring at both levels and it is sometimes difficult to distinguish between levels supporting the change. Nonetheless, Winter (2003) does attempt to distinguish between dynamic and operational levels. To begin with, all firms must have capabilities in order to make a living and these basic capabilities can be described as zero-level capabilities. A firm operating 'in equilibrium' keeps earning a living by producing and selling products that make profits over time. These are underpinned by what Teece calls production routines (Augier and Teece, 2006). By contrast, the capabilities that a firm needs to change the product or to continuously change product

offerings over time are capabilities of a higher order or change capabilities or dynamic capabilities. These capabilities are underpinned by learning routines (Augier and Teece, 2006). These capabilities according to Teece enable firms to develop unique capabilities for *invention*, *discovery* and the *development of opportunities* in responding to challenging environmental circumstances (Teece, 2007, p. 1341). This distinction is helpful but how these strategic capabilities develop remains uncertain (Bareto, 2010; Felin et al., forthcoming).

Reflecting the need for clarity of definition and a clear hierarchy of processes and routines, a further layer of complexity arises in the notion of a hierarchy of dynamic capabilities themselves (Ambrosini et al., 2009). At the first level are *incremental dynamic capabilities* which are deployed to continually improve the firm's resource base, at the second level are *renewing dynamic capabilities* which refresh and reconfigure the resource base and at a higher level again are *regenerative dynamic capabilities* which in effect change and renew existing dynamic capabilities. This again raises the fundamental question of definition. If dynamic capability is the capability to refresh, renew and change the resource base (Ambrosini and Bowman, 2008), then capabilities which are concerned with incremental improvement would not qualify as dynamic capabilities under the authors' own definition in this earlier paper and regenerating dynamic capabilities is a difficult concept when dynamic capabilities themselves are renewing and refreshing capabilities.

3.4 Lack of Microfoundations

The confusion regarding the essential nature and definition of dynamic capabilities arises chiefly because the theory is situated at macro level and to date it has been unable to link the development of capabilities with individual and organisational strategies which build capabilities at micro level (Kraatz and Zajac, 2001; Priem and Butler, 2002; Helfat and Peteraf, 2009; Barreto, 2010). The most consistent criticism of the dynamic capabilities framework is that there is confusion between macro and micro levels and a lack of analysis of the microfoundations which provide an explanation as to the origins of dynamic capabilities and how they develop (Felin and Foss, 2005, 2009; Abell et al, 2008). When it is said that a firm possesses dynamic capabilities, this is in effect a useful and conveniently simple term for describing a complicated set of underlying actions and interactions which together comprise these capabilities (Abell et al., 2008, p. 492). Eisenhardt et al. (2010) define microfoundations as: '*the underlying individual-level and group actions that shape strategy, organisation, and, more broadly, dynamic capabilities'* (2010, p. 1263). While the

original authors (Teece et al., 1997) noted the importance of dynamic capabilities as higher order capabilities, they also acknowledge that they are underpinned by more systematic operational routines (Winter, 2003) or production routines (Aungier and Teece, 2006). Despite this acknowledgement, an explanation as to the origins of dynamic capabilities and underpinning microfoundations remains elusive.

The challenge is captured by Felin and Foss (2005) as follows: '*the problems associated with capabilities-based work are the result of the focus on collective-level constructs (e.g. routines, capabilities) at the expense of individual–level considerations'* (Felin and Foss, 2005, p. 442). In distinguishing between the collective and individual levels, the authors explain that they are not advocating analysis solely at the level of the individual. Rather, they are suggesting that the link between the individual and the collective levels is missing, and there is little exploration of the motivation, behaviours and actions of individuals which lead to the development of collective routines and capabilities. In focussing on the individual and on microfoundations therefore, they do not mean '*complete micro-reduction'* (Hodgson, 2012, p. 5).

In suggesting possible microfoundations, the dynamic capabilities framework emphasises two underlying levers for change; one is the capability to reconfigure and realign resources and the second is the ability to adapt and to change routines (Eisenhardt and Martin, 2000). The emphasis on resources reflects the foundations of the dynamic capabilities theory in the resource-based view of the firm. Reflecting Penrose (1959), it is the manner in which firms utilise and reconfigure their resources that is significant rather than the mere existence of the resources themselves. However dynamic capability theory does not elaborate on how to deliver these resource configurations and the organisational strategies which will change the human resource base, or change the collective behaviour of employees. Similarly, in relation to routines, while the literature describes routines as behavioural and cognitive (Becker, 2004) and while the patterns which underpin routines occur in the actions and interactions between individuals (Abell et al., 2008) there is little elaboration on the mechanisms for changing the behaviour or routines of individuals. For these authors routines and capabilities are useful shorthand for complicated patterns of individual action and interaction but they can only be fully explained and understood at micro level. They argue that '*specifically, there are no conceivable causal mechanisms in the social world that operate solely on the macro-level'* (Abell et al., 2008, p. 491). Routines are a central construct in the dynamic capabilities framework and many have argued that

routines are the '*central unit of analysis'* (Becker, 2004, p. 648) in strategic and organisational management but the origins and foundations of routines have not been explained. Yet they represent the 'most micro' level of analysis in the dynamic capabilities framework and in various literatures of strategic organisation (Felin and Foss, 2009, p. 158).

The challenge of developing and changing routines is considerable because they constitute such a large part of the organisational system. Nelson and Winter (1982) state that well defined routines '*structure a large part of organisational functioning at any particular time'* (Nelson and Winter, 1992, p. 97). They describe routines as '*the skills of an organisation'* (Nelson and Winter 1982, p. 124) and the '*repetitive pattern of activity in an entire organisation'* (Nelson and Winter 1982, p. 97). Routines also take time to develop and they become embedded as those who exercise them become attached to them as habits or '*habitual routines'* which are difficult to change (Ford, 1996). The key issue is that while routines and capabilities are fundamental to the theory of dynamic capability, the emphasis remains on collective and 'macro constructs' and there is little recognition of the need to explain the source of these capabilities or how they develop (Felin and Foss, 2005, 2009).

Furthermore, some authors note the inherent contradiction in relating routines to the foundations of dynamic capabilities (Gavetti, 2005; Felin and Foss, 2005; Hodgkinson and Healy, 2011). They argue that much of what happens in organisations is not of a routine nature particularly in dynamic organisational settings where managers are dealing with uncertainty and complexity. The literature has been predominantly concerned with the automatic, routine-based aspects of capability development and Gavetti notes that *'research on capabilities need microfoundations that capture more fully what we know about cognition and action in organisations'* (Gavetti, 2005, p. 599).

3.4.1 Attempts at Identifying Microfoundations

In attempting to address this issue, Teece (2007) looks at the microfoundations *of* dynamic capabilities. He identifies three categories of microfoundations; *sensing and shaping capabilities; seizing capabilities; and managing threats and reconfigurations* (Teece, 2007, p. 1342). *Sensing* capabilities are those which enable the company to search internally and externally for new opportunities and to be discriminating in analysing and filtering the findings in order to extract maximum potential value. *Seizing* capabilities are those which underpin the development of opportunities which are thrown up from the earlier sensing activities. Seizing might involve selecting new product architecture and new business

models, managing new platforms and complementarities and managing latent resistance to change. Finally, the third platform of capabilities is *the management of threats and reconfigurations*. This is the orchestration of internal capabilities to achieve fit with emerging innovations and involves the development of agile structures of support, new governance arrangements, effective knowledge management and learning capacities which assist the innovative process and support the development of new knowledge (Teece, 2007, p. 1341). However, these latter capabilities are strategic higher-order capabilities similar to what Chadwick and Dabu (2009) call managerial entrepreneurship. They are also reflective of what Katklato et al. (2010) call conscious human action, the action that is critical in bringing about transformative change. Therefore, in attempting to provide more practical and fine-grained descriptions of the microfoundations of dynamic capabilities, Teece merely provides a more detailed description of the dynamic capabilities themselves rather than the processes which underpin them. In this Teece has done what many others have done in attempting to proffer explanations of microfoundations by offering concepts on the same level as these higher order capabilities (Felin and Foss, 2005). Arguably, the word 'microfoundations' in Teece's paper's title is misplaced.

More recently, further attempts to broaden the debate on the need for clearer microfoundations have also emerged in the literature. Laamanen and Wallin (2009) in their research on capability development in three network security software firms, show that the cognitive microfoundations of capability development are different at different levels; operational, business unit and corporate levels. However, while the authors offer explanations on how strategic attention and decision-making affect the development of capabilities at different levels of the firm's corporate portfolio of business units, they do not offer explanations on the origins or microfoundations of capabilities.

Hodgkinson and Healy (2011) while supporting Teece's sensing, seizing and reconfiguration foundations, are critical of the fact that they are predicated upon outmoded cognition logic and do not give sufficient attention to emotional affective and non-conscious processes. In seeking to explain microfoundations, the authors argue that capabilities theory because of its economics-based origins overemphasises the cognitive aspects of strategy and decision-making at the expense of the emotional and affective elements. Significantly, they do not offer guidance on how these underpinning tools and practices can be developed. Eisenhardt et al. (2010) in exploring the microfoundations of performance in dynamic environments, highlight the role of leadership and how leaders variously manage the often

conflicting demands for efficiency and flexibility. They explain the individual attributes and behaviours of leaders in attempting to develop the microfoundations of performance, emphasising higher order thinking and expertise, abstraction, cognitive variety and interruptions in favouring flexibility over efficiency (Eisenhardt et al., 2010, p. 1271).

Notwithstanding more recent attention to the microfoundations of dynamic capability, and attempts to identify foundations in discrete areas, there remains a considerable gap in understanding the links between microfoundations and macro level capabilities. Agreement on the practical application of the theory to practice remains unresolved and an approach to building the foundations and building blocks of these strategic capabilities has not been developed or articulated (Abell et al., 2008; Barreto, 2010). This is understood by Abell and his colleagues who claim that '*while routines and capabilities are useful shorthand for complicated patterns of individual action and interaction, ultimately they are best understood at the micro level'* (Abell et al., 2008, p. 489).

3.4.2 Neglect of the Role of Employees

The lack of understanding and development of the microfoundations of the dynamic capabilities framework is related to, and a function of, the neglect of the role of individuals and the neglect of the role of employees. While the role of employees is of central importance in the theory of dynamic capability because it is founded on an evolutionary economics perspective highlighting the roles of routines, path dependencies and organisational learning (Bareto, 2010), employees have been largely ignored in the theory and literature of dynamic capabilities. Teece and his colleagues (1997) in the original definition afford central importance to strategic management (Thompson, 2007) but make little reference to the role or motivation of employees. A reference to employees in a more recent article relates to the role of collective bargaining in wage negotiation: '*through the use of collective bargaining, employees in industries insulated from global competition have been able to appropriate economic surplus'* (Teece et al., 2007, p. 1340). Teece then goes on to suggest that curtailing the influence of collective bargaining on wages could be seen as an element of dynamic capability in itself. This reference to employees highlights Teece's limited perception of their role in the dynamic capabilities framework.

Yet, much of the dynamic capability literature is concerned with changing behaviour - building and reconfiguring internal and external competencies (Teece et al., 1997), modifying the resource base (Helfat and Peteraf, 2009) which must include the human resource base, changing routines, changing behaviour and collective activity (Eisenhardt and Martin, 2000; Zollo and Winter, 2002) and ultimately changing the abilities, capacities, processes and routines of the firm (Bareto, 2010). Changing behaviour on this scale and changing collective behaviour requires strategic human resource management capability and capability in changing the behaviour of employees. Yet very little in the literature is devoted to human resource management capability. The neglect of the role of employees in the dynamic capability literature may reflect, more generally, management resistance to acceptance of the role of employees in building capability. For example in a study of innovation in SME's, McAdam and Keogh (2004) encountered management resistance to the acceptance of employees' ability to generate new knowledge in learning networks and communities of practice.

3.4.3 The Nature of Knowledge and Dynamic Capability

The neglect of microfoundations and the role of employees in dynamic capabilities theory illuminate a further challenge, namely the exploitation and integration of the tacit knowledge that resides in the members of the organisation. Much organisational knowledge is *tacit* rather than *explicit or codified* and local rather than *global* (Jenson et al., 2007, p. 681). This tacit knowledge is embedded in the processes and practices of workplaces, organisations and in the employees themselves. Recent studies on organisational knowledge further illuminate the significance of tacit and local dimensions of knowledge and the role of employees. The dichotomy between tacit and explicit or codified knowledge has been challenged (Gourlay and Nurse, 2005; Jakubik, 2011). Knowledge is increasingly seen as indistinguishable from the 'knower' (Wenger, 2001. p. 68). If knowledge cannot be separated from the knower, knowledge is therefore a distributed activity in an organisation and the role and significance of the 'knowers' is of paramount importance. The belief that all knowledge has a tacit dimension, relates back to Polanyi's original and seminal book 'The Tacit Dimension' in which he describes hidden knowledge as 'tacit knowing' (Polanyi, 1962, p. 9). Contrary to Nonaka's influential theory (1994), where the conversion is primarily a cycle which moves from tacit to explicit and codified knowledge, for Polyani explicit knowledge must rely on being tacitly understood.

If knowledge cannot be separated from the *'knower'* (Wenger, 2001. p. 68), knowledge is therefore a distributed activity in an organisation and the role and significance of the 'knowers', or employees is of considerable importance. Understanding knowledge as socially constructed and embedded in the employees means that *'value creating knowledge resides in knowledge workers throughout the organisation'* (McAdam and McCreedy, 2000, p. 161*).* Understanding knowledge as resting in the 'knower' and in the 'knowers' throughout the organisation, creates new challenges for the dynamic capabilities framework. The challenge now becomes one of understanding how to nurture, develop and access the 'knowing' that is distributed throughout the organisation's personnel (Tsoukas, 1996; Lam 2000; Wenger, 2001; Jakubik, 2011).

3.5 Addressing the Problems

From this review of the literature, it is evident that many the underlying problems of definition and the tensions in understanding the nature of dynamic capabilities lie in considering dynamic capabilities in abstractions at macro level rather than in concrete organisational processes and competencies which operate at micro level. The neglect of microfoundations has meant that despite nearly two decades of theoretical and some empirical analysis, fundamental questions remain in respect of the definition of dynamic capabilities and the origins and foundations of the underpinning routines (Felin and Foss, 2009). Furthermore, Coleman et al. (1990) argue that explanations that involve the micro-level have the properties of being more stable, fundamental and general than macro-level explanations.

In addressing the problem, Rindova and Kotha (2001) begin to unlock this complexity. The authors show how Yahoo's dynamic capabilities developed in the form of learning routines from '*simple replication* to *purposeful recombination* to *proactive development of organisational competences'* (2001, p. 1274) in change management and company acquisition. While these may be regarded as basic routines, they embody a qualitative difference in that they involve conscious human behaviour and action which is critical in transforming existing routines and even disrupting order and stability (Katkalo et al., 2010).

Following Rindova and Kotha's approach, a closer exploration of the literature is undertaken to begin to disaggregate the underlying concepts of dynamic capabilities. Through this exploration it may be possible to identify more clearly the underlying organisational '*processes and competencies'* (Eisenhardt and Martin, 2000, p. 1107) which

underpin the development of dynamic capabilities (Dosi et al., 2009). This is a first step in attempting to fill the gap identified by Abell et al. (2008) identifying possible microfoundations and suggesting a more stable hierarchy of processes (Winter, 2003; Ambrosini et al., 2009) which chart the evolution of capabilities from macro to micro levels. The following analysis suggests a disaggregation of dynamic capabilities under two broad categories:

- **Dynamic capabilities and high-level descriptions of elements of dynamic capabilities**: At this level are the descriptions of the strategic high level processes and activities which describe dynamic capabilities and elements of dynamic capabilities.
- **Possible microfoundations: underlying processes:** The second category relates to the underlying processes which lead to the development of dynamic capabilities and concern individual and collective learning in the form of *learning processes, social interactions, and knowledge creation and management processes.* These latter processes relate more closely to individual behaviour and interaction at micro level (Felin and Foss, 2005, 2009; Abell et al., 2008). They tend to be more practical in nature and more useful in exploring the nature of the processes which underpin dynamic capabilities and how these processes might be more directly relevant in organisational contexts. Because there is a strong interdependency between learning, social interaction and knowledge creation and management, inevitably there is a degree of overlap in these processes. A summary of these processes is provided in Table 3 .1 below.

Table 3.1: Disaggregated Dynamic Capabilities and Underlying Processes

Dynamic capabilities: High level descriptions of dynamic capabilities and elements of dynamic capabilities
Reconfiguration of support activities; Reconfiguration of core processes; Leveraging existing processes (Bowman and Ambrosini, 2003). Knowledge management capabilities (Lichtenthaler and Lichtenthaler, 2009) Sensing; Seizing; Managing threats and Reconfiguration (Teece, 2007)
Possible Microfoundations: Underlying processes
Learning practices Repetition and experimentation; Repeated practice; Codification of tacit knowledge; Pacing of experience; Sequencing steps (Eisenhardt and Martin, 2000) Highly deliberate learning processes (Zollo and Winter, 2002) Learning is collective and organisational; Learning processes are intrinsically social and collective; Learning requires common modes of communication; New routines emerge from learning; Organisational knowledge generated from such learning activity resides in new patterns of activity or routines; Networking facilitates learning (Teece, 2007)
Social interaction processes Social interaction and relationships (Kogut and Zander, 1995; Nonaka, 1994; Teece, 2007). Social relationships; abilities, motivation and opportunities to create, retain and transfer knowledge (Argote et al., 2003). Knowledge as a catalysis for innovation is socially constructed as well as scientifically constructed (McAdam, 2000) Knowledge sharing social interaction mechanisms (Lichtenthaler and Lichtenthaler, 2009) Creating organisational structures and systems, culture and climate for sharing knowledge and generating new ideas (Lawson and Samson, 2001). Interactions amplify and develop new knowledge (Nonaka, 1994). The firm as a repository of social knowledge (Kogut and Zander, 1995).
Knowledge creation and management processes Exploitation of existing knowledge; Exploration of new knowledge (Eisenhardt and Martin,2000) Creating new knowledge through *Doing, using and interacting* (Lundvall, 2007). Creating, retaining and transferring knowledge (Argote et al., 2003). Knowledge management; an integrated approach to managing '*the actual and potential flows of knowledge creation, transfer, retention and use within and across organisations'* (Prieto and Easterby-Smith, 2002, p. 502) Integration of internal and external diverse knowledge bases as the essence of dynamic capability (Iansiti and Clark, 1994). Six knowledge capacities; inventive, absorptive, transformative, connective, innovative, and desorptive capacities (Lichtenthaler and Lichtenthaler, 2009) Knowledge management processes; Information and knowledge-sharing; Motivating employees and executives to remain with the firm; Forging alliances and partnerships for knowledge-sharing; Implementing written knowledge-management rules (Prieto and Easterby-Smith, 2002). Harnessing the competence base; Organisational intelligence; Creativity and idea management; (Lawson and Samson, 2001) Knowledge taxonomies : Tacit/articuble; Observable/not observable; Complex/simple; Dependent/independent of a system (Winter, 1987) Codifiability, Teachability, Complexity, System dependent, and Product observability (Kogut and Zander, 1995)

3.5.1 High Level Descriptions of Dynamic Capabilities

Under the first category are elements of higher order strategic dynamic capabilities such as *reconfiguration and leveraging* activities; reconfiguration of support activities; reconfiguration of core processes and leveraging existing processes (Bowman and Ambrosini, 2003). These are what Teece call*s 'orchestration capacities'* (2007, p. 1341) which underpin an enterprise's capacity to successfully innovate and to gain long-term competitive advantage.

'Dynamic capabilities relate to high-level activities that link to management's ability to sense, and then seize opportunities, navigate threats and combine and reconfigure specialized and cospecialised assets to meet changing customer needs, and to sustain and amplify evolutionary fitness, thereby building long-run value for investors' (Teece, 2007 p. 1344)

In this category also are Teece's (2007) three categories of microfoundations, *sensing* and shaping capabilities, *seizing* capabilities and *managing threats and reconfigurations.*

Included also in this group of high-level descriptors of capabilities are Lichtenthaler and Lichtenthaler's (2009) knowledge management capabilities. The authors distinguish between the higher level dynamic capability of knowledge management and lower order, less strategic knowledge capacities. Specifically, '*while the knowledge capacities underscore the diverse challenges in managing internal and external knowledge, knowledge management capacity emphasises the need for co-ordinating the process for renewing a firm's knowledge base'* (Lichtenthaler and Lichtenthaler, 2009, p. 1331). While the knowledge capacities themselves are important resources, the capability to reconfigure, co-ordinate and renew these capacities is a strategic and dynamic capability.

The strategic capacity for internal and external integration is also positioned at this higher level as it is an important element in Teece et al.'s (1997) original definition of dynamic capability. Based on evidence from product development in the automobile and mainframe computer industries, Iansiti and Clarke (1994) posit that it is the capacity for internal and external integration of diverse knowledge bases that is of supreme importance in the development of dynamic capability for innovation. The essence of this integration is the '*the capacity to merge new knowledge about the impact of possibilities with deeper*

accumulated knowledge of the complex existing capability base of the organisation'' (Iansiti and Clarke, 1994, p. 602).

3.5.2 Underlying Processes and Practices: Learning Processes

In Teece's (2007) disaggregation of the learning processes which constitute dynamic capabilities, he emphasises a number of key underlying processes which enable learning. Learning is collective and organisational, intrinsically social and collective and involves repetition and experimentation**.** It is a process by which repetition and experimentation enable tasks to be performed better and quicker and enable new production opportunities to be identified. It involves organisational as well as individual skills through joint contributions to the understanding of problems. Organisational knowledge generated by such activity resides in new patterns of activity or routines which are patterns of interactions that represent successful solutions to particular problems. Networking facilitates new learning and new routines emerge from learning. Collaborations and partnerships can be vehicles for new learning, helping to identify dysfunctional routines and preventing strategic blind spots (Teece, 2007, p. 1339).

Similarly Eisenhardt and Martin (2000) argue that learning mechanisms guide the evolution of dynamic capabilities. Similar to Teece's repetition and experimentation, these underlying learning mechanisms include: repeated practice, which is positively associated with the accumulation of tacit and explicit knowledge. Codification and formalisation mechanisms make the application of learning easier and accelerate the development of organisation-wide routines. Mistakes play a role in the evolution of learning capabilities as small losses and small failures cause individuals to pay greater attention to the process. It is important also to pace experience and sequence steps as experience that comes too fast can overwhelm managers (Eisenhardt and Martin, 2000, p. 1114).

For Zollo and Winter (2002), highly deliberate learning processes such as experience accumulation, knowledge articulation and codification are important mechanisms in the development of dynamic capabilities. Dynamic capabilities, as they are deployed through learning and repetition and in their usage as they transform VRIN resources, are therefore likely to be path-dependent (Zollo and Winter, 2002; Bowman and Ambrosini, 2003). They are also contingent on social capital dimensions such as leadership and trust (Blyer and Coff, 2003) and the individual's internal and external social networking and information sharing.

3.5.3 Social Interaction Processes

Echoeing Teece, Lawson and Samson (2001) suggest that for innovation to occur there is a need to combine the technological and social perspectives of knowledge management and learning. This resonates with Lundvall's (2007) concept of linking science and technology based innovation with experience-based innovation. In this categorisation, the STI mode of innovation is characterised by the development of codified scientific and technical knowledge, and experience-based innovation is the creation of new knowledge through the DUI mode of innovation, *doing*, *using* and *interacting* (Lundvall et al., 2007). Social relationships are an important part of the innovation process as they provide individuals with abilities, motivation and opportunities to create, retain and transfer knowledge (Argote et al., 2003). And while it is true that much knowledge resides in individuals and while ideas are formed in the minds of individuals, social interaction plays a critical role in developing these ideas. These interactions contribute to the amplification and to the development of new knowledge (Nonaka, 1994) and in these respects the firm can be understand as a repository of social knowledge (Kogut and Zander, 1992, 1995).

3.5.4 Knowledge Processes

The importance of knowledge as a foundation of dynamic capability for innovation has long been acknowledged in the dynamic capabilities literature (Iansiti and Clarke, 1994; Teece et al., 1997; Eisenhardt and Martin, 2000; Lazonick, 2003: Zollo and Winter, 2002). In one of the earliest definitions of dynamic capability, Iansiti and Clarke place the capability to generate and regenerate the knowledge base of the firm as the very essence of dynamic capability and the capacity to consistently adapt and renew the knowledge base as the key to dynamic performance.

'*Dynamic capability is the capacity of an organisation to consistently nurture, adapt, and regenerate its knowledge base, and to develop and retain the organisational capacities that translate that knowledge base into useful action'* (Iansiti and Clark, 1994, p. 563).

Dynamic capabilities are seen to evolve through pathways that can be described as the evolution of knowledge within the organisation (Zollo and Winter, 2002). The continuous renewal of the firm rests on the exploitation of existing knowledge and the exploration of new knowledge (Eisenhardt and Martin, 2000). In modern knowledge-driven economies firms are increasingly aware that individual and collective knowledge is a major factor of economic performance and a major source of competitive advantage (Grant, 1996).

Knowledge is a strategically important resource and if knowledge resides in the members of the organisation, the '*knowers*' (Wenger, 2001. p. 68, then processes which integrate and maximise the individual employee's specialised knowledge (Grant, 1996) are important underpinning microfoundations of more strategic knowledge management capability. The knowledge competence base of the organisation's employees must be continually adapted and renewed to enable it to drive the innovation process and create products and services that match future customer expectations (Iansiti and Clark, 1994).

Linking knowledge with dynamic capabilities and innovation, Lawson and Samson (2001) look at foundational processes and propose a model that operationalises innovation as a dynamic capability dependent on seven conditions*:* vision and strategy; harnessing the competence-base; organisational intelligence; creativity and idea management; organisational structure and systems; culture and climate; and the management of technology. At least three of these conditions relate to knowledge management, *harnessing the competence-base*; *organisational intelligence; creativity and idea management*, and two further conditions are concerned with creating supportive organisational conditions for sharing knowledge and generating new ideas and new knowledge: organisational structure and systems; and culture and climate. McAdam, (2000) also found that knowledge management systems are important catalysts for innovation in organisations and are socially as well as scientifically constructed. Knowledge management systems were shown to lead to increased new product and service development demonstrating that '*there is a clear link between … knowledge management and innovation'* (2000, p. 240).

Taxonomies and constructs which characterise a firm's knowledge leading to innovation are useful as they can help disaggregate the complexities of knowledge management and transfer within the company and they also help to identify possible microfoundations of knowledge management dynamic capability. There are a number of such classifications. For example Winter (1987) identifies four dimensions of a firm's knowledge: tacit/articulable, observable/not observable in use, complex/simple and dependent/ independent of a system. Kogut and Zander (1995) develop these dimensions further and propose that knowledge is classified using the following constructs; codifiability, teachability, complexity, system dependence and product observability. In linking knowledge to innovation, Lichtenthaler and Lichtenthaler (2009) propose a framework of the following six knowledge capacities; inventive, absorptive, transformative, connective,

innovative, and desorptive capacities. Inventive capacity is the capacity to develop new knowledge internally and transformative capacity is the capacity to retain this internally generated knowledge over time. Absorptive and desorptive capacity are the generation and exploitation of new knowledge from external sources and connective knowledge capacity is the firm's ability to retain knowledge in inter-firm relationships. These external knowledge capacities are important dimensions of open innovation. For Lichtenthaler and Lichtenthaler, innovative capacity is the application of all knowledge, that which has been acquired and retained both inside and outside the firm. These foundational knowledge capacities combine to create strategic and dynamic knowledge management capability.

In exploring the challenge of exploiting and capturing local and tacit knowledge, Zollo and Winter (2002) underline three important strategies: experience accumulation: knowledge articulation; and knowledge codification, sense–making and evolution. Knowledge codification helps to develop and grow knowledge and expands thinking so it is therefore an important part of an organisation's approach to knowledge management. Knowledge articulation and sharing improves knowledge and learning in the organisation and is part of what Zollo and Winter call the knowledge evolutionary cycle (Zollo and Winter, 2002).

The organisation's ability to identify, articulate, share, codify, manage and grow knowledge and, in the process, turn employees' tacit and local knowledge into more explicit and codified knowledge which is globally accessible are important underpinning knowledge creation and knowledge management processes (Lundvall and Johnson, 1994; Zollo and Winter, 2002; Jenson et al., 2007: Teece, 2007). These combinations at micro level elucidate the potential microfoundations which together combine to develop dynamic capability in the organization's capacity for innovation.

3.5.5 Linking Dynamic Capabilities with Human Resource Management Literatures

This chapter offers an initial attempt at disaggregating high-level dynamic capabilities in order to identify and delineate the underlying processes which can help explain how these strategic capabilities evolve and how a hierarchy of processes develops (Winter, 2003; Ambrosini et al., 2009). This disaggregation can also help to identify the potential microfoundations of dynamic capability and the evolutionary and temporal nature of the development of these capabilities. However, to understand the development and growth of these underlying processes of collective learning, social interaction and knowledge

creation processes, it is necessary to draw on other literatures. This requires engagement with complementary areas of study such as the field of human resource management and, in particular, organisational innovation and innovation climate literatures. The need for complementarity and connection with the human resource management literature is acknowledged by Teece: '*many of the issues discussed here have, in the past, fallen under the rubric of human resource management; a closer connection of these issues to strategic management would appear to be warranted*' (Teece, 2007, p. 1340). The study will therefore examine the organisational dynamics of dynamic capabilities theory with specific reference to the human resource base of the firm. The focus is on employees and in particular the study aims to provide useful insights into the determinants of change in the behaviour and routines of employees thus creating dynamic capability for innovation in the organisation. This follows the dynamic capabilities model exploring more deeply how to interact with the human resource base so as to reconfigure and refresh the existing resources and create new ones (Ambrosini and Bowman 2009, p. 29). In this way, dynamic capability theory provides the scaffolding that can help explain the role of organisational innovation in bringing about innovation outcomes in the form of product, service and workplace innovation.

3.6 Summary

Dynamic capabilities are an important theoretical framework in which to explore and better understand the internal organisational dynamics of innovation (Zollo and Winter, 2002; Bowman and Ambrosini, 2003) They are critical to the innovative process as they embody the organisational innovation, knowledge management capabilities and strategic routines by which organisations alter their resource base to create new value-creating strategies (Grant, 1996; Easterby-Smith et al., 2009).

However, despite Teece's (2007) attempt to define the microfoundations of dynamic capabilities, they remain difficult to identify and the issue of how dynamic capabilities can be built remains elusive. As the theory is founded in an evolutionary economics perspective the role of routines, employees and organisational learning are critical (Bareto, 2010). Yet very little in the literature is devoted to employees or their perspectives and while change is at the heart of the dynamic capabilities framework, the framework does not adequately articulate the determinants of change in the behaviour of the organisation's employees.

In table 3.1, this chapter offers an initial attempt at disaggregating high-level dynamic capabilities into the underlying processes or microfoundations associated with the development of these strategic capabilities (Winter, 2003; Ambrosini et al., 2009). This disaggregation may explain the evolutionary and temporal nature of the development of dynamic capabilities. However, to understand the development and growth of these underlying processes such as collective learning, social interaction and knowledge creation processes, it is necessary to draw on other literatures. This requires engagement with complementary areas of study such as the field of human resource management and in particular organisational innovation and innovation climate literatures which are reviewed in the following two chapters.

Chapter Four: Organisational Innovation: Employer Strategies

4.1 Introduction

The preceding chapter highlighted how dynamic capabilities provide an important theoretical framework for the study of organisational innovation (Teece et al., 1997; Zollo and Winter, 2002). While the concept of dynamic capabilities represents an encompassing framework, incorporating a range of collective activities, the underlying developmental processes or microfoundations (Teece, 2007; Abell et al., 2008) which are required to build dynamic capabilities remain unclear. To explore the development and growth of microfoundations, it is necessary to draw on other literatures and, in particular, literatures which address the purposeful management of human resources in order to achieve innovation outcomes. This is the human resource management (HRM) literature and more specifically a strand of this literature which is concerned with exploring the link between human resource management (HRM) practices and innovation, often described as organisational innovation (Hage, 1999; Read, 2000; Shipton et al., 2006).

The aim of this chapter therefore is to explore the human resource management strategies and practices which have been found to enable innovation outcomes. Allied to this, the chapter examines supporting evidence from the Irish National Workplace Survey of Employers (2009). The intention is to identify strategies which represent broad guiding principles or the '*architectural rubric*' (Becker and Gerhart, 1996, p. 786) of inputs designed to build innovation capability in organisational settings. At the outset, it must be acknowledged that studies linking organisational strategies to innovation outcomes are in a minority as previous human resource management studies have largely concentrated on other performance outcomes such as financial outcomes, productivity, profit figures, market value or quality (Laursen and Foss, 2003; Taylor and McAdam, 2004; Savanevicienne and Stankeviciute, 2010).

This chapter will therefore explore how various studies offer insights into the organisational innovation strategies associated with innovation outcomes. Firstly, it will explore the varying definitions of organisational innovation. While there are many definitions, the main objective of this exploration is to consider the concept of organisational innovation and to define its boundaries and limitations. Secondly, studies which analyse the

organisational innovation strategies which have been associated with successful innovation will be examined. Thirdly evidence from the Irish National Workplace Survey of Employers (2009) will be considered. Fourthly, in developing microfoundations, the convergence between the underlying processes of dynamic capabilities and organisational innovation will be examined. Fifthly, the chapter will consider 'the black box' or HR strategies-performance link challenge (Becker and Gerhart, 1996; Boselie et al., 2005; Guest, 2001, 2011) in overcoming difficulties in linking organisational innovation strategies to innovation outcomes. Finally, the chapter will conclude with an outline of the proposed research investigation arising from the literature review and will summarise the particular organisational innovation strategies and outcomes to be investigated.

4.2 Definition and Understanding

Because the study of organisational innovation is as yet in its infancy (Read, 2000: Lynch, 2007), there are wide variations and a considerable amount of confusion on the definitions of organisational innovation and the factors which support such activities. Definitions of organisational innovation broadly fall into three categories. The first category is by authors who subscribe to the broadest possible definition of organisational innovation as any innovation that occurs within the organisation (Zaltman et al., 1973; Slappendel, 1996; Hage, 1999). The second use of the term organisational innovation arises from the need to distinguish it from other forms of innovation such as product and service innovation and innovations in production processes and markets (Lam, 2005; Armbuster et al., 2008). Thirdly, other authors offer more practical working definitions of organisational innovation as the introduction of new and innovative bundles of practices such as training, consultation, employee involvement mechanisms and employee voice (Appelbaum 2000; Black and Lynch, 2001, 2004; Lynch, 2007). Because the introduction of these practices is new to the organisation, these are regarded as organisational innovations in themselves (Conway and McMackin, 1997; Read, 2000). The next section examines the origins of the varying definitions, and considers how definitions of organisational innovation vary depending on these origins.

4.2.1 Broader Understanding of Organisational Innovation

The origins of the broader term organisational innovation arise from the need to distinguish it from more technical forms of innovation and from more formal R&D generated innovation (Armbruster et al., 2008; Green, 2009; Ramstad, 2009). The term organisational innovation is used deliberately to move innovation beyond the research and development department into all areas of the organisation (Tidd et al., 2001). Jenson et al. (2007) in advocating that more prominence be given to organisational innovation, describe more experience-based or DUI modes of innovation, doing, using and interacting as that which occurs in everyday interactions in firms and organisations. The positioning of organisational innovation in this broader context is captured by Taylor and McAdam, (2004) who advocate that '*innovation must not remain in the domain of technological innovation but should be seen in the context of broader innovation management where there are opportunities for employees at all levels in all areas to get involved and make meaningful contributions'* (2004, p. 36). This broader understanding of organisational innovation is relevant to this study, because as outlined in Chapter Two, a key concern is to situate organisational innovation more firmly in national innovation policy. Also, innovation constitutes part of the system that produces it (Van de Ven et al., 1999; Armbruster et al., 2008; Green, 2009; Cavagnou, 2011). Therefore, organisational innovation in this broader sense is the overarching framework, encompassing the organisational, social and cultural systems within which individuals operate and which are fundamental in shaping innovation outcomes (Cavagnou, 2011).

Understanding organisational innovation in this broader sense has led to definitions that are wide and all-encompassing and are often indistinguishable from definitions of innovation itself. For example, Slappendel (1996) subscribes to the broadest possible definition and notes that newness or novelty is the key distinguishing feature of organisational innovation. She borrows the following definition of innovation from Zaltman as '*any idea practice or material artefact perceived to be new by the relevant unit of adoption*' (Zaltman et al., 1973, p. 10). Hage (1999) also defines organisational innovation broadly as 'th*e adoption of an idea or behaviour that is new to the organisation; the innovation can be a new product, a new service, a new technology or a new administrative practice'* (1999, p. 599). Anthony Read (2000) offers a definition of innovation which incorporates a broad understanding of the processes as well as the outcomes. He describes it as "*a dynamic and interactive process of creating or modifying an idea and developing it to produce products, services, processes, structures or policies that are new to the*

organisation" (Read, 2000, p. 96*).* Shipton et al. (2006) also offer a broad and all-encompassing definition describing both processes and outcomes as follows: '*the intentional introduction and application within an organisation of ideas, processes, products and procedures new to the unit of adoption, designed to significantly benefit the organisation or wider society'* (2006. p.3).

A second interpretation of the broader definition is that the origins of the term organisational innovation arise from the need to distinguish it from other forms of innovation such as product and service innovation and innovations in production processes and markets (Armbuster et al., 2008). This interpretation draws on the Schumpeterian definition of innovation (Schumpeter, 1934) which involves five categories – new products, new production methods, new markets, new sources of supply and new forms of organisation. New forms of organisational systems, structures, design and business models are therefore understood as forms of innovation in their own right and are classified under the rubric of organisational innovation. Lam (2005), summarising the varying definitions of organisational innovation in this respect, broadly classifies the organisational innovation literature into three different streams: the literature on organisational design; the literature on organisational cognition, learning and innovation and the third stream of literature which focuses on organisational change and adaptation, and the processes that underlie the creation of new forms of organisation (Lam, 2005). The overlaps and interconnections between these categories will be evident in the definitions of organisational innovation as innovative work practices which will be explored in the following section.

4.2.2 Organisational Innovation as Innovative Work Practices

In the third narrower interpretation, many authors offer a more practical working definition of organisational innovation as bundles of innovative practices in the organisation of work. For example, Black and Lynch (2001, 2004) consider workforce training, decentralised decision making, employee discretion in determining work and shared rewards as a form of organisational innovation. Murphy (2002) defines organisational innovation as encompassing flexible working arrangements, new management systems such as Total Quality Management (TQM) and changes in external relations such as outsourcing. Lynch (2007) proposes the following components, '*workforce training, employee voice, work design, including the production of cross-functional production processes and shared rewards'* (2007, p. 6). The author explains that this is not meant to be an exhaustive list, rather a range of practices which have been found to enhance the productive capacity of

the firm. Similarly, Appelbaum (2000) in highlighting the importance of organisational learning in innovation defines the key components of organisational innovation as adaptive teams, incentive pay schemes and employer-provided training. The Oslo manual's (OECD, 2005) definition also confines itself to organisational innovation inputs as follows: '*an organisational innovation is the implementation of a new organisational method in the firm's business practices, workplace organisation* or *external relations* (OECD 2005, p. 51-52). Organisational innovation is therefore understood as a form of innovation in its own right and as the descriptor of the organisational practices, strategies and arrangements which are new to the organisation.

4.2.3 Definition and Understanding of Organisational Innovation in this Study

In undertaking this study, it is recognised that innovation is a very broad topic and there are increasingly many different approaches to the study of innovation. The study of organisational innovation is but one of these approaches. Similarly, as outlined in the preceding sections, there are a number of different definitions and interpretations of organisational innovation. Therefore it is important to provide clarity on the approach to innovation adopted in this study. The understanding of organisational innovation adopted in this study combines elements of both broad and narrow definitions. The broader understanding of organisational innovation is relevant as an encompassing framework to place this type of innovation more firmly in national innovation policy and as the context for the exploration of the dynamics of innovation in organisational settings. More narrowly, because the aim of the study is to identify the organisational and human resource management strategies and climate which best support innovation in organisations, the understanding of organisational innovation adopted in this study is aligned to that of innovative work practices or HR strategies (Appelbaum, 2000; Black and Lynch, 2001, 2004; Lynch, 2007). The particular focus is on the association between organisational innovation strategies, climate and innovation outcomes in order to better understand the microfoundations of innovation capability. The intention is to identify more broadly the strategies, or elements of the architecture (Becker and Gerhart, 1996) of successful innovation in organisations. Purposefulness is an important dimension of the careful and planned intentionality of these strategies in developing dynamic capability (Helfat and Peteraf, 2009) for innovation because what determines the purpose of organisational innovation policies determines innovation outcomes (Cavagnou, 2011).

4.3 Organisational Strategies Innovation and Innovation Outcomes

There is a dearth of studies which examine the internal organisational stategies which lead to successful innovation outcomes (Macky and Boxall, 2007; Taylor and McAdam, 2004). Using the definition of organisational innovation as that of innovation in work practices, a number of empirical studies have analysed the impact of organisational innovation on business performance. For example, Ichniowski, Shaw and Prennushi (1997) found that steel plants which reported the introduction of innovative employment practices reported higher productivity levels from production workers by 6.7%. Pil and MacDuffie (1996) also found that higher levels of performance and product quality were found in automotive plants which had introduced forms of organisational innovation. Black and Lynch (2001) found that increasing employee involvement in the decision processes of firms leads to higher levels of productivity. Caroli and Van Reenen (2001) also find a positive relationship between the introduction of new workplace practices and productivity based on a sample of French firms. On the other hand, Freeman and Kleiner (2000) found no significant relationship between organisational innovation and firm productivity while Capelli and Neumark (2001) found that the introduction of innovative work practices has no apparent effect on firm efficiency.

While the majority of these studies, link innovative work practices positively with performance, the outcomes relate to productivity and business performance and whether these innovative practices affect innovation outcomes has not been measured. A smaller number of studies link organisational innovation inputs with innovation outcomes. These studies offer important insights into the organisational strategies which are associated with innovation performance. These are summarised in table 4.1. and will be considered in the next section.

In a review of studies on organisational innovation Slappendel (1996) notes the importance of building relationships with customers and suppliers, the presence of environmental factors such as change and uncertainty and environmental heterogeneity and communication. Innovation is facilitated by extensive communication between the organisation and its environment as is the degree of professionalism of organisational members. In reviewing the literature on the role of HR in building a culture of innovation, Conway and McMackin (1997) identify similar factors albeit with a greater emphasis on the importance of tolerating failure and encouraging risk-taking and the development of new

ideas. The authors also emphasise the role of management but a particular participative style of management as well as teamwork, empowered employees and flexible structures.

In a major review of the literature and studies on organisational innovation up to and including 1998, Hage (1999) seeks to summarise the causes and consequences of innovation. He notes the importance of three critical variables: organic organisational structure, organisational high-risk strategy, and complexity of the division of labour in the form of specialisation, departmentalisation, professionalisation and technical knowledge resources. In a further review of the literature and studies examining the determinants of successful organisational innovation, Read (2000) identified three key determinants of successful innovation as: management support for an innovative culture, customer/market-focus and internal and external networking. From these studies nine further elements were cited; HR strategies emphasising innovation, teams and teamwork, knowledge management, development and out-sourcing; leadership, creative development; strategic posture, flexible structures, autonomous improvement and technology adoption.

In an empirical study on the key HR practices that are 'predictors' of innovation, Shipton et al. (2006) identify six key indicators; exploratory learning, induction, appraisal, contingent reward, team working and a combination of exploratory learning and existing knowledge. Significantly, they conclude that exploratory learning, which includes secondments and knowledge management practices, is a pervasive strategy for encouraging innovation but must be accompanied by training.

As the above review demonstrates, there are number of factors and strategies in the literature that are associated with innovation outcomes. These include contextual and environmental factors such as the degree of flux and uncertainty in the marketplace (Slappendel, 1996), strategic positioning, flexibility of organisational structures (Read, 2000) and departmentalisation and complexity in the division of labour (Hage, 1999). Extraneous and structural factors such as these are beyond the scope of this study which aims to identify the internal HR and managerial strategies which are associated with innovation outcomes.

Strategic Human Resource Management (SHRM) and High Performance Work Systems (HPWS) literature linking strategies to performance outline a range of strategies or *bundles* of strategies (MacDuffie, 1995; Ichniowski et al., 1997; Subramony, 2009) associated with improved performance, in some cases including innovation performance. Broadly these incorporate the following five sets of practices: *staffing* which involves rigorous selection and induction processes; *merit-based performance management* and appraisal systems incorporating contingent reward and incentive pay; *communication and participation arrangements* including cross-functional teams and information-sharing systems; *high levels of training and development*; and *flexible work arrangements* (Applebaum, 2000; Combs et al., 2006; Lynch, 2007; Takeuchi et al., 2007; Guthrie et al., 2009, 2011). Similarly, organisational innovation literature outlines innovative work practises which are reflective of the HPWS bundles. These include workforce training, decentralised decision making, employee discretion in determining work, employee voice, and work design such as cross-functional production processes and shared rewards (Black and Lynch 2001, 2004; Lynch, 2007). To these Murphy (2002) adds new management systems such as Total Quality Management (TQM) and changes in external relations such as outsourcing.

Clearly the range of strategies associated with improved organisational performance in the literature is considerable and many of these strategies both collectively and individually offer opportunities for research in exploring their association with innovation performance and outcomes. However, research based on a comprehensive index of all of the elements in the HPWS, SHRM and innovative work practices literature is not feasible in this study. The study is based on a large national database of responses from a National Workplace Survey of employees which was not designed for such a purpose. For example employee perceptions of selective staffing and sophisticated performance appraisal and reward systems were not included in the survey. Nonetheless, the survey data offers rich opportunities for exploring the association between particular strategies and innovation outcomes and identifying key elements of the organisational HR architecture designed to build innovation capability in organisational settings (Becker and Gerhart, 1996). Drawing on the literature and exploiting the opportunities offered by the survey data, a selective group of organisational innovation strategies have been identified for investigation. The following organisational innovation strategies have been identified because they were particularly strongly associated with innovation outcomes in the literature. These strategies are as follows:

- Empowerment enhancing strategies (Conway and McMackin, 1997; Read, 2000; Black and Lynch, 2004; Shipton et al., 2006; McLeod and Clarke, 2009)
- Relational capital, positive social interaction (Damanpour 1991; Conway and McMackin, 1997; Read, 2000; Skarzynski and Gibson, 2008)
- Learning strategies (Leavy and Jacobson 1997; Lundvall, 1998, 2007; Read, 2000; Shipton et al., 2006)

Strong managerial support for innovation is an overarching factor associated with innovation outcomes (Conway and McMackin, 1997; Read, 2000; Hamil, 2007; McLeod and Clarke, 2009). However, perceptions of managerial and supervisory support will be investigated through innovation climate which will be the subject of the next chapter.

The organisational innovation strategies outlined above will be considered in the next section. A summary of these strategies in the literature and a sample of authors is outlined in Table 4.1 below.

Table 4.1: Organisational Strategies Associated with Innovation Outcomes

Categories	Strategies	Sample of Authors
Management support / positive relationships	Encouraging risk-taking	Hage, 1996
	Tolerating risk and failure	Conway and McMackin (1997)
	Management support for innovation	Read (2000) Damampour (1991)
	Encouraging new ideas	Conway and McMackin (1997)
	Participative management style	Conway and McMackin (1997) McLeod and Clarke (2009)
	Visible leadership for innovation ; strategic focus on innovation	Read (2000), Hamil (2007), Skarzynski and Gibson (2008)
Empowerment enhancing strategies	Psychological empowerment	Spreitzer et al. (1997), Lynch (2007)
	Employee involvement practices	Subramony (2009)
	Employee voice	Black and Lynch (2005)
	Decentralised decision-making	Ramstad (2009)
	Organic structures	Hage (1999), Damampour (1991)
	Flexible structures	Read (2000), Conway and McMackin, (1997)
	Team working	Shipton et al. (2006), Read, (2000) Appelbaum (2000)
	Adaptive teams	Conway and McMackin (1997)
	Participative management style	McLeod and Clarke (2009)
Positive social interaction	External and internal networking	Read (2000)
	Extensive communication between the organisation and the environment	Slappendel (1996) Teece (1997, 2007)
	Customer/market focus	Read (2000)
	Building relationships between customers and suppliers	Slappendel(1996)
	Induction, appraisal, contingent reward	Shipton et al. (2006)
Learning strategies	Learning	Leavy and Jacobson (1997), Hage (1999) Lundvall (1998,2007), Cavagnou (2011)
	Workforce training	Lynch (2007)
	Employer guided training	Appelbaum (2000)
	Exploratory learning	Shipton et al. (2006)
	Knowledge management and development and technical knowledge resources	Read (2000), Hage (1999),Lam (2005)
	HR tools: recruitment, appraisal, contingent reward	Conway and McMackin (1997)
Bundles of practices	Synergistic effect of complementary bundles of practices	MacDuffie (1995) Ichniowski, Shaw and Prennushi (1997) Subramony (2009)

Management support for innovation

The importance of management support and a participatory management style features strongly in these reviews of the determinants of innovation (Conway and McMackin, 1997; Read, 2000; Shipton et al., 2006). As higher levels of employee engagement are also strongly linked to higher levels of innovation (Read, 2000; Shipton et al., 2006; McLeod and Clarke, 2009) it also requires management systems and work processes that are designed to enable employees to become deeply involved in the search for sources of higher performance and innovation.

Empowerment-enhancing strategies

Related to a participative style of management, is the empowerment of employees. Spreiter's studies (1997) on psychological empowerment show that empowerment is related to creativity. Spreitzer conceptualises empowerment as constituting four dimensions of employees' perceptions of their interaction with work; ability, autonomy, impact and significance, the first reflecting ability and the latter three reflecting opportunity which is afforded by empowerment strategies. Empowerment also reflects motivation and the feelings of being able, motivated and confident in undertaking challenges and projects, characteristics that are supported by good relationships and positive support from managers. Read (2000) emphasises empowered employees and flexible structures as supportive of innovation and Ramstad (2009) notes that employee involvement and participation in organisational planning and implementation is related to improved organisational outcomes (2008, p. 423). Employee empowerment is also an important innovation strategy in a number of studies undertaken by Black and Lynch which examined the workplace practices related to organisational performance outcomes (Black and Lynch, 2001, 2004; Lynch , 2007).

Positive social Interaction

Building relational capital and fostering positive relationships through extensive communications both with customers and internally with staff and managers are also notable strategies linked to innovation in the literature on organisational innovation (Slappendal, 1996; Read, 2000). Related to the development of good relationships are reward and appraisal systems which are seen to be beneficial and supportive of innovation efforts (Shipton et al., 2006).

Learning strategies

Learning is a central theme in the literature on organisational innovation where innovative organisations are viewed as dynamic living learning organisations (Leavy and Jacobson, 1997; Boud et al., 2006). As Cavagnou notes '*innovation reflects a process of learning*' (2011, p. 122). In determining the key capabilities required for innovation, Hage (1999) highlights learning or absorptive capacity and contends that, in essence, the learning organisation is the innovative organisation and both internal and external networks are critical in sustaining this learning capacity. It is learning on a scale described as productive reflection (Boud et al., 2006). Allied to the centrality of learning, many authors acknowledge the important of workforce training (Applebaum, 2000; Read, 2000; Shipton et al., 2006; Lynch, 2007) both as an important element in the suite of innovative work practices and as a central strategy in knowledge development and innovation performance.

Complementary bundles of practices

A related strand in the HR literature, which is relevant to organisational innovation, is the importance of complementary groups of employment practices. MacDuffie (1995) pointed to the importance of considering 'bundles' of innovative employment practices and showed that auto assembly plants with teamwork, job rotation and employee involvement had higher levels of labour productivity and lower levels of product defects. Other studies have shown that firms benefit little from implementing single practices at a time but realise the greatest benefits when clusters of coherent systems of innovative workplace practices are introduced (Ichniowski et al., 1997). More recently, in a meta-analysis of the relationship between HRM bundles of practices and firm performance, Subramony (2009) reveals that combining bundles of complementary practices have significantly larger magnitudes of effects than their constituent individual practices and are positively related to business outcomes. While these studies point to the importance of implementing synergistic bundles of innovative work practices in achieving better productivity and business performance, it is an important concept in examining the application of innovative work practices in the context of achieving innovation outcomes and will be incorporated in this research study.

The combined effect of bundles of practices as opposed to individual practices that make up these bundles can be explained by the synergistic effects that these practices have on each other. The sum of the bundles is greater than the parts because when two or more elements operate together to serve a common function, it is possible to conserve energy

and create synergy (Subramony, 2009). However, deciding which practices combine to have this effect is a key challenge.

In summary, noting the synergistic effects of bundles of practices, the key strategies and practices which are associated with innovation in these studies can be categorised under the following broad headings; management support for innovation, empowerment enhancing strategies; learning strategies and relational capital, building positive social relationships. The next section considers important new supporting evidence from the Irish National Workplace Survey of Employers (2009).

4.4 Evidence from National Workplace Survey of Employers (2009)

In assessing levels of organisational innovation in Irish organisations and workplaces the National Workplace Survey of Employers (2009) sought to test some of the findings from this literature review of the organisational innovation practices associated with innovation outcomes.[3] The findings from this large national survey of employers and managers, 3,027 in total, provide important new evidence supporting the link between empowerment enhancing strategies; relational capital, positive social relationships; and learning strategies and product, service and workplace innovation. The data from the survey came from a national postal and web survey of 2,668 privates sector and 359 public sector employers with response rates of 40 per cent and 57 per cent respectively. The fieldwork for the survey was carried out between February and June 2009. The evidence from this major national survey of public and private sector employers and managers adds considerably to the extant studies on organisational innovation and provides important new evidence on the association between particular strategies and innovation outcomes on which this study can draw.

The findings from the survey support the evidence from the organisational innovation literature reviewed in this chapter and report a strong association between particular combinations of innovative organisational practices and innovation outcomes in the form of product and service innovation. The survey findings also support the positive impact of introducing and implementing complementary bundles of practices. Table 4.2 drawn from

[3]The author was involved in overseeing the design of the survey questionnaire and in particular the preparation of questions in the Employer Survey which were designed to assess levels of innovative capacity in workplaces in Ireland. The author was the Director of the National Centre for Partnership and Performance (NCPP) which commissioned the Economic and Social Research Institute (ESRI) to undertake the survey. The fieldwork was conducted by Amárach Research Consulting.

the National Workplace Survey of Employers (2009) shows the association between different bundles of practices and innovation outcomes in both public and private sector organisations in Ireland. There is a clear association between the adoption of a combination of employment strategies and product, service and workplace innovation**.** Employers that combine all three bundles of strategies are most likely to have introduced new products (55 per cent), new or significantly improved services (74 per cent) or either new products or services (82 per cent) in the previous two years. They are also more likely to have introduced new workplace innovations (78 per cent).

In relation to product and service innovation, since some organisations produce products and some produce services, it is useful to examine whether the organisation introduced any new or significantly improved products or services in the last two years. Firms and organisations with a low adoption rate for all three bundles of practices were least likely to have introduced new products or services (45 per cent). Firms and organisations who adopt a combination of practices are more likely to have introduced new products or services than those adopting one type of practice only. Firms and organisations implementing empowerment-enhancing strategies only or learning/human capital development strategies only are considerably more likely than those who adopt neither of these sets of strategies, to have introduced new products or services (58 per cent to 60 per cent versus 45 per cent). But 72 per cent of those who combine the two have introduced new products or services. However, firms combining all three sets of strategies are most innovative in terms of products and services. Those who report high levels of these organisational innovation strategies, also report the introduction of new products and new services. Firms that combine particular empowerment-enhancing strategies and learning/human capital development strategies are 62% more likely to have introduced new products or services. However, those who adopt all three bundles of practices; empowerment-enhancing strategies, learning/training strategies and co-working/relationship building strategies in the private sector are *nearly three times more likely* to achieve these innovation outcomes than those who do not adopt such practices. In the public sector, organisations that combine bundles of practices in three categories, empowerment, learning/ human resource development and co-working are *over five times as likely* to have introduced new products or services in the previous two years.

The combination of practices is also associated with workplace innovation: 78 per cent of employers who combine all three practices introduced workplace innovations in the past two years, compared to 29 per cent of employers with a low adoption of all three practices. Again, the combination of practices is associated with a higher level of organisational innovation than Empowerment-enhancing strategies or Learning/Training strategies alone. This is summarized in Table 4.2.

Table 4.2: Evidence from the National Workplace Survey of Employers (2009) Innovation in Public and Private Sector Organisations where Employers adopt different Bundles of Employment Practices

	N= 3,027 *Cluster Label*	Product Innovation	Service Innovation	Product or Service Innovation	Workplace Innovation
1	Low adoption of all three practices	32%	34%	45%	29%
2	Empowerment-enhancing strategies	41%	43%	58%	50%
3	Learning/training strategies	44%	46%	60%	49%
4	Empowerment – enhancing and Learning /training strategies	48%	61%	72%	64%
5	Empowerment-enhancing, Learning/Training and Employee Involvement and Co-working /relationship building strategies	55%	74%	82%	78%
	Total	45%	55%	65%	57%

Source: Adapted from the National Workplace Survey of Employers (2009), weighted to be representative of organisations.

It is evident from this analysis that the findings on the links between organisational innovation strategies and innovation outcomes in the **National Workplace Survey of Employers** (2009) are significant. There is a consistent relationship between organisational innovation strategies and innovation outcomes in the form of product, service and workplace innovation. The association between bundles of practices in the three categories outlined, *empowerment-enhancing strategies*, *learning /human capital development strategies* and *co-working strategies* and innovation outcomes in the form of new products, services and workplace innovation is strong. This also supports the contention that 'bundles of practices' act in consort with each other and combined

together have a greater impact than when introduced individually (Pil and McDuffie 1996; Ichniowski et al.,, 1997; Subramony, 2009).

4.5 Developing Microfoundations: Convergence between Underlying Processes of Dynamic Capabilities and Organisational Innovation

From the analysis of the organisational innovation strategies which are linked to innovation outcomes, it appears that there is a strong similarity between these practices and processes and those which are seen as central to the development of dynamic capability (See Table 4.3). The similarity in the elements of the dynamic capabilities and organisational innovation literatures can be viewed as an important starting point in linking macro-level capabilities with micro-level organisational foundations and in filling the void identified by Abell and his colleagues (2008). This overlap can be understood as linking the strategic macro level dynamic capabilities for innovation with the human resource management strategies which build and develop these configurations at micro level. Organisational innovation strategies demonstrate how the human resources of the firm are refreshed, renewed (Ambrosini and Bowman, 2009) and reconfigured (Teece et al., 1997) and therefore begin to reflect how the microfoundations of dynamic capabilities can be built.

As demonstrated in the previous chapter, an analysis of the underlying developmental processes which support the development of dynamic capabilities for innovation suggest categorisation under three broad headings; purposeful collective learning processes; social interactions, and knowledge creation and knowledge management processes (Teece et al., 1997; Eisenhardt and Martin 2000; Zollo and Winter 2002; Kogut and Zander, 1995; Easterby –Smith et al., 2009). There is a strong convergence between these processes and those identified in this chapter drawn from the organisational innovation literature; management support for innovation; positive social interaction and learning/human capital development strategies (Hage 1999; Damampour 1991; Conway and McMackin 1997; Read, 2000; Lam 2005; Black and Lynch 2001. 2004; Lynch 2007; Lundvall, 1998, 2007; Appelbaum, 2000; McLeod and Clarke 2009). The exception is empowerment-enhancing strategies which are prominent in the literature on organisational innovation but do not feature in the dynamic capabilities literature. This broad convergence of evidence from the literature on dynamic capabilities and organisational innovation is further reinforced by the findings from the Irish National Workplace Survey of Employers (2009**)** which show that empowerment enhancing strategies, human capital development and co-working strategies were strongly associated with increased levels of innovation outcomes; product,

service and workplace innovation. This convergence of evidence and the findings from the National Workplace Survey of Employers (2009) are summarised in Table 4. 3.

A notable difference between strategies which are associated with innovation performance in the organisational innovation literature and the underlying processes which were identified as supporting the development of dynamic capabilities is that of empowerment of employees. While empowerment-enhancing strategies feature strongly in the organisational innovation literature (Read, 2000; Shipton et al., 2006; McLeod and Clarke, 2009), these strategies do not feature significantly in the dynamic capabilities literature. This illustrates further that the role of employees is largely ignored in the theory of dynamic capabilities. Teece and his colleagues (1997), in the original definition afford central importance to strategic management (Teece et al., 1997; Thompson, 2007). Yet as this study illustrates, a fundamental challenge in building dynamic change capability, relates to changing the collective behaviour of employees together with their associated routines, work patterns and daily activities.

It would seem therefore that in order to build dynamic capability for innovation and to implement the key underlying processes supporting the development of innovation i.e. purposeful collective learning, knowledge creation and management and social interaction, the following organisational innovation strategies are important; management support for innovation, empowerment enhancing strategies, positive social interaction strategies and learning/human capital development strategies. Strategies which are introduced in synergistic bundles are also more impactful than those which are introduced alone. In this study these are described as strategies rather than specific practices as they are understood as broad guiding principles or what Becker and Gerhart (1996) describe as the '*architecture*' of the '*architectural rubric*' (1996, p. 786) of the organisation's approach to developing innovation capability.

The convergence of evidence from the literature review of dynamic capabilities and organisational innovation and the findings from the National Workplace Survey of Employers (2009) are summarised in Table 4. 3.

Table 4.3: Convergence of Evidence: Dynamic Capabilities, Organisational Innovation and Evidence from the National Workplace Survey of Employers, 2009

	Dynamic capabilities	Organisational innovation	National Workplace Survey Employers(2009)
Management support for innovation	Reconfiguration of support activities of core processes Leveraging existing processes (Bowman and Ambrosini, 2003) Sensing; Seizing; Managing threats and Reconfiguration (Teece, 2007)	Encouraging risk-taking, Tolerating risk and failure, Encouraging new ideas Participative management style Visible leadership for innovation ; strategic focus on innovation (Hage 1999; Damampour 1991; Conway and McMackin 1997; Read, 2000; McLeod and Clarke 2009)	
Empowerment		Employee involvement practices Decentralised decision-making, Flexible structures, Participative management style (Damampour, 1991; Hage, 1999; Conway and MaMackin 1997; Read , 2000; Appelbaum, 2000; Black and Lynch, 2004; Shipton et al., 2006; Lynch, 2007; McLeod and Clarke, 2009; Subramony, 2009)	Information and consultation Employee involvement Employee discretion Work-life balance
Positive social interactions	Networking facilitates learning Positive social interaction and relationships amplify and develop new knowledge (Nonaka,1994; Kogut and Zander 1995; Nonaka, 1996; Lawson and Samson, 200; Teece, 2007; Argote et al., 2003).	External and internal networking Extensive communication between the organisation and the environment; Customer/market focus (Slappendel, 1996; Read, 2000; Shipton et al., 2006)	Networking Cross functional Working Teamworking Flexible structure
Learning	**Purposeful collective learning processes** Learning is collective and organisational; Learning processes are intrinsically social and collective;(Teece, 2007; Eisenhardt and Martin, 2000)	**Learning / Human capital Development** Workforce training, Employer guided training HR tools: Induction, appraisal, contingent reward (Hage, 1999; Leavy and Jacobson 1997; Conway and McMackin, 1997; Lundvall, 1998; Appelbaum, 2000; Read, 2000; Lam, 2005; Lynch, 2007)	**Human capital Development** Staff training and development Staff performance review , In-house dispute resolution Equality/diversity policy
Knowledge creation, sharing and management	Exploitation of existing knowledge; exploration of new knowledge, Creating new knowledge through *Doing, using and interacting* (Eisenhardt and Martin,2000; Prieto and Easterby-Smith, 2002; Argote et al., 2003; Lawson and Samson, 2001; Jenson et al., 2007)	Knowledge management and development , and technical knowledge resources (Hage 1999; Read 2000; Lam 2005)	

4.6 Understanding the Link between Organisational Innovation Strategies and Outcomes

As outlined in this chapter, there are a number of studies associating organisational innovation practices with positive innovation outcomes (Conway and McMackin 1997; Read, 2000; Shipton et al., 2006; McLeod and Clarke, 2009) and the findings from the National Workplace Survey of Employers (2009) provide new and important evidence which supports this association. However, analysis and understanding of the underlying causal relationships remains weak. In seeking to understand the organisational factors that lead to innovation outcomes, one is faced with the same challenges that govern much of the HR and HPWS studies. The underlying mechanisms explaining how organisational practises affect outcomes has not been well established either theoretically or physically (Becker and Gerhart, 1995; Guest, 2001, 2011; Boselie et al., 2005; Purcell and Hutchinson, 2007; Takeuchi et al., 2007; Heffernan et al., 2009). This is a persistent problem as Becker and Gerhart identified in 1996 *'the mechanisms by which human resource management decisions create and sustain value are complicated and not well understood* ' (1996, p. 780). Today there remains an '*explanatory void'* (Harney, 2009, p. 7) in HRM – performance research which does not explain sufficiently how and why certain strategies have particular effects.

Filling this explanatory void or finding the links in the causal chain (Purcell and Hutchinson, 2007) of the relationship between organisational strategies and performance outcomes requires considerable more research. There is a need to establish a causal explanation which links practices, people and performance (Guest, 2011). One of the reasons for the persistence of an explanatory gap in the relationship between strategies and performance is that the reactions of employees have been neglected in previous studies (Wall and Woods, 2005; Macky and Boxall, 2007; Harney, 2009; Guest, 2011). Because understanding workers' perceptions and actions are now seen as the key to understanding the link between strategies, practices and performance more surveys of employees are required (Purcell and Hutchinson 2007; Guest, 2011). A key objective of this study is to address this gap by focussing on employee responses and the next chapter will address literature from the employees' perspectives.

4.6.1 Organisational Innovation Strategies and Employee Outcomes

As a first step in addressing this explanatory gap between strategies and outcomes, this study will investigate whether organisational innovation strategies are linked to proximal employee outcomes such as job satisfaction, commitment and wellbeing (Wright and Gardner, 2003). Advocating for more research linked to proximal outcomes to better understand the relationship between strategies and performance, Guest advises that '*we would expect a stronger association between HRM and proximal rather than distal outcomes'* (2011, p. 10). The exploration of the link between strategies and employee outcomes proposed in this study is a first step in opening up understanding of the innovation black box or the explanatory gap between strategies and outcomes (Becker and Gerhart, 1995; Purcell and Hutchinson, 2007; Guest, 2001, 2011).

Firstly, the study will investigate the association between organisational innovation strategies and the employee outcome of commitment as high levels of commitment are particularly important in the process of creativity and innovation (Csikszentmihalyi, 1990; Amabile, 1993). Csikszentmihalyi's (1990) work on problem solving found that providing solutions to difficult and intractable problems requires high levels of commitment in the form of interest, curiosity and application; a state he called *'flow'* which is a highly motivated and excited state which leads to creativity and discovery. Investigating strategies related to high levels of employee commitment to their work and to the goals of the organisation, in particular innovation performance goals would be significant in the context of this exploration of the factors influencing organisational innovation. Commitment in this study will be measured by the degree to which the employees are willing to work hard for the organisation as well as their levels of organisational commitment and loyalty which is the degree to which the employees personally identify with the organisation and are committed to achieving its objectives (Moyday et al., 1979; Meyer and Allen, 1997).

Because of the centrality of employee commitment in determining performance, many authors describe the High Performance Work Systems (HPWS) model as a high commitment model (MacDuffie, 1995; Ichniowski et al., 1997). This is because organisational innovation strategies which are perceived by employees as supportive lead to high levels of employee commitment and improved performance (Blau, 1964; Takeuchi et al., 2009; Cavagnou, 2011). Strategies associated with the HPWS model; empowerment and communication, staffing, training and performance management appraisal and reward systems are

therefore also strongly associated with increasing employee commitment. (Applebaum, 2000; Combs et al., 2006; Takeuchi et al., 2007; Guthrie et al., 2009, 2011). More specifically, there are a number of recent studies linking empowerment strategies with increased employee commitment (Sarwar and Khalid, 2011; Ismail et al., 2011; Choong et al., 2012). Similarly, Ehrhardt et al. (2011) in a study exploring employee perceptions of training offered by the organisation found a positive relationship between employees' perceptions of training opportunities provided by their employers and organisational commitment.

Secondly the association between organisational innovation strategies and job satisfaction will be explored as high levels of job satisfaction enhance motivation and increase the likelihood that employees will give 'discretionary effort' to their work (Brown and Leigh, 1996; Neal and Griffin, 1999). Employees experiencing high levels of job satisfaction will also be more willing to collaborate with and assist and support their colleagues (Neal et al., 2005: Chadwick and Dabu, 2009). In addition, where the majority of employees experience job satisfaction, they will endorse rather than resist innovation and work collaboratively to implement as well as to generate creative ideas (Shipton et al., 2006). Investigating the association between organisational innovation strategies and job satisfaction is therefore significant in the context of this study which aims to identify and better understand the internal organisational dynamics which support innovation.

Thirdly, the study will investigate the link between organisational innovation strategies and measures that reflect employee wellbeing because of the importance of wellbeing and positive affective tone to creativity and innovation in the literature (James and James, 1989; Isaksen et al., 1998; Chadwick and Dabu, 2009). Empowerment is known to have beneficial effects on employee's wellbeing (Biron and Bamberge, 2011) and strategies which foster good workplace relationships are also positively related to employee wellbeing (Vanhala and Tuomi, 2003). Employee perceptions of support through training opportunities afforded by the organisation can also increase wellbeing (Ehrhardt et al. 2011). It is expected therefore that organisational innovation strategies such as the empowerment enhancing strategies, relational capital and opportunities for employer paid training will be strongly related to employee outcomes such as increased job satisfaction, commitment, and well- being.

4.6.2 Organisational Innovation Strategies and Organisational Outcomes

As well as investigating the association between strategies and employee outcomes, this study will also investigate the relationship between organisational innovation strategies and the organisational innovation outcomes of product, service and workplace innovation. Product and service innovation outcomes will be measured by whether the organisation introduced new products or new services in the past two years. These measures are adapted from Smith et al. (2005) who adapted them from Damanpour (1991). Regarding the outcome of workplace innovation, the National Workplace Surveys (2009) define workplace innovation outcomes as '*new ideas, processes or behaviours that lead to significant improvements in the way work was carried out'*. This definition of workplace innovation as an outcome reflects significant improvements in how work was carried out and was drawn from extensive work carried out in the National Centre for Partnership and Performance (NCPP) over a number of years. Investigating the association between organisational innovation strategies and workplace innovation is important as workplace innovation requires changing practices and routines in order to bring about improvements in the way work is carried out. It therefore reflects elements of innovation capability in action. It is difficult to manage and sustain creativity as it requires a shift in attitudes and movement away from what is familiar to that which is unknown (Ford, 1996; Ekvall, 1997; Cavagnou, 2011). As workplace innovation involves the introduction of innovations in the workplace such as new ideas, processes or behaviours that lead to significant improvements in the way work is carried out, it demonstrates the ability to change habitual routines and behaviours and therefore reflects the presence of dynamic capability for change and innovation. Investigating the association between organisational innovation strategies and workplace innovation therefore will help provide some of the answers to the challenges of disturbing habitual behaviours in favour of more creative actions and routines and therefore to the challenge of developing and embedding the microfoundations of dynamic capability for innovation in the organisation.

In attempting to bridge the explanatory gap between strategies and innovation outcomes, therefore, this study proposes to investigate the association between organisational innovation strategies and the employee outcomes of commitment, job satisfaction and wellbeing. It will also investigate the association between these organisational innovation strategies and product, service and workplace innovation and ultimately will seek to explore the relationship between employee outcomes and organisational outcomes.

However, in further addressing the explanatory gap between strategies and outcomes, some studies have begun to explore potential mediators in the relationship between HR practices and employee behaviours. In particular, organisational climate, variously described as employee climate (Takeuchi et al., 2009), creativity climate (Heffernan et al., 2009), relational climate or socio-cognitive environment (Mossholder et al., 2011) is increasingly seen as a powerful social mechanism through which HR systems influence employee perceptions, behaviours and values. It is an important element in understanding the impact of organisational HR and HPWS strategies on employee behaviours and outcomes such as increased commitment, job satisfaction and motivation, helping behaviours and increased effort arising from social exchange (Rousseau, 1995; Takeuchi et al., 2009; Mossholder et al., 2011). The next chapter will review the literature on innovation climate in seeking to understand the impact of particular organisational innovation interventions on employees, and to provide more explanation on how and why particular practices and approaches lead to particular outcomes.

4.7 Proposed Research Investigation: Organisational Innovation Strategies and Outcomes to be Investigated in this Study

So far the literature reviewed in this study has linked dynamic capability theory with the human resource management field of organisational innovation. In this chapter, the study has identified particular organisational innovation strategies as important areas of investigation in understanding the dynamics of innovation in organisations. While recognising that there are a number of organisational innovation strategies and practices associated with innovation outcomes in the literature, this review has identified the following organisational innovation strategies as important areas of investigation for this research;

- Empowerment enhancing strategies (Conway and McMackin, 1997; Read, 2000; Black and Lynch, 2004; Shipton et al., 2006; McLeod and Clarke, 2009)
- Relational capital, positive social interaction (Damampour 1991; Conway and McMackin, 1997; Read, 2000; Skarzynski and Gibson, 2008)
- Learning strategies (Leavy and Jacobson 1997; Lundvall, 1998, 2007; Read, 2000; Shipton et al., 2006)

The research investigation will therefore examine the association between these organisational innovation strategies and both organisational innovation outcomes and employee outcomes. The empowerment-enhancing strategies which will be investigated in this study are frequency of communication and levels of consultation of employees. Relational capital will be investigated by assessing the quality of relationships between management and staff and the quality of relationships between staff members. Learning will be investigated by the degree to which employees have received any education or training paid for by their employer over the past two years. In linking these organisational innovation strategies to outcomes, the investigation will include organisational outcomes such as the introduction of new products and services and new workplace innovation processes and employee outcomes in the form of commitment, job satisfaction and wellbeing.

4.8 Summary

This chapter explored the literature on organisational innovation in order to understand the challenge of building dynamic capability for innovation. It examined a number of studies which analyse the strategies associated with successful innovation in organisations and identified the organisational innovation strategies that are particularly significant determinants of innovation. The findings from the National Workplace Survey of Employers (2009) also provide new and important evidence which supports the effects of the following organisational innovation strategies: empowerment enhancing strategies (Read, 2000; Black and Lynch, 2004; Shipton et al., 2006); relational capital, positive social interaction (Damampour 1991; Conway and McMackin, 1997; Skarzynski and Gibson, 2008); and learning strategies (Leavy and Jacobson 1997; Lundvall, 1998, 2007; Read, 2000; Shipton et al., 2006). The research investigation will therefore examine the association between these organisational innovation strategies and innovation outcomes.

A synthesis of the analysis also found a strong convergence between the key practices and strategies which are associated with increased innovation performance drawn from the literature on organisational innovation and the literature on dynamic capabilities and these were summarised in Table 4.2. This convergence is important in the context of understanding and developing the microfoundations of dynamic capability for innovation. Finally, in considering the HR strategies-performance link challenge, climate is identified as a potentially important element in understanding the impact of organisational HR strategies on employee behaviours and outcomes (Rousseau, 1995; Takeuchi et al., 2009;

Mossholder et al., 2011). The next chapter will therefore review the literature on innovation climate with a particular focus on employees in order to better understand why and how particular organisational innovation strategies lead to greater innovation outcomes.

Chapter Five: Innovation Climate: Employee Perspectives

5.1 Introduction

While the previous chapter focused on the strategies that can be deployed by managers in an organisation to bring about innovation, the focus of this chapter is on employees. It explores how innovation climate, which reflects employees' perceptions and feelings, can lead to a better understanding of why and how particular organisational innovation strategies lead to innovation outcomes. In addressing the challenge of building dynamic capability for innovation, the chapter examines the role of innovation climate in building and developing the microfoundations (Teece et al., 2007; Abell, 2008; Felin et al., forthcoming) of dynamic capability for innovation. Because climate is viewed as a mediating influence between organisational practices and employee behaviours (Ekvall, 1996; West and Richter, 2007; Takeuchi et al., 2009), it may provide important insights into how to influence employee behaviour and develop dynamic capabilities for innovation.

This chapter covers three broad areas. Firstly it explores the role of individual employees in understanding the dynamics of creativity and innovation in organisations. The investigation of creativity at individual level highlights the challenges of creativity in organisations. The focus on the individual at micro level, echoes Abell and his colleagues' observation that '*there are no mechanisms that work solely on a macro-level, directly connecting routines and capabilities to firm-level outcomes'* (Abell et al., 2008, p. 489). Looking at creativity from the perspective of individuals also raises the issue of distinguishing between creativity and innovation. Secondly, the chapter reviews literature on innovation climate in seeking to identify the key dimensions of a climate for innovation. It explores recent studies on climate as a mediator through which HR systems influence employee perceptions and behaviours (Takeuchi et al., 2009; Mossholder et al., 2011). It examines literature on the many dimensions of a climate for creativity and innovation and aims to rationalise these elements in order to identify its core dimensions and develop an index for measuring innovation climate. Thirdly, the chapter considers how the integration of literatures on organisational innovation, innovation climate and dynamic capabilities create a better understanding of the underpinning microfoundations of dynamic capabilities.

5.2 The Importance of Exploring the Responses of Employees

While the previous chapter demonstrated that there are a number of studies associating organisational innovation and HR practices with positive innovation outcomes (Shipton et al., 2006; Slappendel 1997; Hage, 1999), it also acknowledged that analysis and understanding of the causal relationships between organisational strategies and innovation outcomes remains weak (Becker and Gerhart, 1995; Guest, 2001, 2011; Takeuchi et al., 2007). While these strategies are meant to work by changing employee behaviour in ways that increase productivity and add-value, ironically the reactions of employees have been neglected in research (Macky and Boxall, 2007; Purcell and Hutchinson, 2007; Harney, 2009). Explaining the underlying causal mechanisms requires an exploration of the dimensions and challenges of creativity at the level of the individual employee together with the interaction of the individual with the organisation (Woodman et al., 1993). It suggests a bottom-up perspective in understanding innovation (Anderson, 2008). It also requires an understanding of the organisational climate and underlying conditions within the organisation which support creativity. In order to understand how to develop capability for creativity and innovation at macro or collective level therefore, it is important first to understand creativity at the level of the individual. As Felin and Foss note *'to explain… collective structures, one must understand the underlying abilities, actions, choices and motivation of the individuals involved*' (2005, p. 448). This study will therefore focus on employees' perceptions and responses to offer an authentic account of the impact of organisational innovation strategies on employees themselves, their attitudes, dispositions and motivation and how this impacts on their innovative performance.

5.2.1 The Challenge of Creativity in Organisations

Examining the role of individual employees, illustrates how creative thinking and behaviour are difficult to orchestrate and manage in organisations. This is because people will tend to abandon creative actions in favour of habitual routines (Ford, 1996) as creative endeavors require a shift in perceptions and an abandonment of the familiar and the habitual in favour of the unknown and the less certain (Ekvall, 1997). This creates a continuous and ever daunting challenge for organisations as Ford explains; '*even in circumstances that favour creative action, people will likely choose familiar behavioural options that are relatively more attractive based on their past success, relative ease and certainty*' (1996, p. 1116). According to Ford, adherence to habitual routines inhibits creativity as it narrows the range of behaviours and opportunities. If adherence to habitual routines and behaviour

is the default position at the level of the individual, then creative actions are not likely to emerge unless they are expected to present personal consequences that are more desirable than familiar behaviours (Ford and Gioia, 1995; Cavagnou, 2011).

In exploring this challenge, there are a number of theoretical models that have guided the development of organisational creativity and the social and contextual influences on employee creativity in organisations. Woodman and colleagues (1993) stress the interactionist perspective of organisational creativity, which is premised on the idea that while creativity is an individual level phenomenon, it is very much affected by situational and organizational factors. The authors stress that it is at the level of interaction between the individual and the contextual factors surrounding that individual that creative performance is either facilitated or hindered. In developing the interactionist perspective further and in attempting to identify organizational level strategies to effect individual creative behaviour, Mumford (2000) suggests that creating the conditions for creativity to occur in organizations, requires particular and deliberate strategies and incentives to support individual creative effort. The types of strategies that might enhance individual creativity would be, for example, incentives for ongoing knowledge development, diversity in project assignment and providing multiple career paths for advancement. Cavagnou (2011) stresses that such incentives and rewards are central to generating innovation behaviour and changing habits from those that hinder innovation to those that lead to innovation. Rewards play an important role in the motivation to innovate as innovation makes difficult cognitive demands on workers (2011, p. 115).

Amabile (1993, 1996) is less convinced by the interactionist perspective and her model of creativity looks at individual motivation and what motivates employees to be creative in organisational settings. Amabile distinguishes between intrinsic motivators that are an endogenous part of a person's engagement in an activity, and extrinsic motivators. Examples of intrinsic motivators are self-determination, competence challenge, task involvement, curiosity, enjoyment and interest (Amabile, 1993). Extrinsic motivation typically would come from the organisational and human resource management strategies and incentives that encourage and reward particular behaviours orientated towards innovation and creativity. In the main, according to Amabile, motivation for creativity is governed by intrinsic motivation but certain extrinsic motivators can also have a positive affect (Amabile, 1993). Ford (1996) extended Amabile's model by emphasising the importance of sense-making in intrinsic motivation but also specifying the multiple domains

which govern creative and habitual actions. The challenge for organisations he suggests is to firstly identify the individual attributes that facilitate creativity and to empower these individual processes across these multiple domains in order to '*facilitate creative action while holding the temptations that draw people towards habitual responses at bay*' (Ford, 1996, p. 1136). This approach is supported by Askanasy and Ashton-James (2007) who contend that in order to understand creativity at the level of the organisation; one must take a bottom-up approach and begin with understanding the dynamics of creativity at the level of the individual.

In his model of individual and domain level creativity, Ford, applying a bottom-up approach, delineates the individual attributes that facilitate creativity, those that constrain creativity, those that facilitate habits and those that constrain habits. Those that facilitate individual creative action are problem-solving orientation, creativity, independence and achievement and those that constrain creative action are routine or automatic problem-solving orientation, security, lack of confidence, low social competence, lack of divergent expertise and lack of divergent thinking (Ford 1996, p. 1118). The organisational settings which support creativity are simply those settings or domains where the facilitators of individual creative actions are supported and the inhibitors of creative actions are constrained. Therefore the domains in which creativity is likely to occur are those where creative actions are rewarded, individuals are confident in their creative ability, show interest and passion and display divergent thinking and associational ability (Ford 1996, p. 1118). These domains are reflective of Amabile's later revised theory of extrinsic motivators which she claims influence the individual's intrinsic motivation and create an environment conducive to creativity (Amabile, 1996).

Understanding the challenge of creativity at the level of the individual and the individual's natural tendency towards habitual routines (Ford, 1996) crystallizes the challenge of organisational creativity. It also creates a bridge to dynamic capability through which the organisation can address this challenge and systematically generate behaviours which refresh operating routines in pursuit of improved creativity (Zollo and Winter, 2002). The presence of dynamic capability can be viewed as a systematic and persistent (Helfat and Peteraf, 2009) drive to overcome individual habitual behaviours and routines and to widen the range of opportunities and possibilities, thus creating a climate for continuous change and innovation, a process of continuous morphing (Rindova and Kotha, 2001).

5.2.2 Distinguishing between Creativity and Innovation

The exploration of individual level creativity has led some to draw a distinction between creativity and innovation (West et al., 2004; Lichtenthaler and Lichtenthaler, 2009). Creativity is sometimes seen as an individual endeavour which relates primarily to the initial stages of innovation, while innovation is a group activity requiring integration and co-ordination (West et al., 2004). Some authors therefore distinguish between creativity and innovation and view creativity as an important dimension of the initiation or idea generating and learning phases of innovation but not necessarily with the later phases of the process (McAdam and McClelland, 2002; Shipton et al., 2006; West and Richter, 2007). These authors would argue that creativity is the development of new ideas, while innovation is the application of these new ideas in practice; '*creativity is the development of ideas, while innovation is the development and application of these ideas in practice'* (West et al., 2004, p. 271). Innovative capacity in an organisation is also seen as matching the results of individual creative activity or inventions with the context of their final market (Lichtenthaler and Lichtenthaler, 2009). Creativity might therefore be viewed as part of the innovation process and is concerned with the process of thinking about new things, while innovation is about doing new things (West and Richter, 2007). Thus, in order to operationalise the processes of creativity and innovation, West et al. (2004) differentiate between idea generation and idea implementation where creativity describes the former and innovation the latter. Similarly for Lichtenthaler and Lichtenthaler (2009), inventive or creative capacity, the ability to explore and generate new knowledge is but one aspect of innovative capacity.

This view of creativity as primarily a key input into the idea generation phase of the innovation process is strongly contested by Ford (1996) who argues that these concepts are unnecessarily limiting. He argues that many of the empirical studies on innovation which concentrate mainly on the adoption and diffusion stages of innovation overlook the influences of creativity across many stages of the process of innovation. For Ford, creativity is required at every stage of the process from design, through production and implementation to services and marketing. He argues that it is creative acts that are the '*definitive episodes'* (Ford, 1996, p. 1113) that distinguish successful innovations from more mundane efforts. For Ekvall, (1996, 1997) also there are no strict demarcation lines drawn between the phases of creativity and innovation and an understanding of creativity is required at each stage of the innovation process '*to understand innovation we must understand creativity, its processes and conditions, as well as the processes that are*

involved in the transformation of ideas into innovations' (Ekvall, 1997, p. 195). This broader interpretation of the importance of creativity throughout the innovation process is also supported by Zhou and George (2003), who contend that creativity is essential to each stage of the innovation process. It is sometimes the case that the later stages of innovation require the greatest levels of creativity as at this stage new opportunities might emerge that are far more radical or ground-breaking than the original ideas offered. Zhang and Begley (2011), in reviewing innovation climate across countries and cultures, note that the terms creativity and innovation are so closely linked that it is best to use them interchangeably.

Equally because of the interactionist perspective (Woodman et al., 1993) and the importance of contextual factors, creativity is likely to be a collective and group activity as well as that emanating from individuals. Because of emotional and cognitive contagion (Barsade, 2002), group and organisational level creativity can reflect a synergy of many inter-related and indistinguishable inputs. This interdependence of creativity and innovation also accords with the broadest possible definition of creativity as '*making new and valuable connections*' (Ekvall, 1997, p. 195) which is similar to '*newness'* or '*novelty'* as the key distinguishing feature of organisational innovation (Zaltman et al., 1973) as discussed in the previous chapter.

A more holistic and integrated view of creativity and innovation is required in exploring dynamic capability for innovation. In seeking to understand dynamic capability and to operationalise capability for innovation, it is to be expected that the drive to sustain creativity would be required throughout the process of innovation in order to overcome the impetus to revert to habitual routines. If creative actions will be forsaken as long as habitual actions remain more attractive (Ford, 1996; Ekvall, 1997; Zhou and George, 2003) then the planned and intentional drive to maintain creativity and to change and refresh routines is an integral dimension of the challenge in developing and maintaining dynamic capability for innovation at every stage of the process (Ambrosini and Bowman, 2009). Creativity and innovation are inextricably linked and interdependent and this study views creativity as an integral part of each stage of the innovation process.

5.3 Organisational Climate

In analysing the role and perceptions of employees and attempting to bridge the explanatory gap (Harney, 2009) between strategies and performance, this section reviews studies on climate which is increasingly seen as an important element in understanding the impact of organisational HR strategies on employee behaviours and outcomes (Takeuchi et al., 2009; Mossholder et al., 2011). This exploration of climate, which reflects employees' perceptions and feelings, seeks to develop a better understanding of why and how particular organisational innovation strategies lead to increased innovation outcomes.

5.3.1 Climate as a Mediator

Climate is viewed as a mediating influence between organisational practices and employee behaviours (Ekvall, 1996; West and Richter, 2007) because it is related to employee outcomes such as increased commitment, job satisfaction, motivation, helping behaviours and increased effort arising from social exchange (Blau, 1964; Rousseau, 1995; Mossholder et al., 2011). In exploring climate and the impact on employees, Takeuchi, Chen and Lepak (2009) undertook a cross level analysis which examined the relationships between the implementation of High Performance Work Practices (HPWP) at establishment level, organisational climate also at establishment level and employee attitudes at the level of the individual. The findings suggest that concern for employee climate acts as an important mediator between organisational practices, in this case HPWS practices and employee attitudes leading to increased job satisfaction and affective commitment (Takeuchi et al., 2009). The authors of an earlier study (Takeuchi, Wang, Lepak and Takeuchi, 2007) examined a related mediating factor, that of social exchange. Social exchange has been described as '*favours that create diffuse future obligations, not precisely specified ones, and the nature of the return cannot be bargained about but must be left to the discretion of the one who makes it* ' (Blau, 1964, p. 93). In a recent study of the top 2000 firms in Ireland, Heffernan, Harney, Cafferky and Dundon (2009) found a significant positive relationship between HRM systems, creativity climate and organisational performance outcomes. When HR practices are interpreted by employees as expressing appreciation, investment and recognition, then employees see themselves in a social exchange. Thus, HPWS is positively related to social exchange and because employees feel valued, they are motivated to contribute more discretionary effort and this in turn leads to improved performance (Takeuchi et al., 2007).

Mossholder et al. (2011) also examined the links between human resource systems, climate and employee helping behaviours. They propose that HR systems serve as a broad-based influence on helping within organisations, but stress that it is the intermediate socio-cognitive environments, which they call relational climates, which influence most strongly the behaviours of employees and in this case the degree to which they help each other. Relational climate refers to the shared employee perceptions and appraisals of policies, practices and strategies which affect interpersonal relationships in certain settings (Mossholder et al., 2011). HR systems influence employee climate perceptions by symbolically framing (Rousseau, 1995) and communicating key organisational values and behaviours. Where practices and strategies that are employed by management result in a positive relational climate, it is a reflection that such actions are seen by employees as exhibiting managerial competence, reducing perceptions of fear or threat and seen to be in the worker's interest (Macky and Boxall, 2007).

5.3.2 Definitions and Understanding

While there is still considerable confusion as to the precise definition of organisational climate, most authors agree that climate is about perceptions, how workers feel about their organisation (Dawson et al., 2008; King et al., 2007; West and Richter, 2007). It constitutes the recurring patterns of behaviours, attitudes and feelings that characterise life in an organisation (Isaksen et al., 1998). At the level of the individual it is referred to as psychological climate and when consensus or shared perceptions about organisational characteristics emerge among members of an organisation, an organisational climate may be formed (King et al., 2007). It constitutes the collective mood of the members of the organisation towards their jobs, their managers and the organisation, together with its policies and strategies (Ashkanasy and Ashton-James, 2007). Individual perceptions of work environment evoke emotions and feelings of wellbeing as well as assessments of congruence with individual attributes goals and meaning (Ekvall, 1996).

While climate is about employees' perceptions and feelings, it is also about employees' behaviour (Schneider, 2000). How employees perceive their organisation and how they feel about its structures, characteristics and strategies affects how they perform and behave. By influencing individual psychological processes such as motivation, learning, interacting and knowledge sharing, climate can exert influence on organisational processes such as problem-solving, communications, co-ordination, and organisational learning (Ekvall, 1996) thus influencing creativity and innovation. It can be behaviourally oriented

towards particular organisational goals. As well as directly influencing behaviours, because climate measures assess feelings and perceptions, it can help provide an authentic assessment of employees' dispositions and orientations to change and innovation.

There is some confusion between climate and culture and some authors in their understanding of climate include the values, norms and belief systems of their organisation (Payne and Pugh, 1976). These definitions thereby equate climate with culture. However, more recently, climate is increasingly seen as distinct from culture (West and Richter, 2007). While culture refers to the deeper more persistent values, norms and beliefs within the organisation over time (Isaksen et al., 1998), climate is more tangible and relates to the attitudes, feelings and behaviours of the employees. Climate is essentially an emotional phenomenon where culture is a more stable construct embodying the embedded beliefs and values of the organisation (Ashkanasy and Ashton-James, 2007). Climate is therefore of more relevance in the exploration of employees' role in innovation as it reflects their perceptions, emotions and dispositions, which directly affect their behaviour. The differences between climate and culture are described by West and Richter (2007) in terms of an insider's / outsider's perspective. Manifestations of culture can include hierarchy, pay levels, job descriptions, informal practices and norms, espoused values and rituals, stories, jokes and jargon and physical environment (West and Richter, 2007). Climate on the other hand is more intimate and personal and is a localised phenomenon (Hunter et al., 2007). It is how the insiders actually feel and perceive their organisation and its practices, structures, policies and relationships, as King et al. observe *'perceptually-based descriptions of relevant organisational features, events, practices and processes' (*2007, p. 633).

To address the problem of imprecise definition and inconsistencies in relation to boundaries and dimensions and in particular the difficulties that these create in measuring organisational climate, Patterson et al. (2005) attempted to develop and validate a robust organisational climate measure (OCM). This measure consisted of seventeen scales divided into four quadrants. The four overarching quadrants are; human relations, internal process, open systems and rational goal and the scales measure degrees of autonomy, integration, involvement, supervisory support, training, welfare, formalisation, tradition, innovation and flexibility, outward focus, reflexivity, clarity of organisational goals, efficiency, effort, performance feedback, pressure to produce, and quality (Patterson et al., 2005). Moving from this generic model to the specific, Schneider proposes that organisational climate must be understood by using more facet-specific dimensions

(Schneider, 1990). One can consider for example a climate for safety, a climate for customer service and in the context of this study a climate for creativity and innovation. The dimensions of a climate for innovation will be considered in the following section.

5.3.3 Evolving Dimensions of a Climate for Innovation

As research in the area of climate generally, and climate for innovation in particular, has grown exponentially over the past two decades, so too has the list of its possible dimensions. A summary of some of the earlier studies will illustrate how diverse and extensive are the possible dimensions of a climate for innovation. Campbell et al. (1970) emphasise individual autonomy, degree of imposed structure, reward orientation and consideration, warmth and support. James and James, (1989) describe four dimensions under the headings of role stress and lack of harmony, job challenge and autonomy, leadership facilitation and work group co-operation, friendliness and warmth. Other dimensions include leaders psychological distance and open-mindedness (Payne and Mansfield, 1978), managerial trust and consideration (Gavin and Howe, 1975), communication flow (Drexler, 1977), risk- orientation (Lawler et al., 1974), service quality (Schneider et al., 1980) and equity (James, 1982). Summarising these factors, West (1990) proposes a four-factor model of group work innovation under the broad headings of vision, participative safety, task orientation and support for innovation. Amabile (1993), in developing the theory of intrinsic motivation for innovation proposed eight dimensions as follows: group support, challenging work, organisational encouragement, supervisory encouragement, organisational impediments, freedom, workload pressure, and sufficient resources. Lansisalmi and Kivimaki (1999) in a summary of the key dimensions of innovation climate up to the end of the last century, emphasise well-defined goals, feedback, effective extraorganisational and intraorganisational communication and crossfertilisation of ideas and autonomy.

In exploring the facet-specific dimensions of a climate for creativity, Hunter et al. (2007) conducted a review of the available taxonomies on creativity climate variables. They found that more than ninety percent of the variables appearing in prior taxonomies could be accounted for by a fourteen dimension model that included: (1) positive peer group, (2) positive supervisory relationships, (3) resources, (4) challenge, (5) mission clarity, (6) autonomy, (7) positive interpersonal exchange, (8) intellectual stimulation, (9) top management support, (10) reward orientation, (11) flexibility and risk-taking, (12) product emphasis, (13) participation and (14) organisational integration. While this review is useful

and necessary, it still presents a long and daunting list on which to assess and make judgements on innovation climate.

More recently, West and Richter (2007) propose that the aspects of climate which most influence innovation and creativity are safe, positive unpressurised climate, job characteristics together with high work demands and extrinsic rewards. They also sight dual autonomy, degrees of structure, reward orientation, and consideration, warmth and support. An adaptation of the Patterson organisational climate measure OCM with a specific focus on innovation might isolate the quadrants of human relations and open systems (Patterson et al., 2005). The human relations quadrant measures autonomy, integration, involvement, supervisory support and training and the open systems quadrant includes scales which measure the degree of innovation and flexibility, outward focus and reflexivity.

Because of the proliferation of suggestions in the literature on what constitute a climate for innovation and the daunting list of dimensions that might be regarded as significant, there is a need to rationalise these elements in order to examine the real impact and significance of climate and this is undertaken in the next section.

5.4 Identifying the Core Dimensions of Innovation Climate

One way of narrowing the lens is to focus on what is meant by the perceptions and feelings of employees as there is general agreement that climate is about perceptions and feelings (Dawson et al., 2008; King et al., 2007; West and Richter, 2007). Focussing on perceptions affords a distinction between employee's perceptions and organisational strategies which are designed to influence those perceptions and therefore influence behaviour. For example, an organisational strategy to promote and provide for extensive training and up-skilling may have a positive effect on an organisational climate for innovation but in itself is not a dimension of climate. It can only be considered a dimension of climate if it is perceived by employees to support their wellbeing and if it reflects a positive disposition on behalf of the organisation. Thus typical climate questions would be whether 'people *are not afraid to take risks around here'* or '*employees feel free to express their ideas to bosses'* (Hunter et al., 2007, p. 70). The important principle in measuring climate is that climate dimensions relate specifically to questions of perceptions, feelings and emotions about the work environment rather than actual features of that work environment.

Another approach would be to examine Amabile's (1993) distinction between intrinsic and extrinsic motivators in determining climate measures. Intrinsic motivators arise from a person's feeling about the activity and the organisation while extrinsic motivators are external to the individual. However, Amabile (1996) also contends that extrinsic motivation can, under certain conditions, complement intrinsic motivation. Innovation climate can therefore be understood as the relationship between extrinsic and intrinsic motivators or the synergy between different policies and inputs and employee perceptions and awareness of such inputs. Measuring innovation climate provides evidence that organisational strategies are effective and are alive and enacted in the organisation as distinct from strategies and policies which are articulated but not real for employees (Anderson and West, 1998).

Using these criteria, distinguishing between organisational innovation strategies and employees perceptions of support for innovation and drawing on intrinsic/extrinsic motivators for innovation, it is proposed to rationalise the dimensions of climate into a number of broad themes and categories. It is suggested that the following six dimensions encompass the most important dimensions of climate based on the review of the literature. These six dimensions will inform the research on innovation climate in this study:

1. ***Positive relationships, affective tone,***
2. ***Encouragement and support from managers/supervisors***
3. ***External, outward focus, focus on customers***
4. ***Risk-taking and flexibility***
5. ***Challenging work , problem solving orientation***
6. ***Effective internal and external communication and speed of response***

A summary of these key dimensions of innovation climate is outlined in Table 5.1 below and these will be considered in the following section.

Table 5.1: Dimensions of Innovation Climate

Dimensions	Descriptors	Sample of Authors
1. Positive relationships and affective tone		
	Positive peer group	Hunter et al. (2007)
	Positive interpersonal exchange	
	Consideration, warmth and support	Campbell et al. (1970)
	Group work co-operation, friendliness and warmth	James and James (1989)
	More collaboration	Chadwick and Dabu (2009)
	Playfulness and humour	Isaksen et al. (1998)
	Trust and openness	Ekvall and Ryhammer (1999)
	Emotional safety	Claxton (1997)
		Anderson and West (1998)
	Thriving at work	Spreitzer and Sutcliffe (2007)
	More vigour	Seligman et al. (2005)
	More energy	Shirom (2007)
	Work group support	Amabile (1993)
	Reflexivity	Anderson and West (1998), West et al. (2004)
	Participative safety	Shipton et al. (2006)
	Wellbeing `	Patterson et al. (2005)
	Low stress	Lansisalmi and Kivimaki (1999), King et al. (2007)
	Positive supervisory relationships	Hunter et al. (2007)
	Top management support	
	Leaders facilitation and support	James and James (1989)
	Supervisory encouragement	Amabile (1993)
	Organisational encouragement	
	Supervisory support	Patterson et al. (2005), Oldham and Cummings (1996)
	Support for innovation	Anderson and West (1998)
	Creative actions are rewarded	Ford (1996)
	Idea support	Ekvall and Ryhammer (1999)
	Idea time , Cross-fertilization of ideas	Lansisalmi and Kivimaki (1999).
	Resources, Resource availability and Training	
2. External , outward focus /focus on customers		
	Outward focus	Patterson et al. (2005)
	External communication	Perry-Smith and Shalley (2003)
	External integration	Hunter et al. 2007
	Extra organisational networking	Lansisalmi and Kivimaki (1999).
	Diverse expertise	Ford (1996).
3. Risk-taking and flexibility		
	Flexibility and risk-taking	Hunter et al. (2007)
	Risk-taking	Ekvall and Ryhammer (1999), Ekvall (1997)
	Innovation and flexibility	Patterson et al. (2005)
	Risk-taking and new idea promotion	Kontoghiorghes et al. (2005)
4. Challenge/problem-solving orientation/sense-making		
	Challenge	Isaksen et al. (1998)
	Intellectual stimulation	Hunter et al. (2007)
		Oldham and Cummings (1996)
	Problem-solving, sense making	Ford (1996)
	Dynamism, new ways of doing things	Rice (2006)
	Role stress, job challenge	James and James (1989)
	Workload pressure	Amabile (1993)
	Task orientation	Anderson and West (1998)
	Well-defined goals	Lansisalmi and Kivimaki (1999).
4. Effective internal/external integration, responsiveness		
	Effective extraorganisational and intraorganisational communication	Lansisalmi and Kivimaki (1999).
	Outward focus and networking	Patterson et al. (2005)
	Open communication	Kontoghiorghes et al. (2005)
	Information sharing	Rice (2006)
	Collaborative idea flow and participative management	West and Richter (2007)
	Communication skills	Ford (1996).
	Feedback	Lansisalmi and Kivimaki (1999), Amabile (1993)

5.4.1 Positive Relationships, Affective Tone

The essence of climate is the perception of the employee on the extent to which the environment is personally beneficial and supportive of one's sense of wellbeing or detrimental or damaging to that person's wellbeing (Neal et al., 2005). A positive organisational climate is thought to enhance motivation and increase the likelihood that employees will give discretionary effort to their work (Brown and Leigh, 1996; Neal and Griffin, 1999) and will also be more willing to collaborate with and assist and support their colleagues (Neal et al. 2005; Chadwick and Dabu, 2009).

The importance of positive climate for creativity accords with the rapidly growing body of knowledge on positive psychology and its effects in the workplace. Positive emotions are associated with individual and group creativity (Isen, 2003). Isen and her colleagues argue that dopamine levels in the blood are increased as a result of positive emotions and its presence is responsible for more creative and flexible cognitions. It is suggested that elevated dopamine levels which result from positive emotions influence performance in a number of ways including improving episodic memory and creative problem-solving (Ashby et al., 1999). There is growing evidence from cognitive psychology that the generation of creative thought processes and cognitions occurs best when individuals feel safe, experience a positive environment and feel free from pressure (Claxton, 1998). George (1996) believes that a group's affective tone will determine how effective a group will be and that, in effect, groups and organisations with a high positive affective tone will be more creative. The evidence suggests that when individuals feel positive, they tend to connect and to integrate divergent stimulus material (West and Richter, 2007). This builds what Ashkanasy and Daus (2002) call a healthy emotional climate. Emotions are contagious. This is called '*emotional contagion*' (Barsade, 2002, p. 646) a process whereby a person or a group of people influence the emotions and behaviours of others through conscious and subconscious mechanisms. Positive emotional contagion influences co-operativeness and improves task performance. Positive emotions are necessary for group cohesiveness (Ashkanasy and Ashton-James, 2007) and positive emotions are a key ingredient in group effectiveness and satisfaction (George, 1996; Barsade, 2002). Thus positive emotions and group consideration, warmth and support are critical for creativity to flourish (Campbell et al., 1970; James and James, 1989).

Anderson and his colleagues describe this as participative safety (Anderson and West, 1998). There is emotional safety in relationships and because of these feelings of safety and trust, people can be open and frank with each other (Isaksen et al., 1998). There is sufficient support and trust in the group to allow members to open up and volunteer ideas and solutions however wild or random they may appear (Ekvall and Ryhammer, 1999). If individuals trust each other, they are more likely to share information freely, to admit mistakes, question assumptions and engage in debate (Edmundson, 1999). They are therefore able to draw on their collective knowledge and emotional resources to deal with the complexities, ambiguities and uncertainties of the innovation process. Such a relational climate (Mossholder et al., 2011) is sustained by dense social exchanges and interactions which create experiences of belonging and wellbeing. A further dimension of this positive climate is the presence of playfulness and humour (Isaksen et al., 1998). There is an absence of conflict and the atmosphere is relaxed and at times playful and light-hearted.

A further by-product of a positive and trusting environment is that it allows for '*reflexivity*' (West et al., 2004, p. 285) in an organisational setting. Reflexivity is a process which is more than mere reflection. It involves groups and team members reflecting on their work methods and adjusting and modifying them where necessary in a process of continuous improvement. It is a process of '*questioning, reviewing, evaluating, debating and adapting and hence, is more than merely reflecting on what has already taken place*' (MacCurtain et al., 2010, p. 221.).

5.4.1.1 Creativity and stress

Lansisalmi and Kivimaki (1999) explored the role of occupational stress as a potential determinant of innovative climate and found that high stress was associated with poor innovative climate. Stress seemed to influence innovative climate independently of other determinants of innovation (Lansisalmi and Kivimaki., 1999).

An organisational climate that makes risk-taking and failure less threatening and stressful is conducive to promoting creative behaviour while a climate where there is fear of failure and suspicion would hold back creative endeavours (Ekvall, 1997). Job demands and job stress have been shown to relate to exhaustion, decreased learning, and low job satisfaction (King et al., 2007). However, the creation and maintenance of innovative organisational climates may be an appropriate way to address the concerns associated with demanding work leading to stress (King et al., 2007). King and his colleagues argue that

'*organisations which create and maintain an innovative climate can alleviate a portion of the negative consequences of demanding work …. a climate for innovation may enable the employees to develop novel individual coping mechanisms or improved work-related processes that counteract the negative consequences of work demands'* (2007, p. 635). Organisations that support change initiatives and encourage the development of new ideas may be simultaneously empowering their workers to develop strategies for efficiencies and improvements which reduce workloads and therefore reduce associated stress levels.

Some authors, however, have suggested that there is also good stress at work and that there is a fine line between stress and challenge at work (Simmons and Nelson, 2007). A positive response to stress occurs if the outcomes are perceived as positive and if it is expected that the stressor will result in enhancing the wellbeing of the individual. Overwhelmingly however, it is perceived that responses to stress are negative and perceived by the individual to be either threatening or harmful. In this context, the resulting distress caused by stressors at work, will inhibit creativity (Shipton et al., 2006; King et al., 2007).

5.4.1.2 Thriving and vigour at work

The importance of positive emotions for creativity is further underlined when considering a dimension of positive emotions which is an essential component of dynamic capability for creativity and innovation that is thriving at work. Thriving is defined as '*the psychological state in which individuals experience a sense of vitality and learning at work'* (Spreitzer et al., 2005, p. 538). Thriving concerns individuals but it also concerns groups and organisations. Collective thriving is where a group or a unit is learning and energised (Spreitzer and Sutcliffe, 2007). These thriving groups build capabilities and new competencies from their learning and are more prepared to cope with uncertainty and unpredictable market conditions. As such collective thriving is at the core of organisational dynamic capability which builds collective capacity to cope with obstacles, challenges and setbacks and is optimistic, resilient and persistent. Spreitzer and Sutcliffe acknowledge this potential when they posit that '*learning inherent in thriving may lead to new behavioural routines and repertoires. This could enable increased capability to improvise or recombine competencies to solve new problems'* (Spreitzer and Sutcliffe, 2007, p. 82).

Related to the notion of thriving is that of vigour which refers to individuals feeling that they have an abundance of personal resources in the form of physical strength, emotional energy and cognitive alertness (Seligman et al., 2005). Employee's vigour can promote skill building and learning and the resources available to employees possessed with vigour, enable them to proactively manage and anticipate change (Shirom, 2007). Based on emotional and cognitive contagion, organisational vigour reflects the sum of individual employee's levels of vigour (Barsade, 2002). These organisations can then use these energetic resources in the pursuit of organisational effectiveness and in particular in building dynamic capability for change and innovation. It is expected that vigorous organisations would be highly innovative and that they would have the capability to proactively adjust to rapid change (Cross et al., 2003). Vigour and dynamism are closely related and understanding vigour and how it can be sustained in individuals and in organisations is one route to understanding the underlying processes and strategies which build dynamic capability. Importantly, vigour is strongly related to positive emotions and positive organisational climate. Positive emotions enhance activity and energy levels associated with vigour whereas negative emotions have the opposite effect by restricting activity levels (Shirom, 2007). In summary, positive relationships and affective tone are an important dimension of innovation climate.

5.4.2 Encouragement and Support from Managers/Supervisors

Aligned to the importance of positive affective tone is encouragement and support from managers (Amabile, 1993; Ford, 1996; Anderson and West, 1998; Ekvall and Ryhammer, 1999; Lansisalmi and Kivimaki, 1999; Kontoghiorghes et al., 2005; Hunter et al. 2007). Managerial encouragement and support is important because it provides tangible and local evidence that help people to believe that creative work is possible and valued. Oldham and Cummings (1996) in examining the link between personal characteristics for creativity, organisational contextual factors and innovative outcomes, found that employees exhibited higher levels of creativity when their supervisors were described as supportive and non-controlling. In a similar analysis, Rice (2005) found that contextual factors were more important in explaining employee creative behaviour than individual personal characteristics. The contextual factors identified as important, were supportive communication and a caring atmosphere in enhancing employee creativity.

The role of managers is critical also for motivation and according to Amabile (1993) this is becoming an increasingly complex task. In learning to foster synergy in the motivational systems of individuals and teams, managers require critical skills in selection, matching employees to tasks, designing work that optimizes intrinsic elements and identifying the extrinsic motivators that complement these intrinsic motivators rather than inhibiting them. In Ford's theory on habitual behaviour, managerial and supervisory proactivity and support for creativity is a critical element in creating a domain which nurtures creative pursuits (Ford, 1996). West et al. (2004) identify leadership as a critical component in their twelve-step guide to successfully managing innovative teams. The emotional intelligence of leaders is also an important dimension in managing the fundamental tension that is inherent in innovation and creativity in organisational settings; the tension between the need for order and controls in complex organisational situations and at the same the need for flexibility, openness and freedom to facilitate creativity (Zhou and George, 2003). Thus, encouragement from managers and supervisors is an important dimension of innovation climate.

5.4.3 External Focus/Focus on Customers and External Environment

In Patterson and his colleagues' exploration of climate dimensions, outward focus is a key dimension (Patterson et al., 2005, p. 386). Outward focus denotes the extent to which the organisation is responsive to the needs of the customer and the market in general. Effective external networking and communications are key to generating novel ideas but they are also critical further along the value chain of innovation as they can help garner support for the implementation of new ideas and bringing these ideas through to fruition (Ford, 1996). These practices also facilitate diversity and for many, diversity fuels innovation. In Damanpour's (1991) meta-analysis he concluded that external orientation and communication was more important for innovation than internal communication in organisations. Effective extra-organisational networking is also an important theme in Lansisalmi and Kivimaki (1999) and Perry-Smith and Shalley's (2003) exploration of the factors associated with innovation climate. External focus and a focus on the customer is therefore an important dimension of innovation climate.

5.4.4 Risk-taking and Flexibility

In a study on the relationship between organisational learning, adaptation, innovation and organisational performance, Kontoghiorghes and colleagues (2005) identified risk taking and new idea promotion as among the most important predictors. They found that the three most important learning organisation dimensions for change adaptation and quick product and service introduction were open communication and information sharing, risk taking and new idea promotion and resource availability. An interesting finding from this study was that the three strongest predictors of quick product or service introduction are identical to those of rapid change adaptation (Kontoghiorghes et al., 2005). Flexibility and risk-taking are also well represented in Hunter et al.'s (2007) summary of the general dimensions of innovation climate. It is defined in organisational terms as the '*perception that the organisation is willing to take risks and deal with uncertainty and ambiguity associated with creative endeavours*' (2007, p. 74). Thus risk-taking and flexibility are important dimensions of innovation climate.

5.4.5 Challenging Work/Problem-solving Orientation

Hunter et al. (2007) in a meta-analysis of 42 prior studies assessed the relationships between climate dimensions and indices of creative performance. They found that positive collegial exchange together with challenge and intellectual stimulation produced particularly strong relationships. A work environment that presents people with meaningful and challenging work that stimulates thinking and interaction and exchange with colleagues is critical for innovation and creativity (West, 2004). Problem-solving and sense–making are important elements in Ford's model of creativity. In dynamic environments where innovation is required, problems are complex and open-ended presenting challenges which require individuals to respond who are '*personally interested*' (Ford, 1996, p. 1120) and intrinsically motivated. As Amabile explains, 'a *high level of novelty output requires a high degree of intrinsic motivation'* (1993, p. 197). Challenge and problem-solving orientation are therefore related to motivation for creativity because in a climate where the challenges are high, people are intrinsically motivated to make a contribution to the success of the organisation (Isaksen et al., 1998).

There is evidence that work demands and challenges are positively related to innovation (Anderson and West, 1998) though it is important to note that this may depend on the degree of demands (Amabile et al., 1996). In their study on the links between personal and contextual factors at work, Oldham and Cummings (1996) showed that employees who had

appropriate creativity–level personal characteristics produced their most creative work when they worked on complex challenging jobs and were supervised in a supportive non-controlling way. In Hunter and his colleagues' (2007) meta-analysis of climate dimensions, they identified the climate dimensions that were most important and found that challenge and intellectual stimulation were deemed to be one of the most important dimensions together with strong relationships and positive collegial exchange.

A further possibility suggested by King and his colleagues (2007), is that challenging work demands and work pressure could be positively related to innovation but negatively related to innovation climate for innovation. There may be situations where organisations that continuously produce new products and provide new services demand a lot from their employees but do not allow for deviations in how this demanding schedule of productivity and innovation is delivered (King et al., 2007). On the other hand, organisations that support flexibility, development of new ideas and deviation from routines, may be enabling their workers to develop new working methods and strategies for improvements which reduce workloads. Challenging work and problem-solving orientation are therefore considered important dimensions of innovation climate.

5.4.6 Effective Internal and External Communication

As discussed previously, Kontoghiorghes and his colleagues (2005) identified open communication and information sharing, among the top three strongest predictors of adaptation to change and innovation in their analysis of learning organisations. Complementing these findings, Rice in her study of Egyptian employees, found that '*responsibility to share information*' (2006, p. 239) was the most important independent variable contributing to employee creative behaviour. Hunter et al. (2007) emphasise clear, open and effective communication between peers, supervisors and subordinates as an important dimension of innovation climate, while West and Richter (2009) cite 'collaborative *idea flow across the organisation and participative management and decision-making*' (West and Richter, 2007, p. 228) as important elements stimulating organisational innovation. In their study of the factors associated with innovation climate while their particular interest was in the role of stress, Lansisalmi and Kivimaki (1999) found that communications were positively related to innovation climate, together with goal clarity, feedback and autonomy, while stress had a negative association. These conditions are what Isaksen and colleagues (1998) call dynamism or liveliness where there is flux and change and open communications facilitate innovation and even create excitement and

energy. Conversely, conditions that restrict open and free communications restrict creativity because new ideas and new constructs come into being when knowledge and experience from different domains meet (Ford, 1997; Ekvall, 1997). The encouragement of good communication and networking between teams is a critical element in the innovation process in West and his colleagues' (2004) twelve step guide to developing innovative teams. According to the authors, this is necessary particularly to overcome rivalry between groups and inter group dysfunctionality which is often prevalent in large corporate settings.

Both internal and external integration and strong communications are enabling responsiveness and driving the innovation process in order to create products and services that match future customer expectations (Iansiti and Clark, 1994). In summary, effective internal integration and communications are important dimensions of innovation climate.

In summary therefore, it is proposed that the following six dimensions encompass the key and critical dimensions of innovation climate: *Positive relationships, affective tone; Encouragement and support from managers/supervisors; External, outward focus, focus on customers; Risk-taking and flexibility*; *Challenging work, problem solving orientation; Effective internal and external communication and speed of response.*

5.5 Understanding Microfoundations; Integrating Dynamic Capability Organisational Innovation Strategies and Innovation Climate Literatures

Linking the processes supporting dynamic capability which were considered in Chapter 3, the organisational innovation strategies which emerged from studies considered in Chapter 4 and the dimensions of innovation climate which have emerged from a synthesis of the literature on innovation climate in this chapter, it is evident that there is a strong convergence of elements across all three areas. This convergence is summarized in Table 5.2 under the following headings:

- **Management support for innovation**
- **Positive social interactions**
- **Empowerment**
- **Learning**
- **Knowledge capability and capacity building**

Aligning literatures in the domains of dynamic capabilities, organisational innovation and innovation climate as outlined in Table 5.2 provides an initial framework for understanding the microfoundations (Felin and Foss, 2005, 2009; Abell et al., 2008; Felin et al., forthcoming) of dynamic capabilities for innovation. This alignment will be considered in the next section.

Table 5.2: Convergence of Evidence: Dynamic Capabilities, Organisational Innovation and Innovation Climate

	Dynamic Capability	Organisational Innovation	Innovation Climate
Management support for innovation	Reconfiguration of support activities of core processes Leveraging existing processes (Bowman and Ambrosini, 2003). Sensing; Seizing; Managing threats and Reconfiguration (Teece, 2007)	Encouraging risk-taking Tolerating risk and failure Encouraging new ideas Participative management style Visible leadership for innovation, strategic focus on innovation (Hage 1999; Damampour 1991; Conway and McMackin 1997; Read, 2000; McLeod and Clarke 2009)	**Encouragement and support from managers** Positive supervisory relationships; Top management support (Hunter et al., 2007) Leaders facilitation and support (James and James, 1989) Supervisory encouragement; Organisational encouragement (Amabile, 1993) Supervisory support (Oldham and Cummings, 1996; Patterson et al.,2005) ; Support for innovation (Anderson and West, 1998); Creative actions are rewarded (Ford, 1996) Idea support; Idea time; Cross-fertilization of ideas (Ekvall and Ryhammer 1999; Lansisalmi and Kivimaki, 1999). Resource availability (Kontoghiorghes et al., 2005; Hunter et al., 2007)
Positive social interactions	Networking facilitates learning Positive social interaction and relationships amplify and develop new knowledge (Nonaka, 1994; Kogut and Zander 1995; Nonaka, 1996; Lawson and Samson, 2001; Teece, 2007; Argote et al., 2003;).	External and internal networking Extensive communication between the organisation and the environment Customer/market focus (Slappendel,1996; Read, 2000; Shipton et al., 2006)	**Positive affective tone** Positive peer group; Positive interpersonal exchange (Hunter et al., 2007) Consideration, warmth and support (Campbell et al., 1970) Trust and openness; Emotional safety (Anderson and West, 1998) Thriving at work, vigour, energy (Claxton, 1998; Ekvall and Ryhammer 1999; Seligman et al., 2005; Spreitzer and Sutcliffe, 2007; Shirom, 2007) Participative safety (Anderson and West, 1998) Positive feelings and job satisfaction (Shipton et al., 2006) **Low stress** (Lansisalmi and Kivimaki, 1999). Innovation climate reduces stress (King et al., 2007)
Empowerment		Employee involvement practices Decentralised decision-making Flexible structures Participative management style (Damampour, 1991; Hage 1999; Conway and MaMackin 1997: Read 2000; Appelbaum, 2000; Black and Lynch, 2004; Shipton et al., 2006; Lynch 2007; McLeod and Clarke, 2009; Subramony, 2009)	Group work co-operation, friendliness and warmth, collaboration, playfulness and humour (James and James, 1989; Isaksen et al., 1998; Chadwick and Dabu, 2009 Work group support; more reflexivity (Amabile, 1993; West et al., 2004) Job challenge and autonomy (James and James, 1989) Creativity, independence, achievement (Ford,1996). Dual autonomy (Campbell et al., 1970) **Risk-taking and Flexibility** Risk-taking (Ekvall, 1997; Ekvall and Ryhammer, 1999; Hunter et al., 2007) Innovation and flexibility (Patterson et al., 2005) Risk-taking and new idea promotion (Kontoghiorghes et al., 2005)
Learning	**Purposeful collective learning processes** Learning is collective and organisational; Learning processes are intrinsically social and collective;; (Eisenhardt and Martin, 2000; Zollo and Winter, 2002; Teece, 2007;)	**Learning / Human capital Development** Workforce training Employer guided training HR tools: Induction, appraisal, contingent reward (Hage, 1999; Leavy and Jacobson 1997; Conway and McMackin, 1997; Lundvall, 1998; Appelbaum, 2000; Read, 2000; Lam, 2005; Lynch, 2007)	**Challenging work** Challenge, intellectual stimulation (West and Richter, 2007; Hunter et al., 2007; Oldham and Cummings, 1996) Role stress, job challenge (James and James, 1989) Workload pressure (Amabile, 1993) Task orientation (Anderson and West, 1998) Well-defined goals (Lansisalmi and Kivimaki, 1999).
Knowledge capability and capacity building	Exploitation of existing knowledge; exploration of new knowledge, (Eisenhardt and Martin, 2000; Prieto and Easterby-Smith, 2002; Argote et al., 2003; Winter, 1996; Lawson and Samson, 2001; Lundvall, 2007).)	Knowledge management and development , and technical knowledge resources (Hage 1999; Read 2000; Lam 2005)	**Effective communications** Effective extraorganisational and intraorganisational communication (Lansisalmi and Kivimaki, 1999). Outward focus and networking (Patterson et al., 2005) Open communication Information sharing (Kontoghiorghes et al., 2005; Rice, 2006) Collaborative idea flow and participative management (West and Richter, 2007) Communication skills (Ford, 1996). Low stress (Lansisalmi and Kivimaki, 1999). Social networking (Damanpour, 1991) External communication (Perry-Smith and Shalley, 2003) Extra organisational networking (Lansisalmi and Kivimaki, 1999).

This convergence in the dynamic capabilities, organisational innovation and innovation climate literatures can be understood as the alignment between the strategic macro level dynamic capabilities for innovation and the reflection of human resource management strategies which build and develop these configurations at a micro level. The alignment is an important starting point in linking macro-level capabilities with micro-level organisational foundations and in developing microfoundations (Felin and Foss, 2005, 2009; Abell, 2008; Felin et al., forthcoming). While dynamic capabilities reflect strategic macro-level processes such as reconfiguration, leveraging (Bowman and Ambrosini, 2003; Teece, 2007) and knowledge management processes (Lichtenthaler and Lichtenthaler 2009), organisational innovation strategies represent the human resource management strategies that are designed to develop these higher order capabilities. Organisational innovation strategies demonstrate how the human resources of the firm are refreshed, renewed (Ambrosini and Bowman, 2009) and reconfigured (Teece et al., 1997) and therefore begin to reflect how the microfoundations of dynamic capabilities can be built. The dimensions of innovation climate reflect the perceptions and feelings of employees (Dawson et al., 2008; King et al., 2007; West and Richter, 2009) on the climate in the organisation and the degree to which organisational innovation strategies have penetrated the minds and experiences of employees.

The alignment between dynamic capabilities for innovation, effective organisational innovation strategies and innovation climate dimensions is outlined in Table 5.2. The next section will examine the linkages across dynamic capabilities, organisational innovation and innovation climate more closely under the headings of the five broad capabilities outlined in Table 5.2: *management support for innovation, positive social interaction, empowerment, purposeful learning and knowledge capability and capacity building*.

5.5.1 Management Support for Innovation

Strategic management competence and support for innovation are central to the dynamic capabilities framework through reconfiguration of support activities and core processes, leveraging existing processes (Bowman and Ambrosini, 2003) and developing higher order competencies such as sensing, seizing and managing and reconfiguring threats (Teece, 2007). Organisational innovation strategies stress the human resource management aspects of support for innovation through the exercise of visible leadership and a participative management style (Damampour, 1991) and leader's facilitation and support (James and James, 1989). Supervisory encouragement (Amabile, 1993) of specific

innovation processes and behaviours is also required. Supervisor's support for risk-taking, toleration of risk and failure and encouragement of new ideas provide a strong focus for innovation throughout the various sections of the organisation (Damampour 1991; Conway and McMackin 1997; Hage, 1999; Read, 2000; McLeod and Clarke, 2009). At micro level, in settings where there is strong support for innovation, employees will experience a climate of positive supervisory and top management support for innovation (Oldham and Cummings, 1996; Patterson et al., 2005; Hunter et al., 2007). In such a climate, creative actions are rewarded (Ford, 1996), new ideas are supported (Ekvall and Ryhammer, 1999; Lansisalmi and Kivimaki, 1999) and resources are made available for innovation (Kontoghiorghes et al., 2005; Hunter et al., 2007).

5.5.2 Positive Social Interactions

Positive social interactions (Nonaka, 1994; Kogut and Zander, 1995) and positive peer group support (Hunter et al., 2007) are particularly pronounced as key elements of an organisational dynamic for innovation across all three literatures; dynamic capabilities, organisational innovation and innovation climate. Positive social interactions and relationships amplify and develop new knowledge in developing dynamic capability (Nonaka, 1994; Kogut and Zander, 1995; Lawson and Samson, 2001; Teece, 2007; Argote et al., 2003). Positive relationships also support organisational innovation processes such as networking (Damampour, 1991; Read, 2000; Perry-Smith and Shalley, 2003), risk-taking (Ekvall, 1997; Ekvall and Ryhammer, 1999; Hunter et al., 2007) and freedom and flexibility (Amabile, 1993; Ekvall and Ryhammer 1999; Lansisalmi and Kivimaki, 1999; Patterson et al., 2005; Hunter et al., 2007). Positive relationships and affective tone are also strongly represented in the innovation climate literature which is reflecting the perceptions and experiences of employees and the environment which is most conducive to creativity and innovation. Positive peer group support and interpersonal exchange (Hunter et al., 2007), consideration, warmth and support (Campbell et al., 1970) and employees perceptions of trust openness and emotional safety are linked to thriving at work, vigour and energy (Claxton,1997; Seligman et al., 2005; Spreitzer and Sutcliffe, 2007; Shirom,2007)

5.5.3 Empowerment

There is a strong focus on empowerment in the organisational innovation literature through employee involvement and flexible structures (Damampour, 1991; Hage 1999; Conway and MaMackin 1997: Read 2000; Appelbaum, 2000; Black and Lynch, 2004; Shipton et al., 2006; Lynch 2007; Subramony, 2009). This is mirrored in the innovation climate literature as freedom, flexibility and autonomy (Amabile, 1993; Ekvall and Ryhammer 1999; Lansisalmi and Kivimaki, 1999; Patterson et al., 2005; Hunter et al., 2007). Group work co-operation can be considered a manifestation of involvement and empowerment in innovation climate (James and James, 1989; Isaksen et al., 1998; Chadwick and Dabu, 2009) enabling reflexivity (West et al., 2004). However, empowerment does not feature in the dynamic capabilities literature. This is because dynamic capabilities privilege management (Thompson, 2007) and for the most part make little reference to the role of employees.

5.5.4 Purposeful Collective Learning

Purposeful collective learning is a central theme in the dynamic capabilities literature (Eisenhardt and Martin, 2000; Zollo and Winter, 2002; Teece, 2007). Learning and human capital development are reflected strongly in organisational innovation strategies through workforce training, employer guided training, HR tools such as induction, appraisal and contingent reward (Hage, 1999; Leavy and Jacobson 1997; Conway and McMackin, 1997; Lundvall, 1998; Appelbaum, 2000; Read, 2000; Lam, 2005; Lynch, 2007). An innovation climate offering challenging work, intellectual stimulation (Hunter et al., 2007; Oldham and Cummings, 1996) and job challenge (James and James, 1989), reflects an expectation of learning and a requirement for continued self-development. Learning, challenge and resilience are manifest in task orientation (Anderson and West, 1998) and well-defined goals (Lansisalmi and Kivimaki, 1999).

5.5.5 Knowledge Capability and Capacity Building

Knowledge capabilities and knowledge management capabilities are very strong elements in the dynamic capabilities framework. While knowledge management and configuration processes such as exploiting existing knowledge (Eisenhardt and Martin, 2000; Lawson and Samson, 2001; Prieto and Easterby-Smith, 2002; Argote et al., 2003) and creating new knowledge (Lundvall, 2007) are strategic higher order capabilities, developing knowledge capacities can be viewed as more micro-level processes (Lichtenthaler and Lichtenthaler 2009). Organisational innovation strategies supporting the development of knowledge capacities would include strong collaboration and knowledge sharing activities such as team

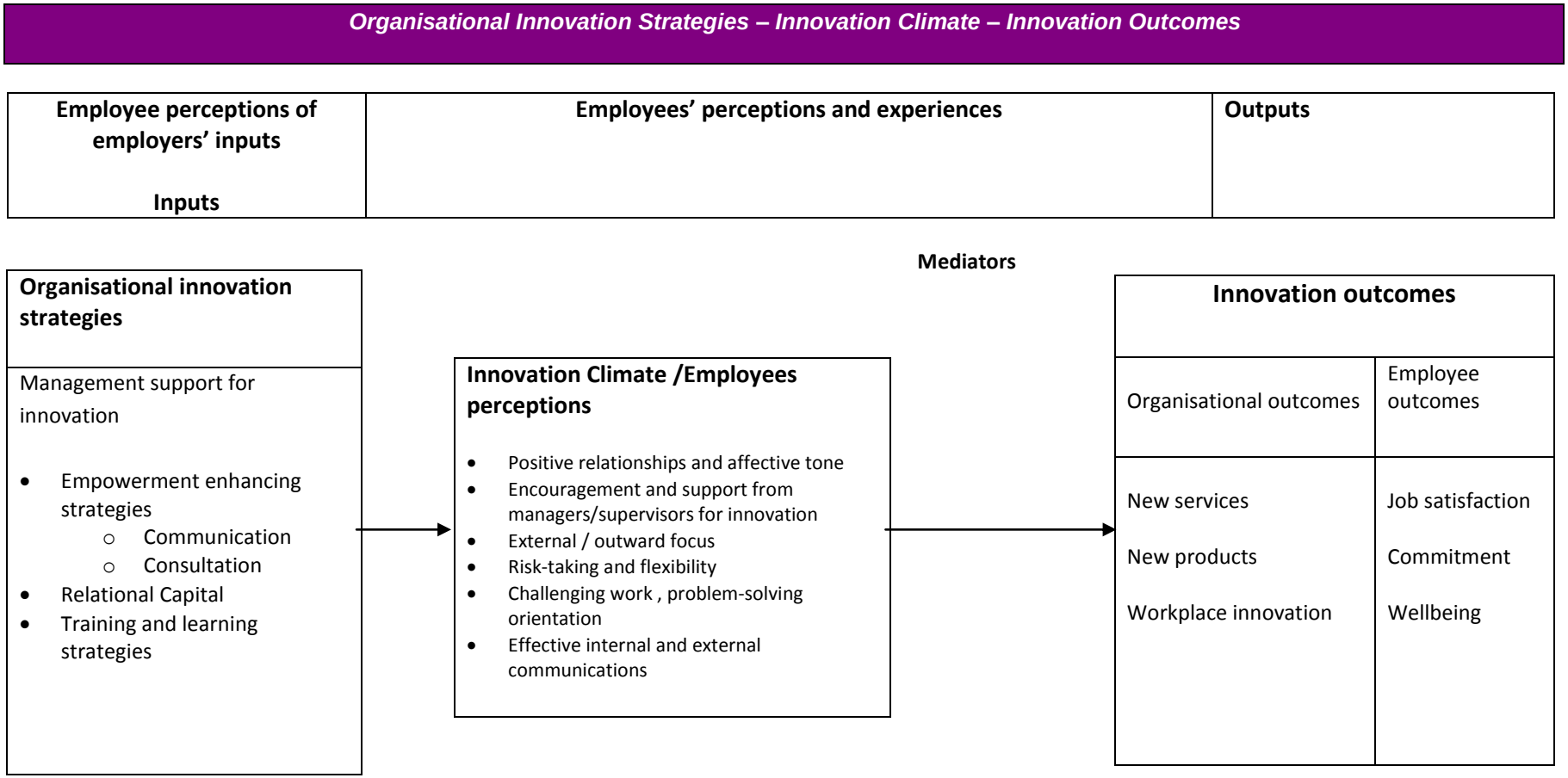
working, networking and the deployment of strategies for the expansion of technical knowledge resources (Hage 1999; Read, 2000; Lam 2005). Knowledge creation and strategies designed to develop organisational knowledge capacity are reflected in an organisational climate which supports social networking and external communications (Damanpour, 1991; Perry-Smith and Shalley, 2003), strong extra organisational and intra organisational communications (Lansisalmi and Kivimaki, 1999) and an outward – looking customer focus (Patterson et al., 2005). Diversity and diverse expertise also fuel knowledge development (Ford, 1996). Information sharing (Kontoghiorghes et al., 2005), effective extraorganisational and intraorganisational communication (Lansisalmi and Kivimaki, 1999) and social networking (Damanpour, 1996) enable collaborative idea flow and collaborative knowledge development. Participative management (West and Richter, 2007) management communication skills (Ford, 1996) and a low stress environment (Lansisalmi and Kivimaki., 1999) are also important elements of knowledge creation and growth processes which underpin innovation.

The alignment of elements of the dynamic capabilities, organisational innovation and innovation climate literatures can therefore be seen as an important starting point in linking macro-level capabilities with micro-level organisational foundations and in filling the void identified by Abell and his colleagues (2008). This alignment can also be understood from the different perspectives of employers and employees. Strategies and practices proactively promoting and supporting innovation would largely be the domain of management and would be initiated and implemented by managers. Innovation climate on the other hand reflects the perceptions and feelings of employees on the climate in the organisation and the degree to which the organisational innovation strategies employed by management encourage and proactively support their innovative dispositions, efforts and behaviours. The focus of the research in this study will be to examine the linkages between organisational innovation strategies, innovation climate and innovation outcomes in order to identify the micro-level organisational foundations which lead to the development of dynamic capabilities for innovation.

5.6 Towards a Research Model

The literature reviewed in this study has linked dynamic capability theory with the field of human resource management. Based on a review of the associated literatures, the study has identified organisational innovation strategies and innovation climate as important areas of investigation in exploring the organisational influences on employee innovation attitudes and behaviours (Amabile, 1993; Ford, 1996; Mumford, 2000; Takeuchi et al., 2009). The aim of this study is to assess the association between particular organisational innovation strategies, innovation climate, and innovation outcomes. Building on the literature reviewed in this study, the strategies which have been identified for investigation in this research are the empowerment-enhancing strategies, relational capital and learning strategies. The empowerment-enhancing strategies which will be investigated are frequency of communication and levels of consultation of employees. Relational capital will be investigated by assessing the quality of relationships between management and staff and the quality of relationships between staff members. Learning will be investigated by the degree to which employees have received any education or training paid for by their employer over the past two years. Innovation climate in the investigation will address the elements of innovation climate as outlined in the literature in this chapter as follows; *positive relationships and affective tone* (James and James, 1989; Ford, 1996; Hunter et al., 2007); *encouragement and support from managers and supervisors* (Amabile, 1993; West et al., 2004; Seligman et al., 2005; King et al., 2007; Hunter et al.,2007; Chadwick and Dabu, 2009); *external/outward focus and attention to customers* (Lansisalmi and Kivimaki, 1999; Read, 2000; Perry-Smith and Shalley, 2003; Patterson et al., 2005); *risk-taking and flexibility* (Ekvall, 1997; Patterson et al., 2005; Kontoghiorghes et al., 2005); *job challenge and problem solving orientation* (Campbell et al., 1970; Oldham and Cummings, 1996; Isaksen et al., 1998; Patterson et al., 2005;) and *extensive internal and external communication* (Ford, 1996; Lansisalmi and Kivimaki, 1999; Patterson et al., 2005). Innovation climate questions in this investigation are therefore drawn from the review of the literature and a synthesis of the key dimensions of innovation climate outlined in this chapter. Outcomes in the investigation include organisational outcomes such as the introduction of new products and services and new workplace innovation processes coupled with employee outcomes in the form of commitment, job satisfaction and wellbeing. The approach to the investigation is outlined diagrammatically in Figure 5.1 below.

Figure 5.1: Investigating Dynamic Capability for Innovation



5.7 Summary

In seeking to understand and operationalise dynamic capability for innovation, this chapter has identified innovation climate as an important element in the complex interaction between the individual's dispositions towards, and motivation for creativity and the design of the organisational contextual factors which support creativity and innovation (Amabile, 1993; Ford, 1996; Mumford, 2000; Takeuchi et al., 2009). Because climate is viewed as a mediating influence between organisational practices and employee behaviours (Ekvall, 1996; West and Richter, 2007), it is an important element in understanding how to influence and motivate employees' creative behaviours. This understanding is particularly important because creative thinking and behaviour are difficult to orchestrate and to sustain as they require the abandonment of habitual behaviours in favour of new and less certain ones (Ford, 1996; Ekvall, 1997). Understanding how to overcome this challenge will assist in unlocking the microfoundations of dynamic capabilities for innovation.

The literature reviewed in the previous three chapters and in this chapter, has identified a convergence between the dynamic capabilities, organisational innovation and innovation climate literatures. This alignment is an important starting point in linking macro-level capabilities with micro-level organisational foundations and in developing the microfoundations of dynamic capabilities for innovation (Abell, 2008; Felin et al., forthcoming). The focus of the research will be to examine the linkages between organisational innovation strategies, innovation climate and innovation outcomes in order to identify the micro-level organisational foundations which lead to the development of dynamic capabilities for innovation. Building on the literature reviewed in chapter four, the organisational innovation strategies which have been identified for investigation are empowerment-enhancing strategies, communication and consultation; relational capital; and learning strategies. Innovation climate in the investigation will address the elements outlined in this chapter from a synthesis of the literature and innovation outcomes in the investigation will include organisational outcomes as well as proximal employee outcomes (Wright and Gardner, 2003). Details of the research investigation and the proposed research model will be outlined in the next chapter.

Chapter Six: Research Methodology

6.1 Introduction

This study aims to uncover the underlying microfoundations of dynamic capabilities for innovation. As outlined in Chapter 3, the dynamic capabilities framework is an important conceptual framework for the study of innovation in organisations. However, the framework remains limited in its application because the foundations at micro level which affect innovation behaviour and build capabilities have not been identified or developed to any great extent (Capeda and Vera, 2007; Felin and Foss, 2005, 2009; Helfat and Peteraf, 2009; Barreto, 2010). In addressing this gap, this study links the domains of dynamic capabilities and human resource management. In attempting to elucidate the microfoundations of dynamic capabilities (Abell et al., 2008; Felin et al., forthcoming), this study investigates the association between organisational innovation strategies and innovation outcomes and explores the role of innovation climate in mediating these relationships.

From the literature reviewed in Chapter Four, the strategies associated with successful innovation in organisations were identified as empowerment enhancing strategies, strategies which build relational capital and learning strategies. The study will investigate how these organisational innovation strategies are associated with innovation outcomes; outcomes which include both organisational outcomes such as product, service and workplace innovation and proximal employee outcomes (Wright and Gardner, 2003) such as job satisfaction, commitment and wellbeing. It will examine the role of innovation climate as a mediator in seeking to explain how and why organisational innovation strategies are associated with innovation outcomes, a question that continues to create challenges (Boselie et al., 2005; Takeuchi et al., 2007; Harney, 2009; Guest, 2011). It is expected that the findings and understandings gained from this research will assist in unlocking the microfoundations of dynamic capabilities for innovation. The study is based on a large database of employee responses from the National Workplace Survey of Employees (2009). The research therefore offers a unique empirical opportunity to analyse employees' experiences and perspectives on innovation. The views of employees have been neglected in research to date as previous studies in these areas have been predominantly based on the responses of employers (Wall and Woods, 2005; Macky and Boxall, 2007; Guest, 2011).

In advancing the research methodology and approach taken, the chapter will first of all explore the philosophical underpinnings and methods of research typically found in organizational innovation studies. Secondly, it will present the research model, the research process and research design, the background to the research, as well as sampling, sample profile and questionnaire design. Thirdly, it will outline the research measures, independent variables, mediators, dependent variables and control variables, and factor analysis undertaken. Finally it will evaluate the research approach and limitations.

6.2 The Philosophical Foundations that Underpin Research Techniques in the Study of Organisational Innovation

While many authors make only scant reference to the ontological and epistemological challenges raised in the study of organisational innovation, throughout the literature there is on-going discussion about the nature of knowledge in the area and the appropriateness of research tools and research methodologies in accessing that knowledge (Slappendel, 1996; Leavy and Jacobson, 1997; Fearful, 1996; Hesketh and Fleetwood, 2006; Boselie et al., 2005; Harney 2009; Guest, 2011). The study of organisational innovation raises many of the philosophical questions and challenges common to all studies of social science. It also encounters many of the dilemmas faced by researchers in the area of human resource management (HRM) and, in particular, the challenges in establishing the link between HRM and performance. As in HRM, the positivist tradition predominates in studies of organisational innovation and innovation climate. Positivism seeks to set the study of human life on scientific foundations and it has been extensively used to characterise approaches to social science which involve the use of large data sets, quantitative measurement and statistical methods of analysis (Benton and Craig, 2001). The positivist ontology is therefore particularly suited to the current study which is an empirical analysis of organisational innovation at national level using a large national database of 5,110 employee responses. The research seeks to investigate the internal organisational dynamics of innovation in Ireland and to influence national innovation policy.

Exploring the advantages of the positivist approach in the context of this study more precisely, Benton and Craig describe the philosophical underpinnings of positivism as follows:

- *'The empiricist account of the natural sciences is accepted*
- *Science is valued as the highest or even the only genuine form of knowledge*
- *Scientific methods should be extended to the study of social science*
- *Once reliable scientific knowledge is established, it can be applied to plan for and regulate the behaviour of individuals and indeed society itself'* (Benton and Craig 2001, p. 23).

Burrell and Morgan (1979) use the term '*functionalism*' to describe the ontological and epistemological underpinnings of positivism which sees the world as concrete and objective, comprising empirical artefacts and relationships which can be identified and structured. Importantly, as well as seeing the world as concrete, it is also measurable scientifically, because, at the core of positivism, is '*an attempt to put the study of human life on a scientific footing by extending the methods and forms of explanation which have been successful in the natural sciences*' (Benton and Craib, 2001, p. 28). Positivism is based on a realist ontology which views knowledge and reality as separate and distinguishable from the human interpretation of the world and knowledge. Because the world is observable, our knowledge of the world centres on what is observable. This means that researchers use scientific methods of observation and analysis such as experimentation, testing and quantitative methods of data gathering in order to access the world of knowledge and find valid and objective findings (Seale, 2007; Benton and Craib, 2001).

In approaching this research, this researcher supports the positivist philosophy and the adoption of a scientific methodology because of the benefits of this methodology in meeting the study requirements. Notably, one of the original aims of this study is to influence policy makers and position organisational-level innovation more firmly in national innovation policy. Positivism offers particular advantages in a Government policy context because the empiricist account is widely accepted and among policy makers science and scientific methodologies are highly valued (Benton and Craib, 2001, p. 23). This is manifest in the logic of evidence-based policy making and its diffusion into management research (Campbell, 2002; Rousseau, 2006). Positivism offers an analytical approach that uses data to derive generalisations e.g., statistical generalisations independent of the researcher. It

uses well-established mathematical techniques and offers an integrative approach that works well with large numbers or large sample sizes - in this case a large national workplace survey. The research is seen as independent of the policy context and can be benchmarked with studies in other jurisdictions. It also affords opportunities for longitudinal comparative snap-shots and is predictive which is very valuable for policy makers, as it offers measurable inputs, outputs and established correlations. The positivist ontology which is context independent and underpinned by scientific methods is therefore particularly appropriate in the analysis of a large nationally representative database of responses such as that undertaken in this research.

While a positivist approach is adopted in this research and while the positivist tradition predominates in the study of organisational innovation and innovation climate (Patterson et al., 2005; Shipton et al., 2006; Liao et al., 2007; Kafouros et al., 2008), there is increasing recognition of the limitations of that approach. The positivist tradition, it is argued, relying on scientific evidence and employing quantitative methods, has limitations in tracking the dynamic interactions of organisational innovation and in developing appropriate indicators for measuring complex outcomes. It is argued that large scale scientific studies do not explain causality (Hesketh and Fleetwood, 2007) and are unable to measure accurately innovation constructs such as imagination and creativity (Conway,1997). In addition, some authors such as Slappendel (1996) reject the rational economic model of behaviour and decision–making and claim that many aspects of organisational behaviour are non-rational.

Authors arguing from and interpretivist ontology proffer that interpretivist approaches have relevance for the study of innovation. For example, the inextricable links between the individual and the world or in this case the organisation in the process of innovation (Slappendel, 1996) could be situated in the *phenomenological* ontology where the contention is that '*by being in the world we automatically experience it and the processes of understanding the streams of consciousness of others*' (Burrell and Morgan 1979. p. 244). The value of the interpretive sociology in organisational and workplace studies is also strongly championed by Fearful (2005). In exploring the workplace skill and knowledge of clerical workers she exposes the potential weaknesses of positivist approaches based on large quantitative studies, and contradicts much of the perceived wisdom and theoretical foundations on how information and office technologies (IOTs) are seen as a means of degradation and indeed the receptiveness of older workers to the benefits of IOTs.

In a similar vein noting the challenges of relying solely on the positivist tradition and the use of scientific methodologies alone in establishing the link between HRM and organisational performance, Hesketh and Fleetwood (2006) propose a critical realist ontology. They are critical of scientific methods attempting to establish the link between HRM and performance, as they determine that the nature of causality is more complex than that which scientific methods can measure. The critical realist philosophical and methodological approach therefore has merit in the study or organisational innovation and will in time help to rectify the deficit in our understanding of the process of organisational innovation and the development of a much needed theoretical framework.

However, even for Hesketh and Fleetwood, positivism has an important role. It is a useful starting point for measuring the link between organisational systems and performance but it is not the 'end game'. Critical realism while respecting the usefulness of the scientific approach acknowledges its limitations and suggests instead a causal- explanatory method. Similarly, Giddens (1984) who questions the positivist approach, recognises the role of positivism and the value of empiricist techniques such as large scale surveys, questionnaires and scientific data analysis. The positivist approach can be particularly appropriate and powerful in communicating findings to particular stakeholder groups, particularly at a policy level where there is a preference for such an approach.

Therefore, while it is important to recognise the limitations of positivism, it continues to occupy a central and predominant role in human resource management studies and the related areas of organisational innovation and innovation climate. Even those who are to the fore in advocating for alternative approaches, recognise the role of positivism and the value of empiricist techniques such as large scale surveys, questionnaires and scientific data analysis (Hesketh and Fleetwood, 2006). Indeed in reviewing the diversity of methods, researchers are advised to fully exploit the advantages that positivist approaches can offer in the study of social science (Benton and Craib, 2001).

In summary, because of its ability to synthesize and provide aggregate findings, its utility in generalization independent of the policy context, and because of the opportunities it offers in assessing and understanding levels of innovation in organisations nationally, positivism is particularly suited to the investigation undertaken in this study. It also offers well established techniques and increasingly sophisticated scientific approaches supported by

new technologies which are necessary for the analysis of the large and complex database on which this study is based.

6.3 Methodological Techniques used by Researchers Investigating Organisational Innovation

Predictably, because of the predominance of the positivist approach in the areas of HR studies, much of the research on organisational innovation is based on large-scale quantitative surveys (Bessant, 1995; Liao, Fei and Liu, 2007; Kafouros, 2007; Buckley, Sharp and Wang, 2008). These typically attempt to establish the links between organisational practices, particularly human resource management practices and levels of innovation. Examples of these large scale studies abound. In a major study on the sources of differences in the pattern of adoption of organisational and managerial innovations (OMIs), Isabel Freitas (2007) used the British WERS (Workplace and Employment Relations Survey) database to track the differences in adoption between 1990 and 1998. Liao et al. (2008) in seeking to examine the relationship between knowledge inertia, organisational learning and innovation surveyed one thousand two hundred organisations across the public and private sectors and used structural equation modelling to analyse the findings. Kafouros et al. (2007), seeking to establish the role of internationalisation in explaining organisational performance, used a sample of eighty – four firms from the UK manufacturing sector, with different degrees of internationalisation and tracked their performance over a fourteen year time frame. Guthrie et al. (2009) drew on a detailed survey of 132 medium to large companies in Ireland to explore how management policies and practices are related to organisational performance and innovation.

Shipton et al. (2006) adopting a more nuanced methodology, drew on a data set developed in a large study of 111 companies between 1992 and 1999 (West et al., 1999) in conducting a longitudinal study which involved taking measurements of HR practices at three specific points in time. The study examined market environment, organisational characteristics and managerial practices by interviewing managers in 22 companies on site. The research examined the relationship between the data gathered from the managerial interviews and data gathered from the innovation surveys of the same companies. This approach therefore while using the evidence gained from quantitative research, also used a qualitative methodology in relying on the interpretation of the researcher in analysing the findings from the interviews as they measured the extent and quality of innovation.

Despite the pervasiveness of the use of empirical studies to establish and explain the links between organisational strategies and innovation, similar to the arguments made against positivist philosophical underpinnings, there is likewise a body of literature which challenges its methodologies (Slappendel, 1996; Hesketh and Fleetwood, 2006; Harney, 2009). For example, in supporting the greater use of more qualitative approaches to HR research, Hesketh and Fleetwood (2006) propose a critical realist meta-theory methodology to studies in this field. An example of the critical realist approach is Howell's (2005) research, aimed at identifying the characteristics of effective champions of innovation, which combines empirical survey data with in-depth qualitative interviews. Using a multi-layered approach, Howell sheds light on the underlying processes and causes of innovation or what Hesketh and Fleetwood call '*complex causality and robust explanation*' (Hesketh and Fleetwood, 2006, p. 683) by identifying the behaviours of effective champions. In summary, while the preponderance of studies in organisational innovation come from a positivist tradition and adopt quantitative methodologies, it is evident that there are benefits in adopting both quantitative and qualitative methodologies.

Adopting the positivist philosophy, this research study uses quantitative methodologies because of the benefits of this approach to the particular study being undertaken which is an analysis of employees' experiences and perspectives based on findings from a national workplace survey. Analysing data from this large survey of employees will make an important contribution to the research already available as much of the criticism of HRM – performance research has been that it relies on small sample sizes and predominantly privileges management as the preferred survey population (Wall and Woods, 2005). The HRM – performance surveys often require management respondents to merely verify if particular strategies have been introduced or are present in the workplace (Harney, 2009 p. 7) and when employees' responses are sought, very often these responses are at variance with those received from management (Guest, 2011). In addition, this study will address the links between organisational innovation strategies and innovation outcomes, an area that has received little attention in previous HR–performance studies (Laursen and Foss, 2003; Savanevicienne and Stankeviciute, 2010). In 2003, Laursen and Foss noted the '*lack of theoretical and empirical treatment of how HRM practices affect innovation performance*' (Laursen and Foss, 2003, p. 244) and this neglect persists today. In adopting this approach, this study relies on the technical tools of scientific enquiry and uses these tools to investigate correlations and relationships. Thus, while recognizing the value of multi-method approaches in providing a more rounded picture of complex phenomenon,

the purpose, sample and pragmatics of the current research find favour with a more positivistic research philosophy and associated survey based approach.

6.4 Research Model

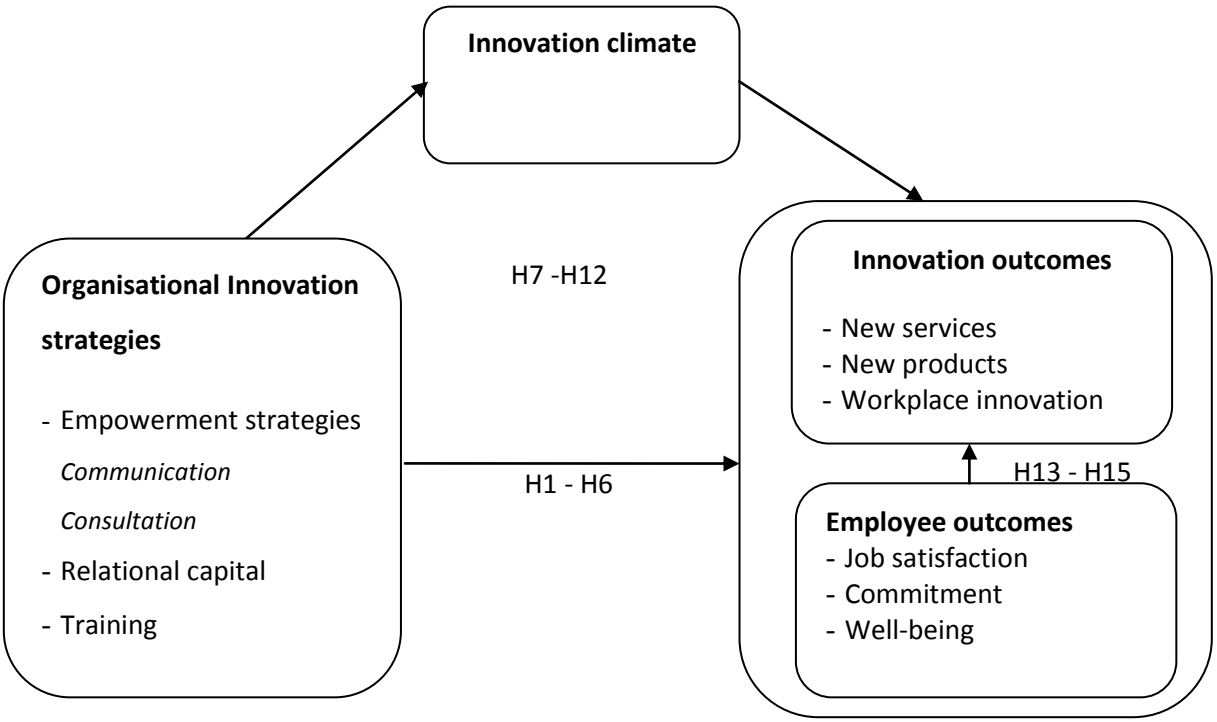
The literature reviewed in this study progressed from macro literature on National Systems of innovation (NSI), through dynamic capabilities and their deficiencies to focus on the importance of employee insights and employee perceptions of organisational innovation strategies. Following this lead the empirical investigation aims to elucidate the microfoundations of dynamic capability for innovation. It seeks to investigate the individual processes, interactions and behaviours at micro-level which collectively create the routines and activities that underpin dynamic innovation capability (Abell et al., 2008: Felin et al., forthcoming). Linking dynamic capability theory with human resource management and based on a review of the associated literatures, the study has identified organisational innovation strategies and innovation climate as important areas of investigation in the exploration of contextual influences on employee innovation behaviour (Amabile, 1993; Ford, 1996; Mumford, 2000; Takeuchi et al., 2009). The aim of the research is to assess the association between organisational innovation strategies, innovation climate, and innovation outcomes. Outcomes in the investigation include organisational outcomes such as the introduction of new products and services and new workplace innovation processes coupled with employee outcomes in the form of commitment, job satisfaction and wellbeing.

The study uses data from the National Workplace Survey of Employees (2009). As the Director of the National Centre for Partnership and Performance (NCPP), the agency responsible for commissioning and overseeing this survey, the researcher had access to the survey data. This provided a unique opportunity for the current research as the researcher had access to a large database of employee responses on innovation in Irish workplaces. However, while the survey offered much potential for the exploration of the internal dynamics of innovation in Irish workplaces, the availability of the data also posed limitations and challenges for the current study. The survey questionnaire, while posing questions on organisational innovation, as a national workplace survey of employees, was also designed to accommodate a broad range of questions on workplace issues, issues relating to workers' experiences at work, attitudes to work, work environment and conditions, levels of change in Irish workplaces and the degree to which workers were experiencing and responding to such change. Consequently, the data available on

innovation posed challenges in relation to the number and range of innovation strategies that could be investigated.

However, the unique opportunity presented by the availability of the survey data far outweighed the challenges presented by the survey constraints. The data offered rich opportunities for exploring key elements in building innovation capability in organisational settings. Drawing on the literature and exploiting the opportunities offered by the survey data, a research model was developed to investigate the association between organisational innovation strategies, innovation climate, and innovation outcomes and thereby elucidating the microfoundations of dynamic capability for innovation. The proposed research model is outlined in Figure 6.1 below.

Figure 6.1: Theoretical Model with Proposed Hypotheses



Following the logic of Baron and Kenny (1986) the analysis will investigate the following;

1. **Organisational innovation strategies and organisational innovation outcomes;** the strength of the relationship between organisational innovation strategies, (empowerment-enhancing strategies of communication and consultation, relational capital and training) and organisational innovation outcomes, (product, service and workplace innovation) (H1-H3).
2. **Organisational innovation strategies and employee outcomes;** the strength of the relationship between organisational innovation strategies, (empowerment-enhancing strategies of communication and consultation, relational capital and training) and employee outcomes (job satisfaction, commitment and wellbeing outcomes) (H3-H6).
3. **Innovation climate as a mediator;** whether innovation climate acts as a mediator in the relationship between organisational innovation strategies and organisational outcomes (new services, new products and workplace innovations) (H7-9).
4. **Innovation climate as a mediator**; whether innovation climate mediates the relationship between organisational innovation strategies and employee outcomes such (job satisfaction, commitment and wellbeing) (H9-H12).
5. **Employee outcomes and organisational outcomes;** the strength of the relationship between employee outcomes; (job satisfaction, commitment and wellbeing) and organisational innovation outcomes (product innovation, service innovation and workplace innovation) (H13-H15).

6.4.1 Organisational Strategies and Organisational Outcomes (H1-H3)

The first area of investigation is to assess the link between organisational innovation strategies and innovation outcomes such as the introduction of new products, new services and new workplace innovations. In the previous chapter a wide range of studies which analysed the factors associated with successful innovation were reviewed. In addition, evidence from the National Workplace Survey of Employers (2009) demonstrated that particular employer strategies were linked to increased levels of innovation outcomes. A summary of these organisational innovation strategies based on the literature and supporting evidence form the National Workplace Survey of Employers (2009) is outlined below as follows:

- Empowerment-enhancing strategies (Conway and McMackin, 1997; Read, 2000; Black and Lynch, 2004; Shipton et al., 2006; McLeod and Clarke, 2009)
- Relational capital, positive social interaction (Damampour, 1991; Conway and McMackin, 1997; Read, 2000 ; Skarzynski and Gibson, 2008)
- Learning strategies (Leavy and Jacobson 1997; Lundvall, 1998, 2007; Read, 2000; Shipton et al., 2006)

In this study, empowerment-enhancing strategies investigated are communication and levels of consultation. Relational capital is measured by the nature of the relationships between management and staff and relationships between staff members. Learning strategies are measured by the extent to which employees are offered employer provided training during the past two years.

While the above approaches are management lead proactive strategies for innovation, the current research is focussed on the responses of employees and their perceptions of the presence of such strategies for innovation in their workplaces. This study will test these links using data from the National Workplace Survey of Employees (2009), which it is suggested is a more authentic assessment of the presence or absence of organisational practices and strategies promoting innovation. In exploring the association between organisational strategies and organisational outcomes the investigation will test the following hypotheses:

Organisational strategies and organisational outcomes:

Hypotheses: Organisational innovation strategies are positively associated with organisational innovation outcomes

1. Organisational innovation strategies; i.e. communication (1a), consultation (1b), relational capital (1c) and training (1d), are positively associated with the introduction of new services.
2. Organisational innovation strategies, i.e. communication (2a), consultation (2b), relational capital (2c) and training (2d), are positively associated with the introduction of new products.
3. Organisational innovation strategies, i.e. communication (3a), consultation (3b), relational capital (3c) and training (3d), are positively associated with the introduction of new workplace innovations.

6.4.2 Organisational Strategies and Employee Outcomes (H4-H6)

The study will then investigate whether organisational innovation strategies are linked to employee outcomes such as job commitment, job satisfaction and wellbeing outcomes such as lower levels of work pressure and stress. Investigating the link between organisational innovation strategies and measures that reflect employee outcomes such as job satisfaction, commitment and wellbeing is important because of the importance of wellbeing and positive affective tone to creativity and innovation in the literature (James and James, 1989; Isaksen et al., 1998; Chadwick and Dabu, 2009). Social interaction and good relationships are also important aspects of dynamic capability for innovation (Kogut and Zander, 1995; Nonaka, 1996; Teece, 2007) as such social relationships create opportunities to grow, retain and transfer knowledge (Argote et al., 2003). It is expected therefore that organisational innovation strategies such as the empowerment enhancing strategies of communication and consultation, relational capital, and opportunities for employer paid training will be strongly related to employee outcomes such as increased job satisfaction, commitment and well- being. In exploring the association between organisational strategies and employee outcomes the investigation will test the following hypotheses:

Organisational strategies and employee outcomes:

Hypotheses: Organisational innovation strategies are positively associated with employee outcomes

4. Organisational innovation strategies, i.e. communication (4a), consultation (4b), relational capital (4c) and training (4d), are positively associated with employee job satisfaction.
5. Organisational innovation strategies, i.e. communication (5a), consultation (5b), relational capital (5c) and training (5d), are positively associated with employee commitment.
6. Organisational innovation strategies, i.e. communication (6a), consultation (6b), relational capital (6c) and training (6d), are positively associated with employee wellbeing; reduced work pressure and stress.

6.4.3 Innovation Climate and Organisational Outcomes (H7-H9)

In assessing the impact of innovation climate, the study will test whether innovation climate acts as a mediator in the relationship between organisational innovation strategies and innovation outcomes. While organisational innovation strategies represent the HR '*architecture*' (Becker and Gerhart, 1996, p. 786) which is designed by management, innovation climate reflects the perceptions and feelings of employees on the impact of these strategies. HR strategies influence employee climate perceptions by symbolically framing (Rousseau, 1995) and communicating key organisational values and behaviours. Climate is therefore a powerful social mechanism through which HR systems influence employee perceptions, behaviours and values and is an important element in understanding the impact of organisational innovation strategies on employees (Mossholder et al., 2011). As innovation climate reflects the views and perceptions of employees, the strength of innovation climate it is proposed, is a good measure of what employees receive and experience in terms of organisational innovation inputs from the employer. In other words a strong innovation climate demonstrates that the strategies articulated and designed by managers are actually being enacted (Anderson and West, 1998). It would be expected that innovation climate would be strongly linked with other organisational innovation strategies reflecting the presence of an innovation dynamic where there is a synergy between different policies and inputs from managers and employee perceptions and awareness of these inputs. The following hypotheses were tested in assessing the mediation effect of innovation climate:

Innovation climate and organisational outcomes:

Hypotheses: Innovation climate mediates the relationship between organisational innovation strategies and organisational innovation outcomes

7. Innovation climate mediates the relationship between organisational innovation strategies i.e. communication (7a), consultation (7b), relational capital (7c) and training (7d), and the introduction of new services.
8. Innovation climate mediates the relationship between innovation strategies i.e. communication (8a), consultation (8b), relational capital (8c) and training (8d), and the introduction of new products.
9. Innovation climate mediates the relationship between innovation strategies i.e. communication (9a), consultation (9b), relational capital (9c) and training (9d), and the introduction of new workplace innovations.

6.4.4 Innovation Climate and Employee Outcomes (H10-H12)

The study will investigate whether innovation climate mediates the relationship between organisational innovation strategies and employee outcomes such as job satisfaction, commitment and wellbeing. As discussed in Chapter 5, climate is viewed as a mediating influence between organisational practices and employee outcomes such as increased commitment, job satisfaction, motivation and helping behaviours (Rousseau, 1995; Ekvall, 1996; West and Richter, 2007; Mossholder et al., 2011). For example, Takeuchi, Chen and Lepak (2009) examined the relationships between the implementation of High Performance Work Practices (HPWP) and employee attitudes. The findings suggest that concern for employee climate acts as an important mediator between organisational practices and employee attitudes leading to increased job satisfaction and affective commitment (Takeuchi et al., 2009). Because innovation climate is primarily about perceptions and feelings, it is proposed that it will increase job commitment and job satisfaction and will therefore be positively associated with innovation outcomes in the form of product, service and workplace innovation.

Furthermore some authors suggest that high levels of commitment are particularly important in the process of creativity and innovation. For example, individuals must be deeply and intrinsically interested in the issue or problem they are trying to solve in order to be motivated to find a solution (Amabile, 1993). Csikszentmihalyi's (1990) work on problem solving lead him to suggest that finding solutions to difficult and intractable problems required high levels of interest, curiosity and application.; this state he called *'flow'* (Csikszentmihalyi, 1990). Thus it would seem that high levels of effort and commitment are required for innovation to occur and one of the effects of innovation climate is that it leads to high levels of commitment and engagement of employees (Blau, 1964; Takeuchi et al., 2009; Cavagnou, 2011).

Job satisfaction is also important for innovation performance because, as already noted, positive organisational climate is thought to enhance motivation and increase the likelihood that employees will give discretionary effort to their work (Brown and Leigh, 1996; Neal and Griffin, 1999). There are a number of studies that have explored the link between job satisfaction and positive organisational innovation outcomes. From a large study of 3,717 employees, Shipton (2006) and her colleagues, deduce that where the majority of employees experience job satisfaction, they will endorse rather than resist innovation and work collaboratively to implement as well as to generate creative ideas (Shipton et al.,

2006). Similarly, Takeuchi et al. (2009) in a cross level analysis demonstrated that concern for employee climate acts as an important mediator between organisational practices, in this case HPWS practices and employee attitudes leading to increased job satisfaction and affective commitment (Takeuchi et al., 2009). The following hypotheses will therefore be tested:

Innovation climate and employee outcomes:

Hypotheses: Innovation climate mediates the relationship between organisational innovation strategies and employee outcomes

10. Innovation climate mediates the relationship between organisational innovation strategies i.e. communication (10a), consultation (10b), relational capital (10c) and training (10d) and employee job satisfaction.
11. Innovation climate mediates the relationship between organisational innovation strategies i.e. communication (11a), consultation (11b), relational capital (11c) and training (11d) and employee commitment.
12. Innovation climate mediates the relationship between organisational innovation strategies i.e. communication (12a), consultation (12b), relational capital (12c) and training (12d) and employee wellbeing.

6.4.5 Employees Outcomes and Organisational Outcomes (H13-H15)

The study will investigate whether employee outcomes such as commitment, job satisfaction and wellbeing are positively related to organisational outcomes such as new products, new services and workplace innovation. As discussed in the previous chapter, employee wellbeing and low stress are important determinants of innovation and creativity. When HR practices are interpreted by employees as expressing appreciation, investment and recognition, then employees feel valued and are motivated to contribute more discretionary effort and this in turn leads to improved performance (March and Simon, 1958; Blau, 1964). This is based on the premise that employee wellbeing and favourable employee perceptions of the organisational environment are positively related to performance (James and James, 1989; Amabile, 1993; Ekvall and Ryhammer 1999; Shipton et al., 2006; Hunter et al. 2007). In analysing the association between employee outcomes and organisational outcomes the following hypotheses will be tested:

Employee outcomes and organisational outcomes:

Hypotheses: Employee outcomes are positively associated with organisational outcomes

13. Employee outcomes, i.e. job satisfaction (13a), commitment (13b) and wellbeing (13c) are positively linked to the introduction of new services.
14. Employee's outcomes, i.e. job satisfaction (14a), commitment (14b) and wellbeing (14c) are positively linked to the introduction of new products.
15. Employee's outcomes, i.e. job satisfaction (15a), commitment (15b) and wellbeing (15c) are positively linked to the introduction of new workplace innovations.

In testing these hypotheses (outlined in the research model in Figure 6.1) this study will analyse the data from the Employee survey. Details of the survey and research design are expanded in the next section.

6.5 Research Design

This study uses the data from the National Workplace Survey of Employees (2009). Together with the accompanying National Workplace Survey of Employers (2009), these surveys of employers and employees are the second major national workplace surveys conducted in Ireland in the past decade – the first surveys were conducted in 2003. They are the largest workplace surveys undertaken in Ireland, having surveyed 5,110 employees in both the public and private sectors and 3,027 employers in the private sector and public sectors.

6.5.1 Research Process

As the Director of the National Centre for Partnership and Performance (NCPP), in 2002 the investigator sought approval from Government for funding to commission and conduct workplace surveys in Ireland (See Appendix A for further details on the NCPP). As a new agency established to promote workplace change and progressive workplace practices through a partnership approach, the NCPP identified that there was an absence of evidence on workplace practices in Ireland and a dearth of data on the experiences and attitudes of workers at work The aim was to begin to gather information on working conditions in Ireland, similar to that provided by the WERS (Workplace and Employment Relations Survey) database in Britain. Approval and funding for the surveys was granted and the first series of surveys was conducted in 2003, with the report of the findings published in 2004 (*The Changing Workplace: A Survey of Employees' Views and Experiences, ESRI, NCPP 2004*). The NCPP oversaw the project and commissioned the Economic and Social Research

Institute (ESRI) to conduct the fieldwork. NCPP executive staff and ESRI professional staff developed the survey questionnaire for the 2003 surveys, with the advice of Bill Roche, Professor of Industrial Relations and John Geary, Professor of IR and HR at University College Dublin.

In 2008, a proposal from the researcher, in her capacity as Director of the NCPP to conduct the second in the series of workplace surveys was approved and funded by Government. The 2009 surveys aimed to provide a nationally representative sample of Irish employees specifically exploring workers' experiences at work and attitudes to their work, work environment and conditions. It also sought to establish levels of change in workplaces, the degree to which progressive and modern workplace approaches were being implemented and whether workers were experiencing and responding to such change. In this regard the 2009 surveys allowed for changes to be tracked over time and the findings could be compared with the findings from the 2003 surveys. Because of the researcher's interest in innovation in organisations, for the first time the 2009 surveys also captured data on innovation in Irish workplaces. It is this latter addition which provided a unique opportunity for the current research. As outlined in section 6.3 this opportunity also posed challenges and limitations in relation to the investigation as the employee survey, on which this study is based, was designed to capture information on a broad range of workplace issues and concerns, thus limiting somewhat the availability of data specifically relating to the area of organisational innovation. However, the opportunity presented by the availability of this unique dataset meant that the current research could be designed to exploit the potential that was available from such a large employee dataset.

6.5.2 Methodology and Sample Selection

The data for the employee survey was gathered by means of a national telephone survey of employees. The survey targeted employees in the public and private sectors (excluding agriculture) aged 15 and over. A pilot was undertaken in February 2009. Following the pilot, the survey was conducted by telephone from March to June 2009 by Amárach Research, a private research consultancy. A complimentary postal survey of employers was carried out at the same time. The employer and employee surveys were not designed to provide matched data and so are not linked. The same is true of national surveys such as WERS in the UK.

The sample of the telephone survey was generated on a stratified random basis. All interviews were completed with the questionnaire-scripted NIPO software. NIPO is a software programme developed by TNS in the Netherlands. It provided capabilities in the following areas; in managing CATI (Computer Assisted Telephone Interviewing); as a data entry package; in managing the telephone sample numbers where numbers were automatically sent to interviewers for dialling; managing appointments with respondents, and in monitoring sample quotas and overall targets in order to track progress. Importantly it also afforded a real time monitoring system to ensure quality of interviewing is maintained. This ensured a systematic and transparent means of data collection whereby progress could be clearly monitored.

6.5.3 Response Rate

There were 5,110 completed and usable survey responses from a total of 65,000 numbers presented. The majority of these, 45,000, were not eligible for the survey for varying reasons as follows; number not in service; nobody in the household was an employee; or because a sufficient number had already been completed in the area of that gender and age category. A further 10,832 numbers were of unknown eligibility because the interviewer was unable to determine whether anyone in the household was in employment. In calculating the response rate, it was necessary to estimate the proportion of these numbers that were likely to have been eligible. This was done by taking the eligibility rate where this was known which was 16% giving a total estimated eligible figure of 10, 186. The response rate, calculated as completed interviews as a percentage of the total estimated numbers eligible was 50 per cent.

6.5.4 Reweighting the Data

The data was reweighted or statistically adjusted prior to analysis to ensure that it was fully representative of the full population of all employees living in private households. Data for reweighting came from the *Quarterly National Household Survey (QNHS*) from the first quarter of 2009. This is a large sample survey of over 30,000 interviews per quarter. It is conducted by the Central Statistics Office (CSO) which is used to provide definitive information on the Irish labour market.

6.5.5 Questionnaire Design

The design of the National Workplace Survey questionnaire was a collaborative process overseen by the researcher. This involved collaboration with a team from the Economic and Social Research Institute (ESRI) and an executive team from the NCPP. The ESRI team included Professor Philip O'Connell who specialises in labour market research, Dr. Helen Russell and Dr. Dorothy Watson. The NCPP team was comprised of Dr. Damian Thomas, Cathal O 'Regan and Edna Jordan. The design process also included consultation with a broad range of stakeholders. These stakeholders represented the social partners and included the Irish Business and Employers' Confederation (IBEC) representing employers, the Irish Congress of Trade Unions (ICTU) representing employees and trade unions, Government representatives including senior officials from the Department of the Taoiseach, the Department of Finance and the Department of Enterprise Trade and Employment. It also drew on the 2003 Workplace Survey which had been designed with the assistance of Professor Bill Roche and Professor John Geary.

Because of the researcher's interest in surveying levels of innovation in Irish workplaces, there was a new focus on innovation in the 2009 surveys. The National Workplace Surveys (2009) therefore were aimed at capturing levels of innovation in Irish organisations and workplaces and as part of this study, the survey was designed to establish if there were associations between particular organisational and management practices and innovation outcomes.

Three elements of innovation were included in the survey questionnaire. Firstly, organisational strategies which were shown to contribute to increased levels of innovation in the organisation; strategies which enhance employee empowerment such as strong communications and meaningful consultation (Read, 2000; Appelbaum, 2000; Black and Lynch, 2004; Shipton et al., 2006; Lynch, 2007; McLeod and Clarke, 2009; Subramony, 2009), strategies on positive relationships (Damampour 1991; Slappendel,1996; Conway and McMackin, 1997; Read, 2000) and support for employee training and learning (Leavy and Jacobson 1997; Hage, 1999; Read, 2000; Lundvall, 1998,2007; Shipton et al., 2006).

Secondly, the survey questionnaire included innovation outcome questions which contained three organisational outcome measures; whether the organisation had introduced new products in the past two years, whether the organisation had introduced new services in the past two years and whether new workplace innovations leading to

improvements in work processes were introduced in the past two years. New workplace innovations were defined as '*new ideas, processes or behaviours that lead to significant improvements in the way work was carried out*'. This definition of workplace innovation as an outcome reflects significant improvements in how work was carried out and was drawn from extensive work carried out in the NCPP over a number of years. The questionnaire also included employee outcome measures; commitment, job satisfaction and wellbeing. Employee outcome questions were included as it is suggested that an organisational environment perceived by employees as supportive is positively related to productivity and increased innovation through the mediation of job involvement and effort (Brown and Leigh, 1996). High levels of job satisfaction are also important for innovation performance because as discussed in Chapter 5, positive organisational climate enhances motivation and increases the likelihood that employees will give 'discretionary effort' to their work (Brown and Leigh, 1996; Neal and Griffin, 1999).

Thirdly, the survey included a set of questions designed to establish levels of innovation climate. The questions asked address elements of innovation climate as outlined in the literature: *acceptance and encouragement of new ideas* reflecting positive relationships affective tone and encouragement and support from managers and supervisors (James and James, 1989; Amabile, 1993; Oldham and Cummings, 1996; Ford, 1996; Ekvall and Ryhammer 1999; Kontoghiorghes et al., 2005; Hunter et al., 2007), *searching for new ways of looking at problems* reflecting job challenge and problem solving orientation (Campbell et al., 1970; James and James, 1989; Isaksen et al., 1998; Patterson et al., 2005; Hunter et al.,2007), *customer/market focus* reflecting external and outward focus and attention to customers (Lansisalmi and Kivimaki, 1999; Read, 2000; Patterson et al., 2005); *encouraging risk-taking and tolerating risk and failure* (Ekvall, 1997; Ekvall and Ryhammer, 1999; Patterson et al.,2005; Kontoghiorghes et al., 2005; Hunter et al., 2007), *quick response when changes need to be made* reflecting outward focus and responsiveness (Ford, 1996; Lansisalmi and Kivimaki, 1999; Perry-Smith and Shalley, 2003; Read, 2000; Patterson et al., 2005), and *external focus and extensive communication between the organization and the environment in searching for new opportunities* (Lansisalmi and Kivimaki,1999; Patterson et al.,2005). Innovation climate questions were drawn from the review of the literature and a synthesis of the key dimensions of innovation climate in Chapter 3. They also drew on Patterson's organisational climate measure (OCM) (Patterson et al., 2005). How innovation climate questions relate the dimensions of climate for creativity and innovation in the literature is outlined in Table 6.1.

Table 6.1: Mapping Innovation Climate Questions in Employee Survey with Dimensions of Innovation Climate from Selected Literature

Innovation Climate Questions	*Dimensions of innovation climate*	*Sample of Literature sources*
New ideas are readily accepted in my workplace	Positive relationships, affective tone	Campbell et al. (1970) James and James (1989), Amabile (1993) Claxton (1998), Isaksen et al. (1998), Anderson and West (1998)
People in my organisation are always searching for new ways of looking at problems	Encouragement and support from manager/ supervisors	Ekvall and Ryhammer (1999), Lansisalmi and Kivimaki (1999), West et al. (2004) Seligman et al.(2005) Patterson et al.(2005), Shipton et al.(2006) Hunter et al. (2007), Shirom (2007) King et al. (2007), Chadwick and Dabu (2009)
Customer needs are considered top priority in my organisation	External, outward focus	James and James (1989) Amabile (1993), Ford (1996) Anderson and West (1998) Ekvall and Ryhammer (1999) Lansisalmi and Kivimaki (1999) Patterson et al. (2005), Hunter et al. (2007) Ford (1996), Ekvall and Ryhammer (1999) Lansisalmi and Kivimaki (1999) Perry-Smith and Shalley (2003) Patterson et al. (2005) Kontoghiorghes et al. (2005) Hunter et al. (2007)
This organisation is prepared to take risks in order to be innovative	Risk-taking and flexibility	Ekvall (1997), Ekvall and Ryhammer (1999) Patterson et al. (2005) Kontoghiorghes et al. (2005), Hunter et al. (2007)
This organisation is quick to respond when changes need to be made	Challenge /problem solving orientation	Oldham and Cummings (1996) Ford (1996), Amabile (1993) Rice (2006), James and James (1989) Anderson and West (1998) Lansisalmi and Kivimaki (1999), Hunter et al. (2007)
This organisation is continually looking for new opportunities in a changing environment	Effective internal and external communications	Amabile (1993), Lansisalmi and Kivimaki (1999) Ford (1996) Kontoghiorghes et al. (2005) Patterson et al. (2005) Rice (2006), West and Richter (2007)

In designing the innovation elements of the questionnaire, the researcher was influenced by the approach taken in the Danish DISCO survey (Lundvall). This survey measured the impact of what Lundvall calls DUI innovation, innovation based on *doing*, *using* and *interacting* (2007, p. 104*)* in organizations to distinguish it from innovation which emerges from more formal R&D processes which he calls STI or Science and Technology Innovation. Because DUI involves interaction between people, it can be fostered by building structures and relationships which enhance innovation and learning by doing, using and interacting

(Jenson et al., 2007). It enables intensive and continuous problem-solving and enhances the skills repertoire of employees (Lam, 2005; Lorenz and Valery, 2004). It also facilitates a move beyond a narrow concept of the sources of innovation which concentrates on R&D to a broader organisational and experience based view of innovation sources (Tidd et al., 2001; Taylor and McAdam, 2004; Green, 2009).

The basis for measuring DUI in the Danish survey was provided by strategic human resource management literature, literature on learning organizations and high performance work systems. The DUI measures in the Irish survey have drawn from a broader pool of literature and previous research. They have also been based on the literature on organisational innovation, the literature on dynamic capabilities and the literature on innovation climate and so expand the conceptual base of the literature on human resource management.

While the research focus in this study is on organisational innovation, the National Workplace Survey of Employees as a national survey was designed to capture a much more comprehensive range of information on the nature of the individual's job and the organisation of work. It surveyed levels of change and willingness to change, skills and learning, reward systems and earnings, employee wellbeing, employee engagement, information and consultation, trade-union presence and membership as well as the impact of particular workplace strategies on business outcomes and performance. The questionnaire replicated items included in the 2003 National Workplace Survey in order to track the changes in the experiences of employees and the changing nature of work in Irish workplaces in the intervening years which were a period of intense change.

6.5.6 Sample Profile

Among the respondents, 48 per cent were male, 52 per cent were female; 64 per cent were employees, 11 per cent were supervisors, 16 per cent were middle managers and 9 per cent were senior management; 37 per cent were from the public sector, 58 per cent were from the private sector and 5 per cent were from the commercial semi-state sector; 33 per cent were from organizations with less than 20 people; 31 per cent were from organizations with more than 20 and less than 100 people, leaving 36 per cent working in the organizations more than 100 people; 40 per cent held leaving certificate or below level education, 22 per cent held PLC, Certificate or diploma, and 38 per cent had college degrees. The average age was 40.59 years old (s.d. = 11.84) and the average working tenure was 11.44 years (s.d. = 9.99) (See Appendix B for respondent details and frequency tables

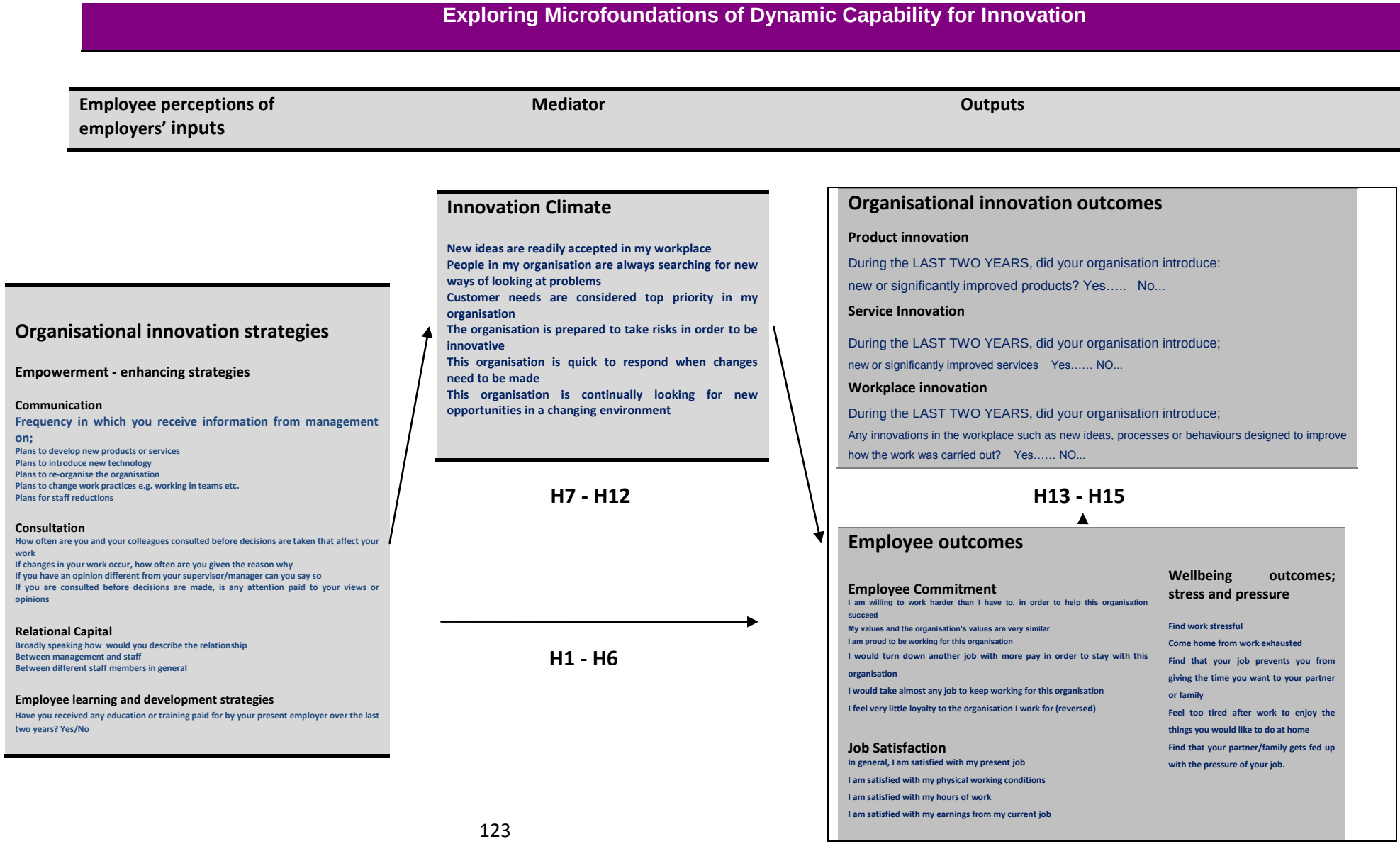
and Appendix C for demographic survey questions).

6.6 Measures

This section outlines how the research model is operationalized by depicting the measures that are used throughout the investigation. The measures in this study include questions on Likert and binary scales. This section details independent variables, mediators, dependent variables, control variables and factor analysis undertaken to check the factor structure of the measures.

Figure 6.2 outlines how the research model is operationalized and summaries the measures used in the investigation (See Appendix D for summary of survey questions used in this study)

Figure 6.2: Operationalising Research Model



6.6.1 Independent Variables

Four sets of independent variables were assessed; communication, consultation, relational climate and training.

Communication was measured by five items. Participants were asked to state the frequency in which they receive information from management on five aspects. They are;

1. 'Plans to develop new products or services',
2. 'Plans to introduce new technology',
3. 'Plans to re-organize the organization',
4. 'Plans to change work practices e.g. work in teams etc.' and
5. 'Plans for staff reductions'.

With each aspect, responses ranged from 1 (has not risen) to 4 (regular basis). The alpha coefficient for the scale was .79. This measure for communication was adapted from the British Workplace Employee Relations Survey (WERS), 1997.

Consultation was measured by four items. Participants were asked to indicate how they experience consultation in the organisation. The four questions are;

1. 'How often are you and your colleagues consulted before decisions are taken that affect your work',
2. 'If changes in your work occur, how often are you given the reason why',
3. 'If you have an opinion different from your supervisor/manager can you say so' and
4. 'If you are consulted before decisions are made, is any attention paid to your views or opinions'.

A five-point Likert scale was used ranging from 1 (never) to 5 (almost always). The alpha coefficient for the scale was .78. This measure for consultation was adapted from the British Workplace Employee Relations Survey (WERS), 1997.

Relational capital was measured by two items. Participants were asked to describe the relationships between staff and management in their workplace as well as between different staff members in general. A five-point Likert scale was used ranging from 1 (very bad) to 5 (very good). The alpha coefficient for the scale was .67. This measure for relational capital was adapted from the British Workplace Employee Relations Survey (WERS), 1997.

Training was assessed by a binary question. Participants were asked if they had received any education or training paid for or provided by their present employer over the last 2 years. Training was coded as 1 (yes) and 0 (no). This measure was adapted from the British Skills Survey, 1997.

6.6.2 Mediators

Innovation Climate was measured by six items adapted from Patterson et al.'s (2006) organisational climate measure (see Table 6.1). Participants were asked to rate the extent to which they agreed with each statement with responses ranging from 1 (strongly disagree) to 4 (strongly agree). These statements are:

1. 'New ideas are readily accepted in my workplace',
2. 'People in my organisation are always searching for new ways of looking at problems',
3. 'Customer needs are considered top priority in my organization',
4. 'This organization is prepared to take risks in order to be innovative',
5. 'This organization is quick to respond when changes need to be made' and
6. 'This organization is continually looking for new opportunities in a changing environment'.

The alpha co-efficient for the scale was 82. This measure was adapted from Paterson et al. (2005).

Overall, this section has detailed the key measures utilised for the current research including relevant Cronbach's alpha co-efficient which indicate the reliability (internal consistency) of constructs deployed. All constructs score above the commonly used threshold of .70 and the acceptable one of .60

6.6.3 Dependent Variables

Two sets of dependent variables were utilised in this study. They are organisational innovation outcomes and employee outcomes.

Organisational innovation outcomes

Three types of organizational innovation outcomes were assessed by three binary questions indicating new services, new products, and new workplace innovations. They are:
'During the last two years, did your organization introduce?

1) New or significantly improved services;
2) New or significantly improved products; and
3) Any innovations in the workplace such as new ideas, processes or behaviours that led to significant improvements in the way the work is carried out.'

These three dependent variables are coded with 1 indicating yes and 0 indicating no. The product and service innovation questions were adapted from Smith et al. (2005) who adapted them from Damanpour (1991). The workplace innovation question was developed by the NCPP based on research by Black and Lynch (2001, 2004), Lynch (2007) and Lam (2005).

Employee outcomes

Employee outcomes were assessed by three constructs, employee job satisfaction, employee commitment and wellbeing.

Job satisfaction was measured by four items. Participants were asked to indicate the extent to which they agree with the following four statements:

1. 'In general, I am satisfied with my present job',
2. 'I am satisfied with my physical working conditions',
3. 'I am satisfied with my hours of work' and
4. 'I am satisfied with my earnings from my current job'.

A four-point Likert scale was used ranging from 1 (strongly disagree) to 4 (strongly agree). Cronbach's alpha was used to assess the reliability of constructs. The coefficient for job satisfaction is .73 which exceeds the common used threshold of .70 and the acceptable one of .60.

The measure for job satisfaction was adapted from Cook et al. (1981) and Cammann et al. (1983).

Commitment was measured by six items. Participants were asked to indicate the extent to which they agree with the following six statements:

1. 'I am willing to work harder than I have to in order to help this organisation succeed',
2. 'My values and the organisation's values are very similar',
3. 'I am proud to be working in this organisation',
4. 'I would turn down another job with more pay in order to stay with this organisation',
5. 'I would take almost any job to keep working for this organisation' and
6. 'I feel very little loyalty to the organisation I work for' (reverse coded).

A four-point Likert scale was used ranging from 1 (strongly disagree) to 4 (strongly agree). The Cronbach's alpha coefficient for this six-item scale is .73. This measure of affective commitment was adapted from Meyer and Allen (1997).

Work pressure was measured by five items. Participants were asked to indicate how often they experience the following;

1. 'Find your work stressful',
2. 'Come home from work exhausted',
3. 'Find that your job prevents you from giving the time you want to your partner or family',
4. 'Feel too tired after work to enjoy the things you would like to do at home' and
5. 'Find that your partner/family gets fed up with the pressure of your job',

A five-point Likert scale was used ranging from 1 (never) to 5 (always). All of the above items were reverse coded. The alpha coefficient for the scale was .83. This measure was adapted from Netemeyer et al. (1996) and Danford et al. (2005).

6.6.4 Control Variables

Innovation and employee outcomes are a function of many factors. Therefore, a number of variables available in the data set were included to statistically control for these other effects. In each of the models, two sets of variables were controlled in the analysis. The first set of control variables measured characteristics of individuals that might be expected to affect their perceptions about innovation and their own experiences. The investigation controlled for gender (0 = male, 1= female), organizational tenure (years), education level (1 = None/Primary Certificate or equivalent to 7 = postgraduate), and job grades (1=employee; 2= supervisor; 3= middle management; and 4 = senior management). For the regression analysis, education and job grades were included as dummy variables. There were two dummy variables for education: one for those with Post Leaving Certificate (PLC) and diploma and one for those with a bachelor degree or above, excluding from the analysis those with leaving certificate and below level as a baseline category. There were three dummy variables for job grades: one for supervisor, another one for middle management, and the third one for senior management, excluding the employee category.

The second set of control variables included industry and firm characteristics that may have an effect on organizational innovation and employee outcomes. They were sector (1 = public; 2 = commercial semi-state sector; and 3 = private) and firm size (1="1-4"; 2="5-19"; 3="20-25"; 4="26-49"; 5="50-99"; 6="100-499"; 7="500+"). There were two dummy variables for sectors: one for the semi-state sector and the other for the private sector (excluding public sector as baseline category). Three dummy variables were created for firm size: one for small firms (1-19), the second one for medium firms (20-99) and the third one for large firms (100+) with small firms as the baseline category.

6.6.5 Factor Analysis

To check the factor structure of the measures (mainly for the Likert scales), a principal axis factor analysis using oblique rotation was performed by enforcing six factors. Each item was standardized first before the factor analysis was performed. This was done because not all of the measures used the same Likert-point. For example, communication was measured by

a four-point scale while wellbeing was measured on a five-point scale. The results are shown in Table 6.2. All of items loaded on to expected factors with factor loadings of .37 or above and with eigenvalues above 1.

Table 6.2: Exploratory Factor Analysis Results

Measures	Factor Loadings				
Work Pressure and Stress How often do you …					
Feel too tired after work to enjoy the things you would like to do at home	**.757**				
Find that your job prevents you from giving the time you want to your partner or family	**.721**				
Find that your partner/family gets fed up with the pressure of your job	**.687**				
Come home from work exhausted	**.679**				
Find your work stressful	**.624**				
Commitment					
I am proud to be working in this organisation		**.836**			
My values and the organisation's values are very similar		**.785**			
I am willing to work harder than I have to in order to help this organisation succeed		**.494**			-.104
I would turn down another job with more pay in order to stay with this organisation		**.481**			
I feel very little loyalty to the organisation I work for (reversed coded)		**.424**			
I would take almost any job to keep working for this organisation		**.368**			.102
Communication: How often do you receive information on…					
plans to re-organize the organization			**.780**		
plans to change work practices e.g. work in teams etc.			**.722**		
plans to introduce new technology			**.682**		
plans to develop new products or services			**.643**		.100
plans for staff reductions			**.479**		-.165
Consultation					
If changes in your work occur, how often are you given the reason why				**.768**	
How often are you and your colleagues consulted before decisions are taken that affect you work				**.706**	
If you are consulted before decisions are made, is any attention paid to your views or opinions				**.700**	
If you have an opinion different from your supervisor/manager can you say so				**.572**	
Job Satisfaction					
In general, I am satisfied with my present job					**.701**
I am satisfied with my physical working conditions					**.650**
I am satisfied with my hours of work		.175			**.624**
I am satisfied with my earnings from my current job					**.462**
Relational Capital: Broadly speaking, how would you describe the relationship …					
Between staff and management in your workplace					**.812**
Between different staff members in general					**.633**

6.7 Research Limitations

This study, relying on national evidence and employing quantitative methods, has a number of limitations. While the National Workplace Surveys have provided a unique resource for this study a consequence is that the research has been informed by broader pragmatic constraints related to the stakeholder consultation and design process and the measures deployed. With respect to methods, large scale scientific studies cannot definitively explain causality (Hesketh and Fleetwood, 2006). There may be many potential intervening variables and establishing causality is complicated both in theory and methodology so that it is not possible in a study such as this to show conclusively the processes through which associations are made. Building the organisational behavioural systems which support creative behaviours leading to innovation is not linear because the nature of organisations is complex and uncertain and human behaviour is unpredictable (Becker and Gerhart, 1996).

In this regard while a large quantitative survey such as this, provides an important foundation in investigating innovation correlations and relationships, it is acknowledged that these alone cannot provide the definitive answers or the explanation of underlying causal connections and mechanisms. While this study provides unique and important foundations, it is expected that future research could supplement the findings using longitudinal research and qualitative methodologies such as specific in-depth cases studies and interviews with key actors, in order to provide further causal explanations that reflect particular settings and surrounding contextual factors and influences. Finally, while the systematic approach to sampling associated with the National Survey may provide a strong basis for generalisation, the approach taken here is equally sympathetic to generalisations to theory in order to provide enhanced understanding (see chapter 9).

6.8 Summary

In summary, this chapter examined the key philosophical underpinnings of studies on organisational innovation and research in this area. While the preponderance of studies in organisational innovation come from a positivist tradition and adopt quantitative methodologies, it is evident that there are benefits in adopting both quantitative and qualitative methodologies. This research adopts a positivist approach and associated methods of research and analysis because of the benefits of such approaches in achieving the research objectives. The study is based on a large database of employee responses

from the National Workplace Survey of Employees (2009) a survey in which the researcher was centrally involved. The chapter outlined the research model and the proposed hypotheses which investigate the links between organisational innovation strategies and innovation outcomes, both organisational and employee outcomes: whether innovation climate mediates the relationship between organisational innovation strategies and innovation outcomes: and the association between employee outcomes and organisational outcomes. As a large national survey of employees across different sectors, the employee survey provides valuable and rare data and offers a unique empirical opportunity to explore employee perspectives on organisational innovation. It is expected that analysis of responses will make a unique contribution to understanding the dynamics of organisational innovation. The next chapter begins this process by presenting key findings from the investigation.

Chapter Seven: Data Analysis

7.1 Introduction

This chapter outlines the analysis of the data based on the model outlined in Figure 6.1 in the previous chapter. To test the model, the following analysis was undertaken. Firstly, descriptive analysis was conducted to present the mean, standard deviation and correlations between all the variables. Then hierarchical multiple regression analysis was used to test the hypotheses. Binary logistic regression was used for the binary organisational innovation outcomes, new services, new products, and new workplace innovations. Linear regression was used for the employee outcomes, job satisfaction, commitment and wellbeing. To test the mediating role of innovation climate in the relationship between innovation strategies and innovation outcomes, a mediation test was conducted following the four conditions described by Baron and Kenny (1986) and subsequently the Sobel test was used to assess the reliability of the model (Sobel, 1982).

7.2 Descriptive Analysis

Before beginning the analysis, the next section gives an overview of responses to each item from the National Workplace Survey of Employees (2009). Responses to all the items are outlined in accordance with the research model. Firstly, responses are outlined for organisational innovation strategies, i.e. communication, consultation, relational capital and training, followed by responses to innovation climate questions. Then responses for organisational innovation outcomes are outlined, including new services, new products and workplace innovations and finally responses to employee outcomes, job satisfaction, employee commitment and wellbeing. Tables 7.1 to 7.6 present the individual items descriptive analysis.

7.2.1 Organisational Innovation Strategies

The study will assess the link between organisational innovation strategies and innovation outcomes. Based on the literature and supporting evidence form the National Workplace Survey of Employers (2009) the organisational innovation strategies associated with innovation outcomes identified for investigation in this study are empowerment–enhancing strategies, communication and consultation, relational capital and learning strategies. Tables 7.1 to 7.4 outline the survey responses to each of these items.

Table 7.1: Communication Responses

Items for measuring communication How often do you receive the following information from management?	Has not Risen	Hardly Ever	Occasionally	Regular Basis
Plans to develop new products or services	5%	21%	29%	45%
Plans to introduce new technology	8%	26%	29%	37%
Plans to re-organize the organization	8%	30%	30%	22%
Plans to change work practices e.g. work in teams etc.	8%	25%	31%	36%
Plans for staff reductions	13%	33%	27%	27%

As communication frequency has been identified in the literature as an important organisational innovation strategy (Slappendel, 1996; Read, 2000; Shipton et al., 2006), this study investigates the link between levels of communication and climate for innovation and innovation outcomes. From these responses, it is evident that substantial proportions of employees surveyed do not receive information about their organisation's future plans including innovation plans on a regular basis. For example, 50% occasionally or hardly ever receive information on plans to develop new products or services and 55% say they do not receive information on the introduction of new technology on a regular basis. Significantly also, employees do not receive information regularly on other organisational matters that directly affect their own work, such as plans to reorganise the organisation, plans to change work practices and plans for staff reductions.

Table 7.2: Consultation Responses

Items for Measuring Consultation	Never	Hardly Ever	Sometimes	Often	Always
How often are you and your colleagues consulted before decisions are taken that affect your work	12%	14%	26%	20%	28%
If changes in your work occur, how often are you given the reason why	9%	11%	21%	17%	42%
If you have an opinion different from your supervisor/manager can you say so	4%	3%	12%	11%	70%
If you are consulted before decisions are made, is any attention paid to your views or opinions	9%	10%	29%	14%	38%

Providing for employee consultation is an important empowerment-enhancing strategy for innovation (Damampour, 1991; Hage 1999; Conway and McMackin, 1997; Read 2000; Appelbaum, 2000; Black and Lynch, 2004; Shipton et al., 2006; Lynch, 2007; McLeod and Clarke, 2009; Subramony, 2009). The findings on meaningful levels of consultation are mixed as shown in Table 7.2. While 26% say that they are hardly ever or never consulted, and 20% claim that if changes occur, they are not given the reasons why, it is encouraging that 81% say that if they have an opinion different from their manager, they can say so (70% always and 11% often). In relation to meaningful consultation, i.e. whether attention is paid to employees' views, 52% respond either always or often, but 19% say that their views are rarely or never taken on board. This study will investigate the association between levels of consultation and innovation outcomes as consultation has been shown to play a critical role in fostering innovation (Read, 2000; Lynch 2007; McLeod and Clarke, 2009; Subramony, 2009).

Table 7.3: Relational Capital Responses

items for measuring relational capital broadly speaking, how would you describe the relationship…	Very Bad	Bad	ng nb	Good	Very Good
Between staff and management in your workplace	3%	6%	16%	43%	32%
Between different staff members in general	1%	2%	7%	51%	39%

Relational capital has been identified as one of the important underlying processes in dynamic capability for innovation (Bowman and Ambrosini, 2003; Teece, 2007) and an important strategy for building organisational innovation (Hage 1999; Damampour 1991; Conway and McMackin 1997; Read, 2000; McLeod and Clarke, 2009). Relational capital is also very strongly associated with innovation climate (James and James, 1989; Amabile, 1993; Anderson and West, 1998; Ekvall and Ryhammer 1999; Patterson et al., 2005; Shipton et al., 2006; Hunter et al., 2007). The results in Table 7.3 suggest that relationships between staff and managers and relationships between staff are generally good or very good in the Irish workplaces surveyed. Relationships between staff are particularly positive at 90% for respondents indicating that they are good or very good. This study will investigate the link between strong relational capital and innovation climate and innovation outcomes (Barsade, 2002; Askanasy and James, 2007; Mossholder, 2011).

Table 7.4: Training Responses

Item for Measuring Training	Yes	No
Have you received any education or training paid for or provided by your present employer over the last 2 years?	48%	52%

Purposeful learning opportunities are seen as important underlying processes in developing dynamic capability for innovation (Eisenhardt and Martin, 2000; Zollo and Winter, 2002; Teece, 2007). Human capital development through workforce training and employer guided training is also an important organisational innovation strategy (Hage, 1999; Leavy and Jacobson 1997; Conway and McMackin, 1997; Lundvall, 1998; Appelbaum, 2000; Read, 2000; Lam, 2005; Lynch, 2007). In this context, the level of training provided to Irish employees is low and has not increased since these surveys were first conducted in 2003 (The Changing Workplace: A Survey of Employee's Views and Experiences, ESRI, NCPP, 2004). The study investigates the association between training as an organisational innovation strategy and innovation climate and innovation outcomes, both organisational and employee outcomes.

7.2.2 Innovation Climate

The next section outlines the responses to innovation climate questions. In this research, strength of innovation climate has been identified as a potentially critical element in understanding how and why certain organisational strategies designed by managers have significant effects on innovation outcomes (West and Richter, 2007; Takeuchi et al., 2009). Innovation Climate was measured by six items and the alpha co-efficient for the scale was .82 (see section 6.5.2 and Table 6.1). Participants were asked to rate the extent to which they agreed with each statement with responses ranging from 1 (strongly disagree) to 4 (strongly agree).

Table 7.5: Innovation Climate Responses

Items for Measuring Innovation Climate	Disagree	Agree
New ideas are readily accepted in my workplace	23%	77%
People in my organisation are always searching for new ways of looking at problems	22%	78%
Customer needs are considered top priority in my organization	9%	91%
This organisation is prepared to take risks in order to be innovative	28%	72%
This organisation is quick to respond when changes need to be made	38%	62%
This organisation is continually looking for new opportunities in a changing environment	18%	82%

These results are positive and show that innovation climate is strong in Irish workplaces. The presence of a strong innovation climate may suggest that strategies designed by managers are being experienced by the employees (Anderson and West, 1998). This research will investigate whether innovation climate acts as a mediator in the relationship between organisational innovation strategies and organisational innovation outcomes such as the introduction of new products and services and new workplace innovations. Importantly, it will also assess the relationship between innovation climate and employee outcomes such as increased commitment, job satisfaction and wellbeing. Such employee outcomes, it is proposed not only have a positive impact on employees but also help to increase organisational productivity, in this case innovation output (Brown and Leigh, 1996; Neal and Griffin, 1999; Mossholder et al., 2011).

7.2.3 Organisational Innovation Outcomes

Three types of organizational innovation outcomes were assessed: the introduction of new services, new products, and new workplace innovations during the past two years. As indicated in Table 7.6 respondents reported high levels of organisational innovation outcomes.

Table 7.6: Organisational Outcomes Responses

Organisational Innovation Outcomes	Yes	No
New Services	46%	54%
New Products	44%	56%
Workplace Innovations	42%	58%

The findings are significant for the purposes of this study which aims to investigate the factors which are linked to increased innovation outcomes. There is remarkable similarity between responses to all innovation outcomes, with slightly higher levels reporting that their organisation introduced new services in the past two years than new products or workplace innovations. These levels of innovation include respondents from the public sector. It would be expected that service innovation would be stronger in the public service and that may account for the higher levels of service innovation recorded. For this reason sector is one of the key control variables used in the current study.

7.2.4 Employee Outcomes

Employee outcomes were assessed by three constructs, employee job satisfaction, employee commitment and wellbeing. The study will investigate whether organisational innovation strategies are linked to employee outcomes and whether innovation climate mediates the relationship between strategies and employee outcomes. Investigating the link between organisational innovation strategies and measures that reflect employee outcomes such as job satisfaction, commitment and wellbeing is important because of the importance of wellbeing and positive affective tone to creativity and innovation in the literature (James and James, 1989; Isaksen et al., 1998; Chadwick and Dabu, 2009).

Table 7.7: Job Satisfaction Responses

Items for Measuring Job Satisfaction	Disagree	Agree
In general, I am satisfied with my present job	7%	93%
I am satisfied with my physical working conditions	8%	92%
I am satisfied with my hours of work	13%	87%
I am satisfied with my earnings from my current job	30%	70%

From these responses it is evident that there are high levels of job satisfaction among Irish workers, in particular high levels of satisfaction with current job and physical working conditions. There is less satisfaction with hours of work and considerably less satisfaction with levels of earnings. This latter may reflect the early effects of the recession which began in September 2008. The survey was administered between March and June 2009. High levels of job satisfaction recorded are positive for this study on innovation as there are a number of previous studies that have shown that where the majority of employees experience job satisfaction, they will endorse rather than resist innovation (Shipton et al.,

2006; Takeuchi et al., 2009) and will give extra discretionary effort to their work (Brown and Leigh, 1996; Neal and Griffin, 1999).

Table 7.8: Commitment Responses

Items for Measuring Commitment	Disagree	Agree
I am willing to work harder than I have to in order to help this organisation succeed	11%	89%
My values and the organisation's values are very similar	15%	85%
I am proud to be working in this organisation	8%	92%
I would turn down another job with more pay in order to stay with this organisation	48%	52%
I would take almost any job to keep working for this organisation	56%	44%
1 feel very little loyalty to the organisation I work for (R)	85%	15%

Levels of commitment are also very high in Irish workplaces, including loyalty to the organisation and identity with the organisation's values. The concern for earnings is also reflected in these responses as indicated by the lack of enthusiasm of 48% of respondents to turn down another job with more pay in order to stay working for their current organisation. Equally while respondents are highly committed to their organisation, their commitment to their current role in the organisation is strong as 56% of respondents say that they would not take any job to stay working for their current organisation. The high levels of commitment recorded in these surveys are a positive finding in respect of innovation as from previous studies it would seem that high levels of commitment are required for innovation to occur (Blau, 1964; Takeuchi et al., 2009).

Table 7.9: Wellbeing Responses

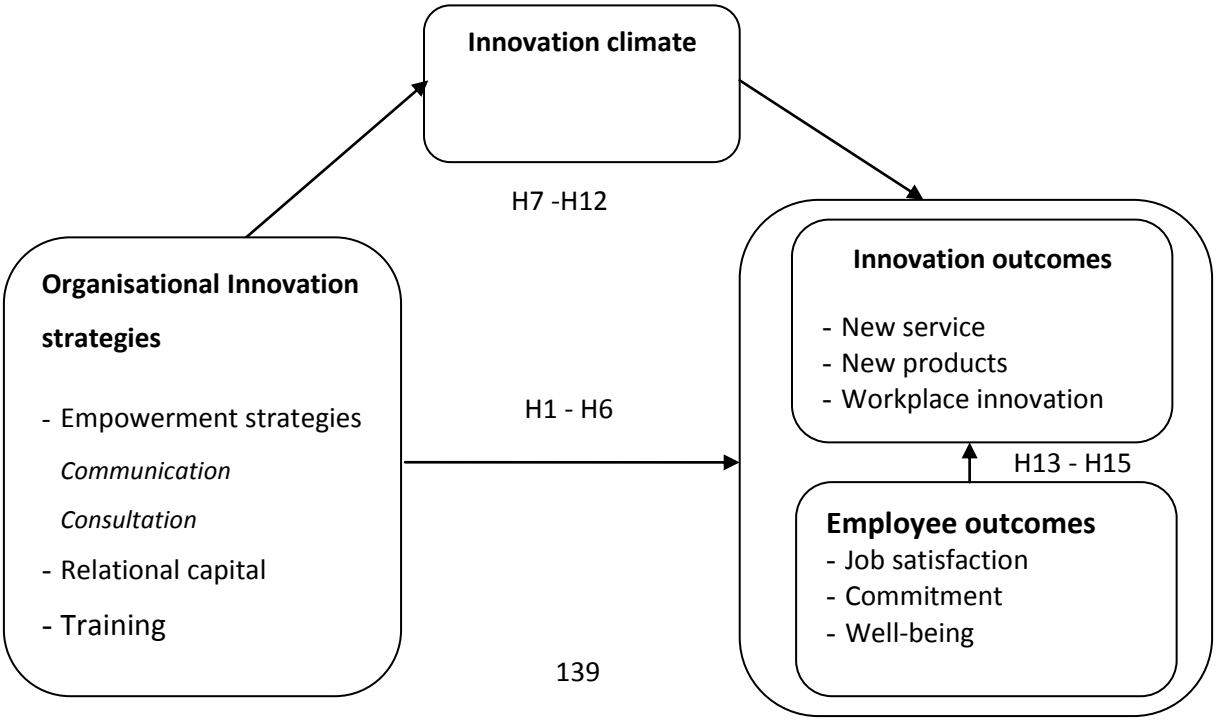
Items for Measuring Wellbeing How often do you …	Never	Hardly Ever	Sometimes	Often	Always
Find your work stressful	13%	12%	48%	16%	11%
Come home from work exhausted	12%	11%	46%	17%	15%
Find that your job prevents you from giving the time you want to your partner or family	35%	17%	31%	10%	7%
Feel too tired after work to enjoy the things you would like to do at home	24%	17%	39%	12%	8%
Find that your partner/family gets fed up with the pressure of your job	47%	18%	24%	6%	5%

These responses suggest that levels of wellbeing in Irish workplaces are a cause for concern. This may reflect the effects of the recession on work pressure and the reduced bargaining power of workers. Combining the responses for those who responded often and always, 20% feel too tired to enjoy other activities at home, 17% say that the job prevents them for spending time with family and partners, 11% say that their partner complains about the level of pressure in the job. More importantly, 32% say that they come home for work exhausted often or always and 25% say that they find work stressful. As wellbeing is seen to be important for innovation (James and James, 1989; Amabile, 1993; Anderson and West, 1998; Ekvall and Ryhammer 1999; Patterson et al., 2005; Shipton et al., 2006; Hunter et al., 2007), the investigation examines the association between organisational innovation strategies and innovation climate on wellbeing. It will also examine the relationship between wellbeing and the introduction of new products, services and workplace innovations.

7.3 Bivariate Analysis

The next section outlines the analysis of the data based on the model outlined in Figure 1 and the hypotheses 1-13. Figure 7.1 summarises the research model as explained in Chapter 6 and Table 7.11 summarises the hypotheses which were investigated in accordance with the research model.

Figure 7.1: Theoretical Model with Proposed Hypotheses



The aim of the research is to assess the association between organisational innovation strategies, innovation climate, and innovation outcomes. Following the logic of Baron and Kenny (1986) table 7.10 outlines the hypotheses under the following broad headings:

1. Organisational innovation strategies and organisational innovation outcomes (H1a-H3d)
2. Organisational innovation strategies and employee outcomes (H4a-H6d)
3. Innovation climate as a mediator in the relationship between organisational innovation strategies and organisational innovation outcomes (H7a-H9d)
4. Innovation climate as a mediator in the relationship between organisational innovation strategies and employee outcomes (H10a-H12d)
5. Employee outcomes and organisational innovation outcomes (H13a-H15c).

Table 7.10: Hypotheses

Hypotheses	
1.	**Organisational innovation strategies and organisational innovation outcomes.**
	1. Organisational innovation strategies, i.e. communication (1a), consultation (1b), relational capital (1c) and training (1d), are positively associated with the introduction of new services.
	2. Organisational innovation strategies, i.e. communication (2a), consultation (2b), relational capital (2c) and training (2d), are positively associated with the introduction of new products.
	3. Organisational innovation strategies, i.e. communication (3a), consultation (3b), relational capital (3c) and training (3d), are positively associated with the introduction of new workplace innovations.
2.	**Organisational innovation strategies and employee outcomes**
	4. Organisational innovation strategies, i.e. communication (4a), consultation (4b), relational capital (4c) and training (4d), are positively associated with employee job satisfaction.
	5. Organisational innovation strategies, i.e. communication (5a), consultation (5b), relational capital (5c) and training (5d), are positively associated with employee commitment.
	6. Organisational innovation strategies, i.e. communication (6a), consultation (6b), relational capital (6c) and training (6d), are positively associated with employee wellbeing.
3.	**Innovation climate acts as a mediator in the relationship between organisational innovation strategies and organisational innovation outcomes**
	7. Innovation climate mediates the relationship between organisational innovation strategies i.e. communication (7a), consultation (7b), relational capital (7c) and training (7d) and the introduction of new services.
	8. Innovation climate mediates the relationship between organisational innovation strategies i.e. communication (8a), consultation (8b), relational capital (8c) and training (8d) and the introduction of new products.
	9. Innovation climate mediates the relationship between organisational innovation strategies i.e. communication (9a), consultation (9b), relational capital (9c) and training (9d) and new workplace innovations
4.	**Innovation climate acts as a mediator in the relationship between organisational innovation strategies and employee outcomes**
	10. Innovation climate mediates the relationship between organisational innovation strategies i.e. communication (10a), consultation (10b), relational capital (10c) and training (10d) and employee job satisfaction.
	11. Innovation climate mediates the relationship between organisational innovation strategies i.e. communication (11a), consultation (11b), relational capital (11c) and training (11d) and employee commitment.
	12. Innovation climate mediates the relationships between organisational innovation strategies i.e. communication (12a), consultation (12b), relational capital (12c) and training (12d) and employee wellbeing.
5.	**Employee outcomes and organisational innovation outcomes**
	13. Employee's outcomes, i.e. job satisfaction (13a), commitment (13b) and wellbeing (13c) are positively related to the introduction of new services.
	14. Employee's outcomes, i.e. job satisfaction (14a), commitment (14b) and wellbeing (14c) are positively related to the introduction of new products.
	15. Employee's outcomes, i.e. job satisfaction (15a), commitment (15b) and wellbeing (15c) are positively related to the introduction of workplace innovations.

The following tables outline descriptive statistics and correlations in order of significance: Table 7.11 outlines the descriptive statistics, i.e. means, standard deviation and correlations among the variables and Table 7.12 outlines the correlations in order of significance. The measurement of the constructs investigated was outlined in detail in the methodology chapter, chapter 6 (see Figure 6.2 for an overview of the measures used). Overall, all constructs score above the commonly used Cronbach's alpha co-efficient threshold of .70 and the acceptable one of .60. For example innovation climate was measured by a six item scale and the alpha co-efficient for the scale was .82.

Table 7.11 Descriptive Statistics and Correlations

Variables		Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.	New Services	.531	.499																
2.	New Products	.563	.496	.445**															
3.	Workplace Innovation	.593	.491	.380**	.339**														
4.	Job Satisfaction	3.105	.497	.103**	.074**	.161**	(.73)												
5.	Commitment	2.917	.457	.130**	.100**	.200**	.538**	(.73)											
6.	Wellbeing	3.348	.909	-.022	-.003	-.001	.310**	.202**	(.83)										
7.	Innovation Climate	2.954	.507	.220**	.241**	.312**	.394**	.510**	.132**	(.82)									
8.	Communication	2.965	.693	.265**	.231**	.285**	.138**	.159**	-.033*	.286**	(.79)								
9.	Consultation	3.757	.990	.150**	.152**	.271**	.345**	.370**	.234**	.423**	.355**	(.78)							
10.	Relational Capital	4.099	.754	.087**	.084**	.182**	.321**	.396**	.269**	.426**	.122**	.468**	(.67)						
11.	Training	.502	.500	.177**	.091**	.188**	.083**	.059**	-.045**	.061**	.179**	.114**	.031						
12.	Gender	.487	.500	-.008	-.084**	-.017	.035*	.034*	0	.001	-.036*	-.051**	.046**	-.005					
13.	Tenure (years)	11.341	9.868	.032	-.031	-.013	.017	.047**	.006	-.048**	.109**	.028	-.100**	.021	-.105**				
14.	Education	4.844	1.426	.049**	.015	.042*	.047**	-.033*	-.119**	-.049**	.117**	.067**	-.058**	.144**	.066**	-.112**			
15.	Grades	1.707	1.035	.082**	.073**	.096**	.070**	.095**	-.145**	.051**	.202**	.191**	.004	.109**	-.153**	.224**	.246**		
16.	Sector	2.353	.907	-.031	.183**	.012	.037*	-.008	.045**	.194**	-.042*	.078**	.102**	-.090**	-.203**	-.202**	-.121**	.01	
17.	Firm Size	4.132	2.028	.140**	.105**	.125**	.009	-.088**	-.103**	-.01	.216**	-.044**	-.187**	.139**	-.078**	.110**	.162**	.073**	-.111**

Note: N=3724 (Listwise). ** p<.01, * p<.05, (two-tailed tests). The numbers in the brackets are the Cronbach's Alphas.
For gender, 1= female, 0 = male. For training, 1 = yes, 0 = no.

Table 7.12: Correlations in Order of Significance

Variables		*r*	*p*
Innovation Climate	Commitment	.510	**
	Relational capital	.426	**
	Consultation	.423	**
Relational capital	Commitment	.396	**
Innovation Climate	Job satisfaction	.394	**
Consultation	Commitment	.370	**
	Job satisfaction	.345	**
Relational capital	Job satisfaction	.321	**
Innovation Climate	Workplace innovation	.312	**
Communication	Innovation Climate	.286	**
	Workplace innovation	.285	**
Consultation	Workplace innovation	.271	**
Communication	New services	.265	**
Innovation climate	New products	.241	**
Communication	New products	.231	**
Innovation Climate	New Services	.220	**

Note: ** p<.01

The analysis indicates a number of statistically significant and important associations. There is a high correlation between innovation climate and employee outcomes particularly commitment (*r* = .510, p< .01) and job satisfaction *(r* = .394, p< .01). Innovation climate is also strongly correlated with organisational innovation outcomes; workplace innovation (*r* = .312, p< .01), new products (*r* = .241, p< .01) and new services (*r* = .220, p< .01). Organisational innovation strategies, relational capital and consultation have the highest correlation with innovation climate and employee outcomes. Relational capital is very highly correlated with innovation climate *(r* = .426, p< .01) and employee outcomes, commitment *(r* = .396, p< .01) and job satisfaction (*r* = .321, p< .01). There is a high correlation between consultation and employee outcomes, commitment *(r* = .370, p< .01) and job satisfaction *(r* = .345, p< .01). Consultation is also highly correlated with innovation climate *(r* = .425, p< .01). In relation to organisational innovation outcomes, as well as innovation climate, the organisational innovation strategy of communication has the highest correlation with new services (*r* = .265, p< .01) new products (*r* = .241, p< .01) and workplace innovations *(r* = .271, p< .01). All the correlations tested in the model were significant to different degrees. Regression analysis was conducted for further investigation of the conceptual model and key hypotheses.

7.4 Regression Analysis

Following the descriptive analysis, hierarchical multiple regression analysis was used to test the hypotheses. Binary logistic regression was used for the binary organisational innovation outcomes i.e. new service, new products and workplace innovation, and linear regression was used for the employee outcomes i.e. job satisfaction, commitment and wellbeing. To test the mediating role of innovation climate in the relationship between innovation strategies and innovation outcomes, a mediation test was conducted following the four conditions described by Baron and Kenny (1986) and subsequently the Sobel test was used to assess the reliability of the model (Sobel, 1982). The Sobel test has been the used in other studies to test the reliability of the mediation model (Takeuchi et al., 2009).

7.4.1 Regression Analysis for Organisational Innovation Outcomes (Hypotheses 1-3)

The three dependent variables for assessing organisational innovation outcomes were the introduction of new services, new products, and new workplace innovations. They were binary. Therefore, binary logistic regression analysis was employed. The independent variables, i.e. the organisational innovation strategies in this study, communication and consultation, relational capital and training were added after controlling for two sets of individual and industry characteristic variables. This was followed by adding innovation climate in the third step. The following three sub-sections show the results.

7.4.1.1 Regression analysis for service innovation (H1a-H1d)

The binary logistic regression results presented in Table 7.13 examine whether or not an organisation introduced new services. Model 1.1 includes the various control variables as predictors, and model 1.2 adds the independent variables, i.e. communication, consultation, relational capital and training. Entering these predictors, the model fitness increased significantly ($\Delta \chi^2$=404.94, p<.001). Model 1.2 shows that, with a wide variety of control variables held constant, respondents who perceive more communication, consultation, training opportunities and relational capital were more likely to produce new services (*B* = .641, *p*<.001 for communication; *B* = .097, *p*<.05 for consultation; *B* = .192, *p*<.001 for relational capital; and *B* = .553, *p*<.001 for training). In the third step, innovation climate was added and the results are shown under Model 1.3. It shows that innovation climate was highly associated with new services (*B* = .768, *p*<.001). Therefore, hypotheses 1a to 1d which propose the positive relationships between innovation strategies, i.e.

communication, consultation, relational capital and training with organisational innovation outcome - new services were supported.

With respect to the other variables shown in the Model 1.1, there were some statistically significant coefficients. For example, gender (B = .104, p<.01) shows a significant and positive impact on innovation in services. As females were coded 1 and males 0, females are more likely to be innovative in services than males. In addition, the results show that management grades including supervisors, middle management and senior management are more likely to record innovations in services than employees (B = .206, p<.05 for supervisor; B = .383, p<.001 for middle management; B = .419, p<.001 for senior management). This could be interpreted as reflecting proximity to knowledge concerning innovation or reflecting bias in more senior reporting of organisational outcomes (Guest, 2011). The semi-state commercial sector is more likely to record innovations in services than the public sector (B = .356, p<.05) but the private sector is not much different from the public sector in the introduction of new services (B = -.098, n.s.). In relation to firm size, both medium and large firms are more likely to introduce new services than small firms (B = .254, p<.001 for medium firms; B = .539, p<.001 for large firms).

Table 7.13: Results of Binary Logistic Regression Analysis Predicting Service Innovation (H1a-H1d)

Variables	New Service		
	Model 1.1	Model 1.2	Model 1.3
Intercept/constant	-.286** (.103)	-3.411*** (.238)	-4.412*** (.264)
Control			
Gender	.104† (.062)	.098 (.065)	.065 (.066)
Tenure	-.001 (.003)	-.001 (.003)	-.001 (.003)
Education dummy (PLC and Diploma)	.058 (.080)	.020 (.084)	.044 (.084)
Education (College degrees)	.092 (.071)	.000 (.075)	.040 (.076)
Job grade dummy (supervisor)	.206* (.095)	.069 (.100)	.089 (.101)
Job grade dummy (middle management)	.383*** (.087)	.206* (.091)	.246** (.093)
Job grade dummy (senior management)	.419*** (.113)	.059 (.120)	.062 (.121)
Sector dummy (semi-state)	.356* (.143)	.373* (.149)	.319* (.151)
Sector dummy (private)	-.098 (.067)	-.065 (.071)	-.198** (.073)
Firm size dummy (medium)	.254*** (.073)	.185* (.077)	.158* (.078)
Firm size dummy (large)	.539*** (.073)	.358*** (.079)	.333*** (.080)
Predictor			
Communication		.641*** (.050)	.557*** (.051)
Consultation		.097* (.038)	.007 (.039)
Relational capital		.192*** (.048)	.048 (.051)
Training		.553*** (.063)	.560*** (.064)
Mediator			
Innovation climate			.768*** (.076)
Likelihood-ratio χ^2	114.88***	519.82***	626.50***
Log-likelihood	6463.75	6058.81	5952.14
Pseudo R^2	.03	.14	.17
$\Delta\chi^2$		404.94***	106.68***

Note: Unstandardized coefficients are reported. Standardized errors are in parentheses. N = 4766 (Listwise)

*** p<.001, ** p<.01, * p<.05, † p<.10. All tests were two-tailed.

7.4.1.2 Regression analysis for product innovation (H2a-H2d)

Following the analysis for service innovation, regression analysis was undertaken to assess the second area of organisational innovation outcomes: product innovation. The binary logistic regression results presented in Table 7.14 explore the introduction of new products. Similar to the results for new services, results in Model 2.2 show respondents who record more communication, consultation, relational capital and training opportunities, were more likely to produce new products (B = .598, p<.001 for communication; B = .114, p<.01 for consultation; B = .093, p<.10 for relational capital; B = .259, p<.001 for training). In the third step, innovation climate was added and the results are shown under Model 2.3. It shows that innovation climate was highly associated with new products (B = .741, p<.001). Therefore, hypotheses 2a to 2d which propose the positive relationships between innovation strategies, i.e. communication, consultation, relational capital and training with the organisational innovation outcome of new products were supported.

With respect to the other variables shown in the Model 2.1, there were some statistically significant coefficients. For example, gender (B = -.122, p<.10) shows a significant and negative impact on innovation in products. As females were coded 1 and males 0, male respondents are more likely to be innovative in products than females. In addition, akin to service innovation findings, the results show that management grades including supervisors, middle management and senior management are more likely to perceive that their organisation introduced new products than employees (B = .255, p<.05 for supervisor; B = .180, p<.10 for middle management; B = .466, p<.001 for senior management). Both the semi-state commercial sector and private sector are more likely to be innovative in products than the public sector (B = .551, p<.001 for semi-state commercial sector; B = .861, p<.001 for private sector). In relation to firm size, both medium and large firms are more likely to introduce new products than small firms (B = .222, p<.01 for medium firms; B = .625, p<.001 for large firms).

Table 7.14: Results of Binary Logistic Regression Analysis Predicting Product Innovation (H2a-H2d)

Variables	New Products		
	Model 2.1	Model 2.2	Model 2.3
Intercept/constant	-.609*** (.119)	-3.140*** (.264)	-4.117*** (.293)
Control			
Gender	-.122† (.071)	-.129† (.073)	-.165* (.074)
Tenure	-.006 (.004)	-.008* (.004)	-.007† (.004)
Education dummy (PLC and Diploma)	.122 (.091)	.084 (.094)	.107 (.095)
Education (College degrees)	.008 (.082)	-.062 (.085)	-.019 (.086)
Job grade dummy (supervisor)	.255* (.110)	.164 (.113)	.170 (.114)
Job grade dummy (middle management)	.180† (.099)	.027 (.103)	.054 (.105)
Job grade dummy (senior management)	.466*** (.131)	.158 (.137)	.149 (..139)
Sector dummy (semi-state)	.551*** (.159)	.574*** (.163)	.522** (.165)
Sector dummy (private)	.861*** (.079)	.906*** (.082)	.796*** (.084)
Firm size dummy (medium)	.222** (.084)	.168† (.087)	.135 (.087)
Firm size dummy (large)	.625*** (.085)	.474*** (.090)	.446*** (.091)
Predictor			
Communication		.598*** (.056)	.517*** (.057)
Consultation		.114** (.042)	.032 (.044)
Relational Capital		.093† (.054)	-.049 (.056)
Training		.259*** (.071)	.257*** (.072)
Mediator			
Innovation climate			.741*** (.085)
Likelihood-ratio χ^2	223.15***	437.35***	516.67***
Log-likelihood	5006.95	4792.74	4713.42
Pseudo R^2	.08	.15	.17
$\Delta \chi^2$		214.20***	79.32***

Note: Unstandardized coefficients are reported. Standardized errors are in parentheses. N = 3821 (Listwise)

*** p<.001, ** p<.01, * p<.05, † p<.10. All tests were two-tailed.

7.4.1.3 Regression analysis for workplace innovation (H3a-H3d)

Following product and service innovation, regression analysis was then undertaken to assess the third area of organisational innovation outcomes: workplace innovation. The binary logistic regression results presented in Table 7.15 explore the introduction of new workplace innovations. Similar to the results for new services and new products, results in Model 3.2 show all four organisational innovation strategies were positively associated with the organisational outcome of workplace innovation (B = .619, p<.001 for communication; B = .329, p<.001 for consultation; B = .290, p<.001 for relational capital; B = .595, p<.001 for training). In the third step, innovation climate was added and the results are shown under Model 3.3. It shows that innovation climate was highly associated with workplace innovation (B = .968, p<.001). Therefore, hypotheses 3a to 3d which propose that there is a positive relationship between innovation strategies, i.e. communication, consultation, relational capital and training and the organisational innovation outcome of workplace innovation were supported.

With respect to the other variables shown in the Model 3.1, there were some statistically significant coefficients. Similar to the impact on new services and new products, management grades were found to have an impact on workplace innovation. Supervisors, middle management and senior management are more likely to record workplace innovations than employees (B = .296, p<.01 for supervisor; B = .314, p<.01 for middle management; B = .607, p<.001 for senior management). In relation to firm size, both medium and large firms are more likely to introduce workplace innovation than small firms (B = .352, p<.001 for medium firms; B = .514, p<.001 for large firms). Differently, gender and sector do not have any impact on workplace innovation.

Table 7.15: Results of Binary Logistic Regression Analyses Predicting Workplace Innovation (H3a-H3d)

Variables	New Process/Ideas		
	Model 3.1	Model 3.2	Model 3.3
Intercept/constant	-.139 (.103)	-4.484*** (.249)	-5.814*** (.282)
Control			
Gender	.099 (.062)	.097 (.067)	.058 (.068)
Tenure	-.009** (.003)	-.010** (.003)	-.010** (.004)
Education dummy (PLC and Diploma)	.081 (.080)	.035 (.086)	.067 (.088)
Education (College degrees)	.068 (.072)	-.039 (.077)	.012 (.079)
Job grade dummy (supervisor)	.296** (.097)	.139 (.103)	.166 (.105)
Job grade dummy (middle management)	.314*** (.087)	.085 (.094)	.128 (.096)
Job grade dummy (senior management)	.607*** (.118)	.105 (.127)	.110 (.128)
Sector dummy (semi-state)	.220 (.142)	.208† (.150)	.134 (.154)
Sector dummy (private)	.093 (.067)	.123 (.073)	-.040 (.075)
Firm size dummy (medium)	.352*** (.037)	.346*** (.079)	.325*** (.080)
Firm size dummy (large)	.514*** (.074)	.422*** (.082)	.400*** (.083)
Predictor			
Communication		.619*** (.050)	.515*** (.051)
Consultation		.329*** (.039)	.225*** (.040)
Relational Capital		.290*** (.049)	.114* (.052)
Training		.595*** (.065)	.606*** (.066)
Mediator			
Innovation climate			.968*** (.080)
Likelihood-ratio χ^2	103.79***	734.51***	891.63***
Log-likelihood	6448.90	5818.18	5661.27
Pseudo R^2	.03	.19	.23
$\Delta\chi^2$		630.72***	156.91***

Note: Unstandardized coefficients are reported. Standardized errors are in parentheses. N = 4827 (Listwise)

*** p<.001, ** p<.01, * p<.05, † p<.10. All tests were two-tailed.

This section outlines the results of regression analysis to assess organisational innovation outcomes, new products, new services and new workplace innovations. The next section will outline the results of regression analysis in respect of employee outcomes job satisfaction, commitment and wellbeing.

7.4.2 Regression Analysis for Employee Outcomes (Hypotheses 4-6)

Following the regression analysis to assess organisational innovation outcomes, regression analysis was then undertaken for assessing employee outcomes. The three dependent variables for assessing employee outcomes were job satisfaction, commitment and wellbeing. They were continuous. Therefore, the hierarchical multiple linear regression analysis method was employed. Independent variables, i.e. innovation strategies in this study, communication consultation, relational capital and training were added after controlling for two sets of individual and industry characteristic variables. This was followed by adding innovation climate. The following three sub-sections show the results.

7.4.2.1 Regression analysis for job satisfaction (H4a-H4d)

The hierarchical linear regression results predicting employee job satisfaction are presented in Table 7.16. Model 4.1 includes the various control variables as predictors, and Model 4.2 adds the independent variables, i.e. communication, consultation, relational capital and training. Results under Model 4.2 show that, with a wide variety of control variables held constant, consultation, relational capital and training opportunities, were positively associated with employee job satisfaction (β = .230, p<.001 for consultation; β = .218, p<.001 for relational capital; β = .029, p<.05 for training). The beta coefficient between communication and employee job satisfaction was not significant (β = .012*, n.s.*). In the third step, innovation climate was added and the results are shown under Model 4.3. It shows that innovation climate was highly associated with employee job satisfaction (β =.260, p<.001). Therefore, hypotheses 4b to 4d which propose the positive relationship between innovation strategies, i.e. consultation, relational capital and training with employee job satisfaction were supported. Hypothesis 4a proposing the positive relationship between communication and job satisfaction was not supported.

With respect to the other variables shown in Model 4.1, there were some statistically significant coefficients. For example, gender (β =.068, p<.001) shows a significant and positive impact on job satisfaction. As females were coded 1 and male 0, females are more likely to be satisfied with their jobs than man. In addition, the results show that employees working in both the semi-state commercial and private sectors are more likely to be satisfied than those working in the public sector (β = .044, p<.01 for semi-state commercial sector; β = .045, p<.01 for private sector).

Table 7.16: Results of Hierarchical Linear Regression Analysis Predicting Job Satisfaction (H4a-H4d)

Variables	Job Satisfaction		
	Model 4.1	Model 4.2	Model 4.3
Control			
Gender	.068***	.055***	.043**
Tenure	.007	.024†	.026†
Education dummy (PLC and Diploma)	-.017	-.016	-.010
Education (College degrees)	.027	.026†	.037*
Job grade dummy (supervisor)	-.028†	-.046***	-.044***
Job grade dummy (middle management)	.025	.000	.008
Job grade dummy (senior management)	.083***	.020	.021
Sector dummy (semi-state)	.044**	.033*	.023†
Sector dummy (private)	.045**	.021	-.022
Firm size dummy (medium)	.003	.029†	.020
Firm size dummy (large)	.011	.058***	.047**
Predictor			
Communication		.012	-.033*
Consultation		.230***	.170***
Relational Capital		.218***	.143***
Training		.029*	.027*
Mediator			
Innovation climate			.260***
Adjusted R^2	.01	.16	.21
ΔR^2		.15	.05
ΔF	6.83***	214.03***	290.69***

Note: Standardized coefficients are reported. N = 4910 (Listwise)

*** p<.001, ** p<.01, * p<.05, † p<.10. All tests were two-tailed.

7.4.2.2 Regression analysis for employee commitment (H5a – H5d)

Following the analysis of job satisfaction, regression analysis was conducted to assess the second employee outcome; employee commitment. The hierarchical linear regression results predicting employee commitment were presented in Table 7.17. Model 5.1 includes the various control variables as predictors, and Model 5.2 adds the independent variables, i.e. communication, consultation, relational capital and training. Results under Model 5.2 show that, with a wide variety of control variables held constant, communication, consultation, and relational capital, were positively associated with employee commitment (β = .046, p<.01 for communication; β = .214, p<.001 for consultation; β = .282, p<.05 for relational capital). The beta coefficient between training and employee commitment was not significant (β = .009*, n.s.*). In the third step, innovation climate was added and the results are shown under Model 5.3. It shows that innovation climate was highly associated with employee commitment (β =.405, p<.001). Therefore, hypotheses 5a to 5c, which propose there is a positive relationship between innovation strategies, i.e. communication, consultation, and relational capital with employee commitment were supported. Hypothesis 5d proposing the positive relationship between training and commitment was not supported.

With respect to the other variables shown in Model 5.1, there were some statistically significant coefficients. For example, gender (β =.074, p<.001) shows a significant and positive impact on commitment. As females are coded 1 and males 0, females are more likely to be committed to their jobs than males. In addition, the results show that employees who work in both the semi-state commercial and private sectors are less likely to be committed than those working in the public sector (β = -.037, p<.01 for semi-state commercial sector; β = -.098, p<.001 for private sector).

Table 7.17: Results of Hierarchical Linear Regression Analysis Predicting Employee Commitment (H5a – H5d)

Variables	Commitment		
	Model 5.1	Model 5.2	Model 5.3
Control			
Gender	.074***	.057***	.038**
Tenure	.015	.035*	.038**
Education dummy (PLC and Diploma)	-.009	-.005	.005
Education (College degrees)	-.053**	-.050**	-.032*
Job grade dummy (supervisor)	.016	-.003	.002
Job grade dummy (middle management)	.043**	.018	.032*
Job grade dummy (senior management)	.133***	.063***	.065***
Sector dummy (semi-state)	.016	.004	-.012
Sector dummy (private)	-.018	-.046**	-.114***
Firm size dummy (medium)	-.037**	-.009	-.023†
Firm size dummy (large)	-.098***	-.045**	-.062***
Predictor			
Communication		.046**	-.025†
Consultation		.214***	.120***
Relational Capital		.282***	.164***
Training		.009	.006
Mediator			
Innovation climate			.405***
Adjusted R^2	.03	.21	.33
ΔR^2		.19	.11
ΔF	13.10***	289.09***	833.90***

Note: Standardized coefficients are reported.. N = 4910 (Listwise)

*** p<.001, ** p<.01, * p<.05, † p<.10. All tests were two-tailed.

7.4.2.3 Regression analysis for wellbeing (H6a- H6d)

Following the analysis of job satisfaction and employee commitment, regression analysis was conducted to assess the third employee outcome measure; employee wellbeing.

The hierarchical linear regression results predicting employee wellbeing were presented in Table 7.18. Model 6.1 includes the various control variables as predictors, and Model 6.2 adds the independent variables, i.e. communication, consultation, relational capital and training. Results under Model 6.2 show that, with a wide variety of control variables held constant, consultation and relational capital were positively associated with employee wellbeing (β = .215, p<.001 for consultation; β = .182, p<.001 for relational capital). However, communication and training were found to be significantly but negatively linked to employee wellbeing (β = -.082, p<.001 for communication; β =-.023, p<.10 for training). In the third step, innovation climate was added and the results are shown under Model 6.3. It shows that innovation climate was not associated with employee wellbeing (β =-.023, *n.s.*). Therefore, hypotheses 6b to 6c which propose that there is a positive relationship between innovation strategies, i.e. consultation and relational capital with employee wellbeing were supported. Hypotheses 6a and 6d proposing the positive relationship between communication and training with wellbeing were not supported.

With respect to the other variables shown in Model 6.1, there were some statistically significant coefficients. For example, respondents who have a diploma or college degree experience lower levels of wellbeing than those who do not have any degrees (β =-.060, p<.001 for diploma holders; β =-.090, p<.001 for college degree holders). Management grades were found to have an impact on wellbeing, i.e. supervisors, middle management and senior management experience lower wellbeing levels than employees (β = -.063, p<.001 for supervisor; β = -.099, p<.001 for middle management; β = -.092, p<.001 for senior management). In addition, the results show that employees who work in both the semi-state commercial and private sectors experience lower levels of wellbeing than those working in the public sector (β = -.072, p<.01 for semi-state commercial sector; β = -.091, p<.001 for private sector).

Table 7.18: Results of Hierarchical Linear Regression Analysis Predicting Well-Being (H6a- H6d)

Variables	Wellbeing		
	Model 6.1	Model 6.2	Model 6.3
Control			
Gender	-.013	-.024*	-.023
Tenure	.020	.038†	.038**
Education dummy (PLC and Diploma)	-.060***	-.056***	-.056***
Education (College degrees)	-.090***	-.083***	-.084***
Job grade dummy (supervisor)	-.063***	-.072***	-.072***
Job grade dummy (middle management)	-.099***	-.109***	-.109***
Job grade dummy (senior management)	-.092***	-.132***	-.132***
Sector dummy (semi-state)	.016	.005	.006
Sector dummy (private)	.020	-.007	-.004
Firm size dummy (medium)	-.072***	-.038*	-.038*
Firm size dummy (large)	-.091***	-.024	-.023
Predictor			
Communication		-.082***	-.079***
Consultation		.215***	.219***
Relational Capital		.182***	.188***
Training		-.023†	-.023†
Mediator			
Innovation climate			-.020
Adjusted R^2	.04	.14	.14
ΔR^2		.10	.00
ΔF	17.82***	144.59***	1.51

Note: Standardized coefficients are reported. N = 4910 (Listwise)

*** p<.001, ** *p*<.01, * *p*<.05, † *p*<.10. All tests were two-tailed.

7.4.3 Regression Analysis for Mediating Role of Innovation Climate (Hypotheses 7- 12)

The next step in the investigation of the research model, following the Baron and Kenny (1986) structure, was to test the role of innovation climate as a mediator in the relationship between organisational innovation strategies and innovation outcomes. Hypotheses 7 to 12 propose that innovation climate acts as a mediator in the relationship between innovation strategies (communication, consultation, relational capital and training) and both organisational innovation outcomes (new service, new products, and workplace innovation) and employee outcomes (job satisfaction, commitment, and wellbeing). The mediation test followed the four conditions described by Baron and Kenny (1986). These are: (1) that the independent variable is directly related to the dependent variable (X->Y); (2) that the independent variable should be related to the mediator (X->M); (3) that the mediator should be related to the dependent variable (M->Y); and (4) that the direct relationship between the independent and dependent variables should become non-significant (full mediation) or weaker (partial mediation) when accounting for the effect of the mediator (X+M->Y).

To streamline the presentation and to avoid repetition in the reporting of the results, one detailed example of the findings for the meditational model which proposed the mediating effect of innovation climate in the relationship between one innovation strategy, i.e. communication and one organisation innovation outcome, i.e. new services was presented (H7a). Then the results for the additional mediation models are reported in a short section and presented in Table 19. Then Table 7.20 presents a summary of the results for each step and Sobel Test for all mediation models.

The first condition (X->Y) requires that communication is significantly linked to the introduction of new services, which was satisfied by the support for hypothesis 1a where communication was found to be significantly and positively associated with the introduction of new services. Regarding the second condition (X->M), regression results in Table 7.19 show that communication is positively associated with innovation climate (β = .174, p<.001), satisfying the second condition. For the third condition (M->Y), support was found for the positive and significant relationship between innovation climate and the introduction of new services under Model 1.3 in Table 7.13 (B = .768, p <.001). In relation to the fourth condition (X+M->Y), after adding innovation climate into the regression, results

under Model 1.3 in Table 7.13 show that the coefficient for communication has been reduced but stays significant (B = .641, p <.001 to B = .557, p <.001). Therefore, the 4th condition was satisfied. The Sobel test was used to access the reliability of the mediation model (Sobel, 1982). The result shows support for the mediation model of communication-innovation climate-new services, (Z = 9.802, p<.001). Therefore, hypothesis 7a was supported.

Using the same method, innovation climate was found to mediate the relationship between consultation (Z = 11.400, p<.001) and relational capital (Z = 12.810, p<.001) and the introduction of new services; between communication (Z = 9.890, p<.001), consultation (Z= 11.337, p<.001), and relational capital (Z = 12.580, p<.001) and new products; between communication (Z = 12.867, p<.001), consultation (Z = 13.918, p<.001), and relational capital (Z = 15.605, p<.001) and workplace innovation; between consultation (Z = 17.452, p<.001), and relational capital (Z = 17.817, p<.001) and employee job satisfaction; between communication (Z = 17.644, p<.001), consultation (Z = 23.185, p<.001), and relational capital (Z = 23.158, p<.001) and employee commitment. Therefore, hypotheses 7b, 7c, 8a to 8c, 9a to 9c, 10b, 10c, 11a to 11c were supported.

Table 7.19: Results of Hierarchical Linear Regression Analysis Predicting Innovation Climate (H7-12)

Variables	Innovation Climate	
	Model 7.1	Model 7.2
Control		
Gender	.064***	.047***
Tenure	-.020	-.005
Education dummy (PLC and Diploma)	-.025	-.023†
Education (College degrees)	-.042	-.044**
Job grade dummy (supervisor)	.016	-.011
Job grade dummy (middle management)	.008	-.032*
Job grade dummy (senior management)	.088***	-.004
Sector dummy (semi-state)	.049***	.038**
Sector dummy (private)	.195***	.169***
Firm size dummy (medium)	.017	.034*
Firm size dummy (large)	.015	.043**
Predictor		
Communication		.174***
Consultation		.231***
Relational Capital		.291***
Training		.009
Adjusted R^2	.04	.30
Δ R^2		.26
ΔF	20.92***	455.45***

Note: Standardized coefficients are reported. N = 4910 (Listwise)

*** p<.001, ** *p*<.01, * *p*<.05, † *p*<.10. All tests were two-tailed.

These findings demonstrate that innovation climate is an important mediator in the relationship between the organisational innovation strategies, communication, consultation and relational capital and innovation outcomes as supported by the literature (Ekvall, 1996; West and Richter, 2007; Takeuchi et al., Mossholder et al., 2011). However, the disconfirming findings concerning training will discussed in the following chapter. The final hypotheses explored the linkage between employee outcomes and organisational outcomes.

Table 7.20: A Summary of Results for each Step and Sobel Test of Mediation Model

Hypothesis	**X** Innovation strategies	**M** Innovation climate	**Y** Outcomes	**1st condition** (X->Y)	**2nd condition** (X->M)	**3rd condition** (M->Y)	**4th condition** (XM->Y)	**Sobel Test** (Z)
7. Innovation climate mediates the relationships between innovation strategies and new services.	Communication	Innovation climate	New service	√	√	√	√[a]	9.802***
	Consultation			√	√	√	√	11.400***
	Relational Capital			√	√	√	√	12.810***
	Training			√	×	√	--	--
8. Innovation climate mediates the relationships between innovation strategies and new products.	Communication	Innovation climate	New products	√	√	√	√[a]	9.890***
	Consultation			√	√	√	√	11.337***
	Relational Capital			√	√	√	√	12.580***
	Training			√	×	√	--	--
9. Innovation climate mediates the relationships between innovation strategies and new workplace innovation.	Communication	Innovation climate	New process/ideas	√	√	√	√[a]	12.867***
	Consultation			√	√	√	√[a]	13.918***
	Relational Capital			√	√	√	√[a]	15.605***
	Training			√	×	√	--	--
10. Innovation climate mediates the relationships between innovation strategies and job satisfaction.	Communication	Innovation climate	Job Satisfaction	×	√	√	--	--
	Consultation			√	√	√	√[a]	17.452***
	Relational Capital			√	√	√	√[a]	17.817***
	Training			√	×	√	--	--
11. Innovation climate mediates the relationships between innovation strategies and job satisfaction.	Communication	Innovation climate	Commitment	√	√	√	√[a]	17.644***
	Consultation			√	√	√	√[a]	23.185***
	Relational Capital			√	√	√	√[a]	23.158***
	Training			×	×	√	--	--
12. Innovation climate mediates the relationships between innovation strategies and wellbeing.	Communication	Innovation climate	Wellbeing	√	√	×	--	--
	Consultation			√	√	×	--	--
	Relational Capital			√	√	×	--	--
	Training			√	×	×	--	--

Note: [a] indicates that the direct path between X and Y remained significant. *** p< .001, ** p<.01, * p<.05, † p<.10. All tests were two-tailed.

7.4.4 Regression Analysis Linking Employee Experiences with Organisational Innovation Outcomes (Hypotheses 13-15)

In the final step in the investigation of the model, regression analysis was undertaken to test the relationship between employee outcomes and organisational innovation outcomes. Hypotheses 13 to 15 proposed that employee outcomes (job satisfaction, commitment, and wellbeing) are positively associated with organisation innovation outcomes (service, product and workplace innovation). As organisational innovation outcomes were assessed by three binary variables, the binary regression analysis method was employed to test the above hypotheses. The results shown in Table 7.21 show that job satisfaction was positively associated with new services (*B* = .154, *p*<.05) and workplace innovations (*B* = .199, *p*<.01) but had no impact on new products (*B* = 060, *n.s.*); commitment was positively associated with all three innovation outcomes, i.e. new services (*B* = .543, *p*<.001), new products (*B* = .488, *p*<.001) and workplace innovation (*B* = .828, *p*<.001). However, wellbeing was found to be negatively associated with new services (*B* = -.080, *p*<.05) and workplace innovation (*B* = -.076, *p*<.05) but had no impact on new products (*B* = -.044, *n.s.*). Therefore, hypotheses 13a, 13b, 14b, 15a and 15b were supported.

Table 7.21: Results of Binary Logistic Regression Analysis Predicting Organisational Innovation (H13-H15)

Outcomes by employee experiences

Variables	New Services	New Products	Workplace innovation
	Model 10.1	Model 10.2	Model 10.3
Intercept/constant	-2.050*** (.247)	-2.324*** (.327)	-3.340*** (.293)
Control			
Gender	.059 (.063)	-.151* (.071)	.035 (.064)
Tenure	-.002 (.003)	-.006†(.004)	-.010** (.003)
Education dummy (PLC and Diploma)	.058 (.080)	.117 (.091)	.091 (.082)
Education (College degrees)	.097 (.073)	.027 (.083)	.093 (.074)
Job grade dummy (supervisor)	.190* (.097)	.244* (.111)	.280** (.099)
Job grade dummy (middle management)	.338*** (.088)	.147 (.101)	.253** (.089)
Job grade dummy (senior management)	.262* (.115)	.348** (.134)	.402*** (.121)
Sector dummy (semi-state)	.333* (.144)	.542*** (.160)	.191 (.144)
Sector dummy (private)	-.101 (.068)	.872*** (.080)	.099 (.069)
Firm size dummy (medium)	.268*** (.074)	.237** (.084)	.379*** (.075)
Firm size dummy (large)	.581*** (.075)	.663*** (.086)	.596*** (.076)
Predictor			
Job satisfaction	.154* (.074)	.060 (.084)	.199** (.074)
Commitment	.543*** (.078)	.488*** (.090)	.828*** (.081)
Wellbeing	-.080* (.036)	-.044 (.040)	-.076* (.036)
Likelihood-ratio χ^2	207.94***	271.07***	299.55***
Log-likelihood	6384.93	4970.26	6268.08
Pseudo R^2	.06	.09	.08
$\Delta\ \chi^2$	96.74***	46.00***	194.50***
N (Listwise)	4776	3829	4839

Note: Unstandardized coefficients are reported. Standardized errors are in parentheses.

*** p<.001, ** p<.01, * p<.05, † p<.10. All tests were two-tailed.

7.5 Summary

This chapter outlined the analysis of the survey responses based on the research model illustrated in Figure 7.1 and the hypotheses outlined in Table 7.10. The results of binary and hierarchical linear regression analysis were presented. It is clear from this analysis that most of the hypotheses as derived from the literature and detailed in the methodology chapter were supported. In particular the analysis showed that innovation climate was highly associated with organisational innovation outcomes, the introduction of new services and new products and new workplace innovations. Innovation climate was also highly associated with employee job satisfaction and commitment. The results show support for the mediation model of organisational strategies, innovation climate, and organisational innovation outcomes. Innovation climate was found to mediate the relationships between communication, consultation and relational capital and the introduction of new services, new products and new workplace innovations. The results also show support for the mediation model of organisational strategies, innovation climate, and employee outcomes; between consultation relational capital and employee job satisfaction; between communication, consultation and relational capital and employee commitment.

The findings show a positive relationship between organisational innovation strategies and organisational innovation outcomes. There is a positive relationship between communication, consultation, relational capital and training and the introduction of new services, new products and new workplace innovation. There is also a positive relationship between organisational innovation strategies and employee outcomes. The analysis found a positive relationship between consultation, relational capital and employee outcomes, job satisfaction, employee commitment and wellbeing. However, a positive relationship between communication and job satisfaction was not supported. Also a positive relationship between training and commitment was not supported and positive relationships between communication and training and wellbeing were not supported.

The results show that job satisfaction was positively associated with the introduction of new services and workplace innovations but had no impact on new products. Commitment was positively associated with new products and workplace innovations. However, wellbeing was found to be negatively associated with new services and workplace innovations but had no impact on new products. A full table summary of the findings is outlined at the beginning of the next chapter where the implications of these findings will be discussed.

Chapter Eight: Discussion: Innovation Strategies, Climate and Outcomes

8.1 Introduction

This chapter brings together the empirical evidence from the investigation and reviews its relevance in the context of previous studies and established theory particularly that discussed in the literature review on organisational innovation and innovation climate. A summary of the key findings presented in Chapter 7 is outlined in Table 8.1**.** Overall the main objective of the current research was to better understand the dynamics of innovation in organisations through an analysis of employees' perceptions of the innovation environment in which they are working and an analysis of their views and dispositions towards the support they receive in their innovation endeavours. The overarching aim of the analysis is to assess how organisational innovation strategies and innovation climate can assist in effecting change and innovation behaviours in employees, thereby positively affecting innovation outcomes. From this assessment, insights into the development of the microfoundations of dynamic capability for innovation can be suggested (Teece, 2007; Felin and Foss, 2005, 2009; Abell et al., 2008; Felin et al., forthcoming).

This chapter will analyse the significance of the findings and how they relate to the literature from the following perspectives. Firstly, the significance of the support for the research model in understanding and developing internal organisational innovation capacity will be discussed. This will include consideration of the implications of findings which show a strong association between organisational innovation strategies and innovation outcomes; the centrality of innovation climate in understanding and developing innovation capability; and the positive relationships between employee outcomes and organisational outcomes in respect of innovation.

Secondly, the chapter will explore some of the more unexpected results. In particular, the findings illuminate the complexity of causality indicating that positive supportive strategies may not always result in mutual gains for all concerned (Geary and Trif, 2011; Ehrnrooth and Bjorkman, 2012). The unexpected lack of support for wellbeing in the model under investigation and the weak correlations in relation to wellbeing measures in general in this

study, will be reviewed in this context. Equally the significance of some of the weak findings in relation to training require careful interpretation in light of the centrality of learning and knowledge in all the literatures reviewed as part of this study; dynamic capabilities literature (Lundvall, 1998, 2007; Zollo and Winter, 2002; Eisenhardt and Martin, 2000; Ambrosini and Bowman, 2009), organisational innovation literature (Read, 2000; Shipton et al., 2006; Lynch, 2007) and innovation climate literature (Anderson and West, 1998; Hunter et al., 2007).

Finally, in more general terms, the chapter will review the significance of support for the model in understanding the link between strategies and outcomes and explaining the 'black box' in HR (Guest, 2001; Boselie et al., 2005; Harney, 2009). Despite many years of empirical findings and conceptual development concerning the mechanisms relating HR strategies to performance, the '*HR – performance link still retains many of its secrets'* (Ehrnrooth and Bjorkman, 2012, p. 19). Recently, Guest ruefully acknowledges that after all this time, we are '*more knowledgeable but not much wiser'* (2011, p. 3). This research, because it is based on responses from a large survey of employees, is particularly strongly placed to provide unique insights into understanding the causal link between strategies and outcomes, most notably, innovation outcomes. Overall, it is proposed the findings have significance for understanding and developing the microfoundations of dynamic capabilities (Teece et al., 2007; Abell, et al., 2008). This is documented further in the next chapter.

The results of the analysis are summarised in table 8.1 below

Table 8.1: Summary of Findings Supporting Hypotheses

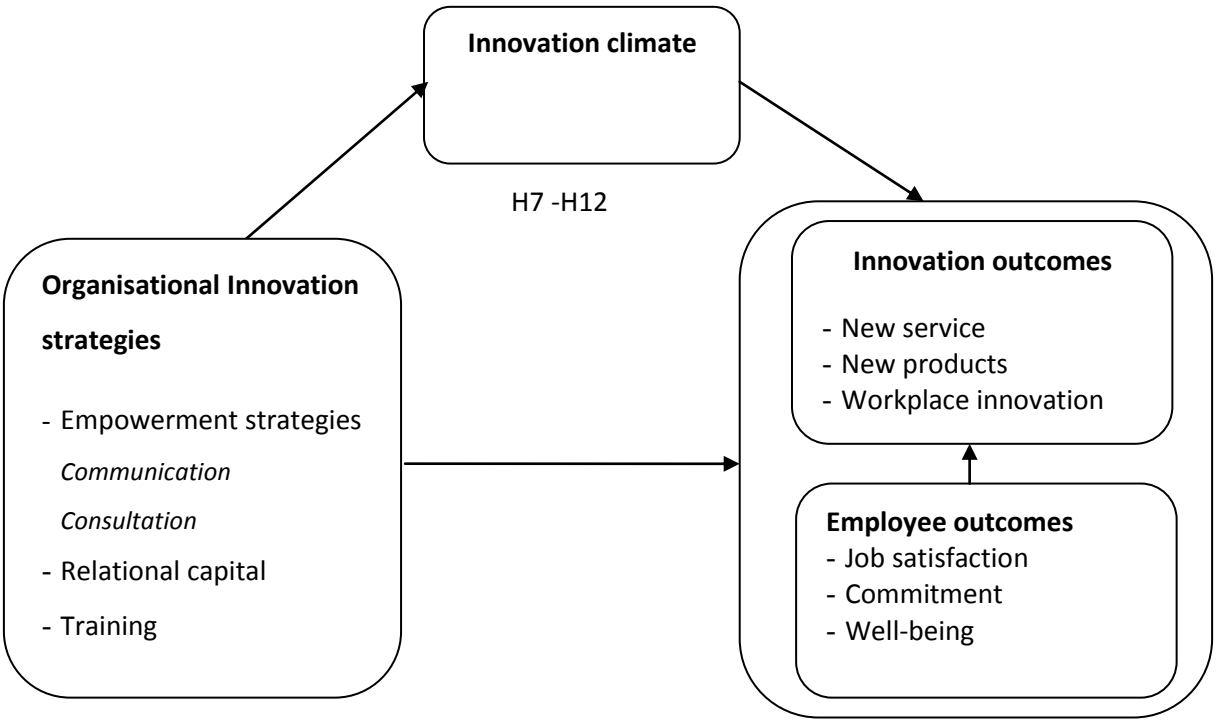
Hypotheses	X Strategies	M Climate	Y Outcomes	Results
Organisational Innovation Strategies and Innovation Outcomes : 1-6				
1. Organisational innovation strategies are positively associated with the introduction of new services.	Communication (1a)	n/a	New services	√
	Consultation (1b)			√
	Relational Capital (1c)			√
	Training (1d)			√
2. Organisational innovation strategies are positively associated with the introduction of new products.	Communication (2a)	n/a	New products	√
	Consultation (2b)			√
	Relational Capital (2c)			√
	Training (2d)			√
3. Organisational innovation strategies are positively associated with the introduction of new workplace innovations.	Communication (3a)	n/a	New workplace innovations	√
	Consultation (3b)			√
	Relational Capital (3c)			√
	Training (3d)			√
4. Organisational innovation strategies are positively associated with employee job satisfaction.	Communication (4a)	n/a	Job satisfaction	×
	Consultation (4b)			√
	Relational Capital (4c)			√
	Training (4d)			√
5. Organisational innovation strategies are positively associated with employee commitment.	Communication (a)	n/a	Commitment	√
	Consultation (b)			√
	Relational Capital (c)			√
	Training (d)			×
6. Organisational innovation strategies are positively associated with employee wellbeing.	Communication (6a)	n/a	Wellbeing	×
	Consultation (6b)			√
	Relational Capital (6c)			√
	Training (6d)			×
Innovation Climate as a Mediator between Strategies and Outcomes: Hypotheses 7-12				
7. Innovation climate mediates the relationship between organisational innovation strategies and the introduction of new services.	Communication (7a)	Innovation climate	New services	√
	Consultation (7b)			√
	Relational Capital (7c)			√
8. Innovation climate mediates the relationships between organisational innovation strategies and the introduction of new products.	Communication (8a)	Innovation climate	New products	√
	Consultation (8b)			√
	Relational Capital (8c)			√
	Training (8d)			×

9. Innovation climate mediates the relationship between organisational innovation strategies and the introduction of new workplace innovations.	Communication (9a)	Innovation climate	New workplace innovations	√
	Consultation (9b)			√
	Relational Capital (9c)			√
	Training (9d)			×
10. Innovation climate mediates the relationship between organisational innovation strategies and job satisfaction.	Communication (10a)	Innovation climate	Job Satisfaction	×
	Consultation (10b)			√
	Relational Capital (10c)			√
	Training (10d)			×
11. Innovation climate mediates the relationship between organisational innovation strategies and employee commitment.	Communication (11a)	Innovation climate	commitment	√
	Consultation (11b)			√
	Relational Capital (11c)			√
	Training (11d)			×
12. Innovation climate mediates the relationship between organisational innovation strategies and wellbeing.	Communication (12a)	Innovation climate	Wellbeing	×
	Consultation (12b)			×
	Relational Capital (12c)			×
	Training (12d)			×
Employee outcomes and Organisational innovation outcomes: Hypotheses 13-15				
13. Employee outcomes are positively associated with the introduction of new services.	Job satisfaction (13a)	n/a	New services	√
	Commitment (13b)			√
	Wellbeing (13c)			×
14. Employee outcomes are positively associated with the introduction of new products.	Job satisfaction (14a)	n/a	New products	×
	Commitment (14b)			√
	Wellbeing (14c)			×
15. Employee outcomes are positively associated with the introduction of new workplace innovations.	Job satisfaction (15a)	n/a	New workplace innovations	√
	Commitment (15b)			√
	Wellbeing (15c)			×

8.2 Significance of Support for the Model in Understanding Organisational Innovation

This section will analyse the significance of support for the research model in understanding and developing internal organisational-level innovation capability. In following the sequence of the research model as outlined in Figure 8.1, the discussion begins by considering the significance of the strong association between organisational innovation strategies and innovation outcomes and the weak relationships in respect of training. This will be followed in the next section by considering the centrality of innovation climate in understanding and developing innovation capability, and the relationships between employee outcomes and organisational outcomes.

Figure 8.1: Theoretical Model with Proposed Hypotheses



8.2.1 Organisational Innovation Strategies and Innovation Outcomes

In this study, organisational innovation strategies can be viewed as representing the broad guiding principles or the '*architectural rubric*' (Becker and Gerhart, 1996, p. 786) of the organisation's approach to developing innovation capability. In further understanding the dynamics of innovation in organisations, and seeking to develop capability for innovation, the findings from this research provide important evidence of the significant relationships between organisational innovation strategies and innovation outcomes. The analysis shows strong links between empowerment enhancing strategies (communication and consultation), relational capital, training and innovation outcomes and a weaker link between training and employee outcomes. These findings provide positive support for previous studies which link empowerment-enhancing strategies with improved organisational innovation outcomes (Spreitzer, 1995; Conway and McMackin, 1997; Read, 2000; Black and Lynch, 2004; Lynch, 2007; McLeod and Clarke, 2009; Subramony, 2009). They also support studies which demonstrate that positive relationships and support from management are important strategies in supporting innovation (Hage, 1999; Conway and McMackin, 1997; Damampour, 1991; Skarzynski and Gibson, 2008; McLeod and Clarke, 2009). The link between workforce training and improved organisational innovation outcomes, product innovation, service innovation and workplace innovation is also strong, supporting studies which have previously shown a strong association between training/learning and innovation outcomes (Leavy and Jacobson 1997; Hage, 1999; Lundvall, 1998, 2007; Appelbaum, 2000; Read, 2000; Lam, 2005; Shipton et al., 2006; Lynch, 2007). However, while the association between training and job satisfaction is supported, the associations between training and commitment and wellbeing are not supported.

The findings in relation to empowerment-enhancing strategies, communication and meaningful consultation align with Spreiter's studies (1997) on psychological empowerment which he found is related to creativity. Spreitzer conceptualises empowerment as constituting four dimensions of employees' perceptions of their interaction with work, ability, autonomy, impact and significance, the first reflecting ability and the latter three reflecting opportunity which is afforded by empowerment strategies. Empowerment also reflects motivation and the feelings of being able, motivated and confident in undertaking challenges and projects, characteristics that are supported by good relationships and positive support from managers which in this research are positively related to innovation performance. Of the organisational innovation strategies analysed, in

this study, communication showed the strongest association with organisational innovation outcomes; service innovation, product innovation and workplace innovation. The association was strongest between communications and workplace innovation. This would suggest that strong and frequent communication is an important consideration in supporting innovation in the workplace and the introduction of new services and products and new workplace innovations.

These findings also support the theory that social relationships are an important part of the innovation process as they provide individuals with the social environment and motivation to create, retain and transfer knowledge (Argote et. al., 2003). They also align with the AMO (Abilities, Motivation and Opportunities) theory developed by Boxall and Purcell (2003) which shows that particular strategies and practices can influence employee performance through three interrelated pathways; by developing employee abilities and skills, in this case offering training opportunities; by increasing motivation through good relationships and empowerment strategies; and by providing employees with the opportunities through empowerment-enhancing strategies, to use their knowledge and skills (Boxall and Purcell 2003; Macky and Boxall, 2007).

8.2.2 Training Opportunities: Some Weak Links

While the link between workforce training and improved organisational innovation outcomes is strongly supported, the relationships between training and employee outcomes, commitment and wellbeing were not supported. Furthermore, innovation climate was not supported as a mediator in the relationship between training and innovation outcomes; either organisational innovation outcomes or proximal employee outcomes. Because of the importance of learning, knowledge acquisition and knowledge growth in the literature on dynamic capabilities for innovation (Lundvall, 1998, 2007; Zollo and Winter, 2002), in the organisational innovation literature (Hage, 1999; Read, 2000; Shipton et al., 2006; Lam, 2007) and in the innovation climate literature (Anderson and West, 1998; Hunter, 2007) these findings relating to training opportunities warrant consideration. The literature reviewed suggest that innovation requires a combination of the more formal aspects of knowledge development such as training and codified knowledge creation, and the less formal social perspective on learning and knowledge management (Lundvall et al., 2007; Nonaka, 1994).

The findings in this research relating to training opportunities therefore require careful and nuanced interpretation. The lack of support for a link between training and commitment and the lack of support for innovation climate as a mediator of the relationship between training and organisational innovation outcomes and employee outcomes suggest that *formal* training is not an important dimension in developing innovation climate. Training is, however, an important strategy in supporting innovation outcomes but it does not seem to register with employees in relation to their commitment, wellbeing or innovation behaviours and their perceptions of a climate of innovation. However, because of the strength of the findings in relation to positive relationships and employee outcomes and innovation climate, it is likely that more *informal learning* and tacit knowledge and knowledge sharing are the predominant learning and knowledge generating modes in dynamic innovation contexts. This would align with theories of knowledge which highlight the tacit dimension or tacit knowing, (Polanyi, 1966, 1983), the role of employees as '*knowers*' (Wenger, 2001. p. 68) and learning by doing or doing, using and interacting modes of learning (Lundvall et al., 2007).

It may be that in innovative organisations characterised by on-going and continuous learning, engagement with more formal training is of lesser significance or simply that learning and training opportunities are provided in such a way that they are not perceived by employees as formal. Because learning and knowledge development are integral parts of the organisational innovation dynamic, the distinction between formal and informal learning is blurred. In these organisations, learning is a seamless process and social relationships become the most important part of the knowledge development and innovation process. It is these interactions which contribute to the amplification and the development of new knowledge (Nonaka, 1994) and in these respects the firm can be viewed as a repository of social knowledge (Kogut and Zander, 1995). It would seem therefore that opportunities for training remain an important strategy in generating organisational innovation outcomes, but that formal training seems to have little impact on the culture and climate of the organisation or on employees' perceptions and feelings and little impact on their perceived commitment or wellbeing.

8.3 The Centrality of Innovation Climate in Understanding and Developing Innovation Capability

The findings from this study demonstrate that innovation climate is a critically important element in organisational-level innovation and a key consideration in the development of dynamic capability for innovation and its underpinning microfoundations. The analysis demonstrates that innovation climate acts as a mediator in the relationship between the organisational innovation strategies of consultation, communication, the development of good relationships and innovation outcomes. However, the mediating role of innovation climate in the relationship between training and innovation outcomes is not supported. These findings however, strongly support the role of climate as a powerful mechanism through which HR systems influence employee perceptions, behaviours and values and are therefore an important element in understanding the impact of organisational innovation strategies (Rousseau, 1995; Takeuchi et al., 2009; Heffernan et al., 2009; Mossholder et al., 2011) and approaches to building capability.

8.3.1 The Strong Link between Organisational Innovation Strategies and Innovation Climate

The strong link between organisational strategies associated with innovation such as communications, consultation, relationship capital and innovation climate can be explained as follows. These strong links are reflecting the presence and effectiveness of particular HR strategies on employees; in this case frequent communications, consultation, and good relationships. While HR strategies are regarded as strategies designed or intended to influence employee beliefs and behaviours (Anderson and West, 1998; Wright and Nishi, 2006; Purcell and Hutchinson, 2007), innovation climate, by measuring employees perceptions and beliefs, can be said to measure how these strategies are perceived, received and experienced by employees. This strong link between strategies and climate can therefore be measuring a dual impact; the effectiveness of *the implementation* of particular organisational innovation strategies and *employees' perceptions* of strategies; perceptions such as their relevance to them personally, their meaning, validity and consistency and the degree to which strategies are advantageous to them and confer benefits (Ehrnrooth and Bjorkman, 2012). The effectiveness of the implementation of strategies is related to the effectiveness of communication of such strategies and the role of line managers in implementing corporate strategies (Purcell and Hutchinson, 2007). In this regard, it can be argued that the link between organisational innovation strategies and

innovation climate is evidence of the strength of the HR process and its strong signalling effects (Bowen and Ostroff, 2004). These authors view the implementation of HR strategies as a means of communicating strong messages or signals to employees and providing clarity about desired behaviours and behaviours which will be celebrated and rewarded. The strong link between strategies and innovation climate in this study is reflecting the presence of an innovation dynamic where there is a synergy between different strategies and inputs designed as part of a system or architecture (Becker and Gerhart, 1996) for innovation and employee perceptions and awareness of such inputs. This evidence supports those who suggest that in understanding effectiveness and causality, it is sensible to seek information from those experiencing particular practices i.e. workers, rather than those who design them (e.g. Bowen and Ostroff, 2004).

The significant positive relationship between levels of consultation and innovation climate indicates that more meaningful consultation is associated with a stronger innovation climate. Such strategies increase helping and supporting behaviours amongst colleagues and increase collaboration and knowledge sharing which is necessary for creativity and innovation to occur (Neal et al., 2005; Chadwick and Dabu, 2009). Equally, the strong link between good relationships and innovation climate, the second strongest correlation in the binary analysis (see Table 7.7 and 7.8) supports the overwhelming evidence that positive affective tone and encouragement from managers are very important elements of innovation climate (James and James, 1989; Amabile, 1993; Anderson and West, 1998; Ekvall and Ryhammer, 1999; Shipton et al., 2006; Patterson et al., 2005; Hunter et al., 2007). It also supports the many studies which demonstrate that creativity and innovation depend on positive support from colleagues (James and James, 1989; Ekvall and Ryhammer 1999). Good relationships with colleagues are key dimensions of innovation climate as group work co-operation, trust and openness, participative safety, positive feelings and job satisfaction feature strongly in the innovation climate literature and in taxonomies of dimensions of innovation climate (Campbell et al., 1970; Amabile, 1993; Anderson and West, 1998; Patterson et al., 2005; Shipton et al., 2006; Hunter et al., 2007). Good relationships with colleagues are also likely to enable good co-operation as well as more favourable responses from them thus increasing the potential for the generation of new knowledge and ideas and beneficial social interaction which is important at each stage of the innovation process (Shipton et al., 2006). Good relationships with colleagues support a climate of innovation as they allow for greater reflexivity (West et al., 2004) which allows

for team members to not only reflect on their work collectively but also to make changes and adjustments accordingly. Positive relationships also create greater levels of energy and vigour in organisations (Spreitzer and Sutcliffe, 2007). Vigour and dynamism are very closely linked and this allows for greater adjustment to rapid change (Bruch and Ghoshal, 2003; Cross et al., 2003). This is important in linking innovation climate to dynamic capability because if positive relationships and a positive work environment increase vigour and adaptation to change then they provide important insights into building dynamic capability.

8.3.2 Innovation Climate and Organisational Innovation Outcomes

The analysis showed that innovation climate is strongly correlated with organisational innovation outcomes; new services, new products and new workplace innovations. The relationship between innovation climate and workplace innovation, which involves the introduction of innovations in the workplace such as new ideas, processes or behaviours that led to significant improvements in the way work is carried out, is particularly strong. The link between innovation climate and workplace innovation is significant as workplace innovation requires changing practices and routines in order to bring about improvements in the way work is carried out. It therefore reflects elements of innovation capability in action. It is difficult to manage and sustain creativity as it requires a shift in attitudes and movement away from what is familiar to that which is unknown (Ford, 1996; Ekvall, 1997; Cavagnou, 2011). As workplace innovation involves the introduction of innovations in the workplace such as new ideas, processes or behaviours that lead to significant improvements in the way work is carried out, it demonstrates the ability to change habitual routines and behaviours and therefore reflects the presence of dynamic capability for change and innovation. The strong association between innovation climate and workplace innovation therefore provides some of the answers to the challenges of disturbing habitual behaviours in favour of more creative actions and routines and therefore to the challenge of developing and embedding the microfoundations of dynamic capability for innovation in the organisation.

8.3.3 Innovation Climate and Employee Innovation Outcomes

The analysis indicates that there is a very strong link between innovation climate and employee outcomes particularly commitment and job satisfaction. The strength of the correlation between innovation climate and commitment is explained by the fact that organisational climate is thought to enhance motivation and increase the likelihood that employees will give 'discretionary effort' to their work (Brown and Leigh, 1996; Neal and Griffin, 1999) and will also be more willing to collaborate with and assist and support their colleagues (Chadwick and Dabu, 2009). Similarly, innovation climate acts as an important mediator between organisational practices and employee attitudes leading to increased job satisfaction and affective commitment (Takeuchi et al., 2009). The strong association with commitment will also have significant implications in understanding how to affect change in employee behaviours and in developing approaches to building capability for innovation

High levels of involvement and commitment are particularly important in the process of creativity and innovation (Csikszentmihalyi, 1990; Amabile, 1993). The strong correlation between innovation climate and job commitment supports Csikszentmihalyi's (1990) work on problem solving in which he suggests that finding solutions to difficult and intractable problems requires high levels of commitment in the form of interest, curiosity and application; a state he called *'flow'* which is a highly motivated and excited state which leads to creativity and discovery. Thus the high correlation between innovation climate and commitment in this study adds further evidence to support the view that high levels of effort and commitment are required for innovation to occur and one of the effects of innovation climate is that it leads to high levels of commitment and engagement of employees (Blau, 1964; Takeuchi et al., 2009; Cavagnou, 2011).

The strong correlation between innovation climate and commitment and job satisfaction indicates that a strong underlying dynamic is at work in these organisations. Innovation climate is an important mediator in the relationship between organisational innovation strategies and innovation outcomes *because* it increases job satisfaction and thus increases job commitment and effort towards performance and innovation outcomes.

8.4 Contradictory Findings Relating to Wellbeing

The findings showing a very weak link between innovation climate and wellbeing are surprising. The preponderance of studies on creativity and innovation demonstrate that positive relationships and a positive organisational climate are of critical importance to creativity and innovation (Campbell et al., 1970; James and James, 1989; Amabile, 1993; Anderson and West, 1998; Ekvall and Ryhammer 1999; Patterson et al., 2005; Shipton et al., 2006; Hunter et al., 2007). It would therefore be expected that wellbeing would be improved and that stress at work would be reduced by positive innovation climate. For example as discussed in Chapter 5, Lansisalmi and Kivimaki (1999) found that high stress was associated with poor innovative climate and stress seemed to influence innovation climate independently of other determinants of innovation (Lansisalmi and Kivimaki., 1999). Job demands and job stress have been shown to relate to exhaustion, decreased learning, and low job satisfaction (King et al., 2007). Similarly for levels of work pressure, because creativity often involves the subconscious mind as well as the conscious (Claxton, 1998), time for reflection is a necessary precondition and therefore work pressure and stress could hamper these processes. An organisational climate that is less threatening and stressful is conducive to promoting creative behaviour while a climate where there is fear of failure and suspicion would hold back creative endeavours (Ekvall, 1997). There is also evidence to suggest that the creation and maintenance of innovative organisational climates may be an appropriate way to address the concerns associated with demanding work leading to stress and that innovation climate can effectively counter the negative effects and levels of stress associated with work pressure (King et al., 2007).

The findings from this investigation contradict these studies. The lack of support for wellbeing outcomes is particularly surprising in the context of this study which has examined a number of measures relating to employee outcomes. For example the study has shown that innovation climate mediates the relationship between the organisational innovation strategies of consultation and relational capital and the employee outcomes of job satisfaction and commitment. In this study however, there is no support for innovation climate as a mediator in the relationship between any of the organisational innovation strategies tested and wellbeing outcomes. On the contrary these findings support the view that there is also good stress and pressure at work, which Selye called *eustress* (1976a, 1976b), and that there is a fine line between stress and challenge at work (Simmons and Nelson, 2007; Cavagnou, 2011). A positive response to stress occurs if the outcomes are

perceived as positive and if it is expected that the source of stress will result in enhancing the wellbeing of the individual. These findings support the view that the borders between pressure and stress and challenge may be rather narrow and support the evidence from some studies that work pressure and challenges are positively related to innovation (Anderson and West, 1998). The explanation for this is that some employees produce their most productive and creative work when they work on complex challenging jobs (Oldham and Cummings, 1996). Challenge and intellectual stimulation are deemed to be one of the most important dimensions of innovation climate together with strong relationships and positive collegial exchange (Hunter et al., 2007). Acceptable levels of work pressure and stress can be understood as an integral part of this dynamic.

The findings also align with recent studies which suggest that progressive HRM can result in increased work intensity and increased workload (Ehrnrooth and Bjorkman, 2012). The very same mechanisms that support innovation performance are also related to increased workload. Reflecting the dimensions of increased work challenge and stimulation, the logic of this theory is that as employees feel more able, motivated and supported to be creative and give discretionary effort and investment to their innovation efforts, their work intensifies and their workload increases. Moreover as strong 'signalling' messages about expectations and performance are recieved by employees from effective organisational innovation strategies and strong innovation climate, employees will respond accordingly and will increase their efforts in line with expectations (Spreitzer, 1997; Ehrnrooth and Bjorkman, 2012). The result is increased work pressure and stress, albeit that it may be stress that is self-induced and strongly related to ambition, challenge and stimulation.

The unexpected lack of support for wellbeing in the model under investigation and the weak correlations in relation to wellbeing measures in general in this study, provide evidence of the unpredictable nature of causality and indicate that positive supportive strategies may not always result in a win-win for all concerned (Geary and Trif, 2011; Ehrnrooth and Bjorkman, 2012). It attests to a complex relationship between organisational innovation strategies, innovation climate and outcomes such as as workload, stress and pressure. It is possible for example that those gains in innovation performance may be achieved at the expense of workers where increased workload results in increased work intensification, exhaustion and work/family conflict (Guest, 2011). Equally, because of the strong findings in relation to good relationships and innovation climate and the strong

element of empowerment in the model, the negative findings in respect of pressure and stress may represent more positive forces at work between workload and psychological benefits relating to achievement and creativity. For example, empowerment is known to offset the negative relationship between work pressure and stress (Spreitzer, 1997). In this regard it is likely the findings in relation to stress and pressure in this study are that of 'good stress' reflecting increased challenge and workload which is self- generated and self-motivated by complex challenging work relating to creativity and innovation (Oldham and Cummings, 1996). Similarly job challenge and direct action can stimulate learning and growth and while increasing productivity may not necessarily lead to increased stress (Karasek, 1979; Karasek and Tores, 1998). Nonetheless it is important to note this evidence of the complexity and unpredictability of the links between strategies and outcomes, outcomes which are not always linear and beneficial for all concerned, and to leave open the possibility that there are positive and negative mediating relationships between organisational innovation strategies and innovation performance outcomes (Geary and Trif, 2011).

8.5 Link between Employee Outcomes and Organisational Innovation Outcomes

In addition, this study has shown that employee outcomes such as increased commitment and increased job satisfaction are linked to organisational innovation outcomes; service innovation, product innovation and workplace innovation. The relationship between commitment and innovation outcomes supports the findings from studies that suggest that innovation requires strong interest, motivation and commitment (Csikszentmihalyi, 1990; Amabile, 1993; Cavagnou, 2011). Job satisfaction is also linked to innovation performance because as already noted, positive organisational climate enhances motivation and increases the likelihood that employees will give discretionary effort to their work (Brown and Leigh, 1996; Neal and Griffin, 1999) and where the majority of employees experience job satisfaction, they will endorse rather than resist innovation and work collaboratively to implement as well as to generate creative ideas (Shipton et al., 2006).

The links between employee outcomes, commitment and job satisfaction and organisational innovation outcomes further explain the mediating effects of innovation climate. The strong links between innovation climate and both commitment and job satisfaction echo research undertaken by Brown and Leigh (1996), which showed that

positive organisational environment is positively related to productivity through the mediation of job involvement and effort. This provides further support for the thesis that innovation climate mediates the relationships between organisational innovation strategies and innovation outcomes *because* it increases commitment and job satisfaction.

8.6 Significance of Overall Model in Understanding the Link between Strategies and Outcomes and Revealing The 'Black Box' in HR

The strong support for the research model linking organisational innovation strategies with innovation outcomes, mediated by innovation climate, provides an important foundation for better understanding the microfoundations of innovation in organisations and an approach to developing innovation capability. Significantly, it helps to address one of the most persistent unresolved questions in the strategic human resource management literature: understanding the relationship between strategies and outcomes or the 'black box' problem in HR (Becker and Gerhart, 1996; Guest, 2001, 2011; Boselie et al., 2005; Takeuchi et al., 2007). This causal link or 'explanatory void' (Harney, 2009, p. 7) has remained largely unexplained since it was first identified almost two decades ago by Becker and Gerhart (1996). David Guest recently acknowledged that 'after *two decades of extensive research, we are still unable to answer core questions about the relationship between human resource management and performance'* (Guest, 2011, p. 3). The 'black box' exists because of the complexity of the potential causal mechanisms that can provide satisfactory explanations as to why particular strategies lead to particular outcomes. This causal complexity and ambiguity (Becker and Gerhart, 1996) is also complicated by the fact that these mechanisms are deeply embedded in the organisation and are 'path dependent' so they create particular challenges for researchers. Despite the importance of providing answers to this persistent question, the mediating effects of key variables in the strategies-performance link have been largely neglected and unexplained (Boselie et al., 2005).[4]

[4] For example a review of 104 articles by Boselie et al. in 2005 confirms that investigating the mediating effects of key variables in the strategies- performance link has been largely ignored.

The findings from this research and the strong support for the research model contribute to an understanding of the link between strategies and outcomes and most especially innovation outcomes. Innovation outcomes have received much less attention in HR–performance studies, studies which have largely concentrated on other performance outcomes such as financial outcomes, productivity, profit figures, market value or quality (Savanevicienne and Stankeviciute, 2010). It can be argued that because innovation is an integral part of organisational processes and its outcomes directly emerge from these processes, it is a more proximal outcome than financial or market outcomes which are more distal in nature. The embeddedness of innovation processes and the proximal nature of the outcomes can therefore provide more useful insights into the nature of causality than more distal outcomes which are affected by many extraneous factors. Importantly also, this study has surveyed the responses of employees from a large national sample whereas previous studies have been predominantly based on the responses of employers (Wall and Woods, 2005; Harney, 2009; Guest 2011). Advocating for more research seeking the views of workers, and exploring more proximal outcomes to better understand the relationship between strategies and performance, Guest advises that '*we would expect a stronger association between HRM and proximal rather than distal outcomes'* (2011, p. 10). In moving the debate on causality forward, the key role of employees is now being more fully recognised and the importance of workers perceptions and actions is increasingly seen as the key to understanding the link between strategies practices and performance (Guest, 2011). The findings from this research can therefore make an important contribution to this understanding.

The identification of innovation climate strength as an important mediator in the relationship between organisational innovation strategies and innovation outcomes is therefore significant. It helps to provide a deeper understanding of how different strategies are working and affecting employee perceptions and behaviours and also how different strategies can have different effects on employees and interpersonal relationships within the organisation. As discussed in Chapter 4, while HR systems serve as a broad-based influence on employee innovation behaviour within organisations, it is the intermediate socio-cognitive environment which stem from these systems which provide evidence that these systems are effective (Takeuchi et al., 2007; Mossholder et al., 2011). It is these environments, measured in this study as innovation climate, which influence most strongly the behaviours of employees. HR systems influence employee climate perceptions by

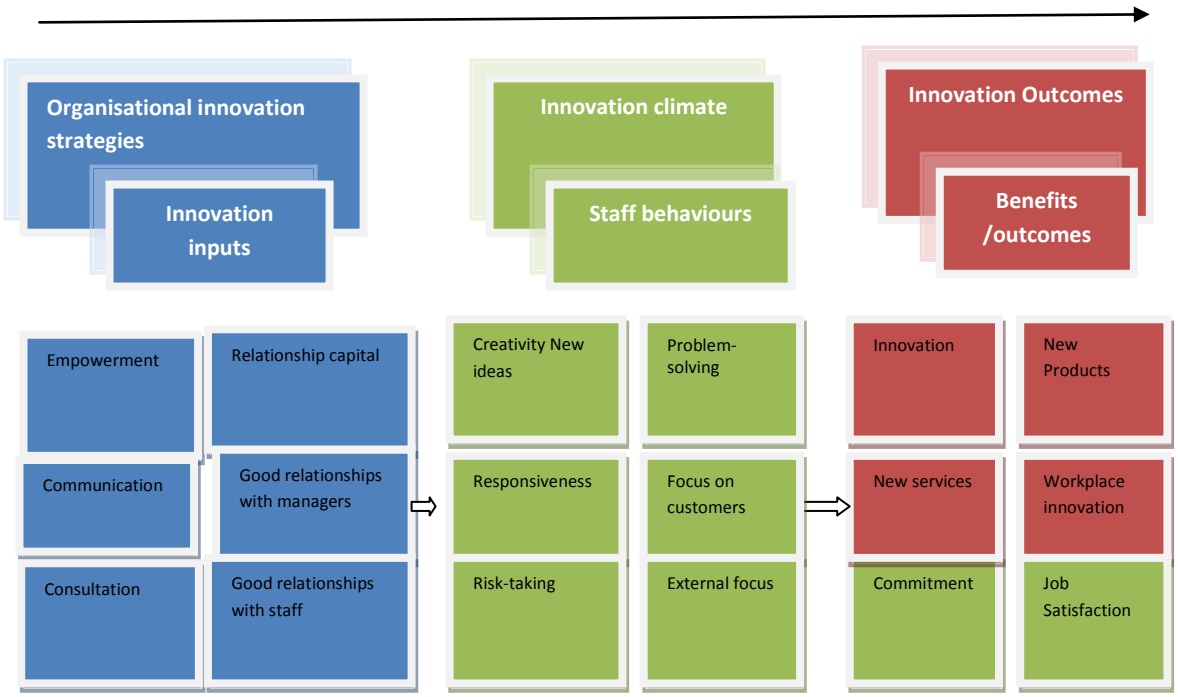
symbolically framing (Rousseau, 1995) and communicating key organisational values and behaviours. However, how HR systems are received and perceived by employees varies considerably and systems that are intended are often not experienced by employees for whom they are designed (Anderson and West, 1998; Purcell and Hutchison, 2007). This research strongly supports climate as a powerful social mechanism through which the effectiveness of intended HR systems for innovation can be measured and how HR systems can influence employee perceptions, beliefs and values. Significantly too they provide valuable insights into how to affect employee behaviour and begin to build organisational capability for innovation.

8.7 Towards a Model for Developing Innovation Capability

Bringing together the various strands of these findings, it is possible to examine their import in designing approaches to influence employee behaviour and dispositions towards innovation and thus building capability for innovation. A summary is presented in Figure 8.2. The figure outlines how the model explored in this study offers insights into developing the microfoundations of dynamic capability for innovation. These findings confirm that much can be learned from linking the theory of dynamic capabilities to theories of strategic human resource management and in particular strands of the HRM literature including High Performance Work Systems and organisational innovation. In turn the findings on the role of innovation climate can contribute to an elucidation of the link between HR strategies and organisational outcomes and performance and thus address the many unanswered questions inherent in the dynamic capabilities framework (Kratz and Zajac, 2001; Easterby-Smith, 2009; Bareto, 2010). Indeed it is proposed that these findings have significance for the research on understanding and developing the microfoundations of dynamic capabilities (Teece et al., 2007; Abell et al., 2008). The significance of the model and the findings to the dynamic capabilities framework will be the subject of the next chapter.

Figure 8.2: Microfoundations of Dynamic capability

(Abell et al., 2008).



8.8 Summary

The study has detailed how empowerment-enhancing strategies, relationship capital and access to training are strongly associated with innovation outcomes. Unpacking this further it has demonstrated that innovation climate is an important mediator in the relationship between organisational innovation strategies and innovation outcomes providing a valuable insight into addressing the innovation 'black box' (Becker and Gerhart, 1996; Guest, 2001, 2011: Boselie et al., 2005; Takeuchi et al., 2007; Harney, 2009). The findings contribute to an understanding of the link between organisational innovation strategies and outcomes notably innovation outcomes. A key strength of the findings stems from their reliance on responses from employees, subjects typically neglected in both HR and dynamic capabilities literatures (Wall and Woods, 2005; Abell et al., 2008, Felin and Foss, 2005, 2009; Harney, 2009; Savanevicienne and Stankeviciute, 2010).

Overall support for the model as proposed in this research provides an important foundation for understanding the dynamics of innovation in organisations and in developing organisational innovation capability. The findings from this study demonstrate that innovation climate is a very important element in organisational innovation and a key consideration in the development of dynamic capability for innovation. Measuring innovation climate is an authentic way of ascertaining whether intended HR strategies are having the desired effect on employee perceptions and behaviour (Anderson and West 1998; Purcell and Hutchinson, 2007). However, the findings show a very weak link between innovation climate and lower stress levels. In this they do not support the preponderance of studies (Claxton, 1998; Lansisalmi and Kivimaki, 1999; Hunter et al., 2007) on creativity and innovation which have demonstrated that low stress levels are important for creativity and innovation to occur. The relationship between formal training and innovation climate in this research also disconfirms the view of the centrality of formal training in the literature on organisational innovation, innovation climate and in the literature on dynamic capabilities.

The potential significance of these overall findings in relation to dynamic capability theory is explored in the next chapter.

Chapter Nine: Discussion: Microfoundations of Dynamic Capability

9.1 Introduction

Following the discussion of findings in the previous chapter, it is proposed that the evidence from this research can contribute to unlocking some of the unresolved problems in building dynamic capabilities for innovation. Building on the integration of the dynamic capabilities and human resource management literatures and the findings from the research investigation, this chapter proposes an illustrative approach to building dynamic innovation capability from microfoundations. While the theory of dynamic capabilities provides an important theoretical framework for the study of innovation (Zollo and Winter, 2002; Thompson, 2007), to date it has been deficient in linking the development of capabilities with organisational strategies which affect behaviour, and foster relevant outcomes (Kraatz and Zajac, 2001; Priem and Butler, 2001; Cepeda and Vera, 2007; Ambrosini and Bowman, 2009; Helfat and Peteraf, 2009; Barreto, 2010). This study begins to address this gap by linking the theory of dynamic capabilities to theories of strategic human resource management and in particular, organisational innovation and innovation climate strands of HR, in order to understand and develop the microfoundations of dynamic capabilities (Teece, 2007; Abell et al., 2008; Felin and Foss, 2009, forthcoming).

This study has identified dynamic capabilities theory as an important theoretic framework for the study of innovation in organisations because it is concerned with bringing about rapid organisational change. It also grapples with the elusive problems of knowledge management and learning, areas that are central to innovation (Teece and Pisano, 1994; Teece et al., 1997; Eisenhardt and Martin, 2000; Zollo and Winter, 2002; Kogut and Zander, 1995; Easterby–Smith et al., 2009). The core underlying theory of dynamic capabilities is the capability to interact with the resource base so as to *reconfigure* and *refresh* existing resources and *create* new ones (Ambrosini and Bowman 2009, p. 29). However, because people will tend to abandon creative actions in favour of habitual routines (Ford, 1996; Cavagnou, 2011), reconfiguring human resources and changing routines are difficult. Innovative organisations are therefore faced with the continuous challenge of disturbing and displacing familiar and repetitive routines and behaviours and replacing them with more risky and uncertain actions which lead to innovation. These creative behaviours are

very difficult to manage and sustain in organisations as they require a shift in perception and an abandonment of what is familiar and habitual in favour of the unknown and the less certain (Ekvall, 1997). The emergence of the theory of dynamic capabilities in the 1990's (Teece and Pisano, 1994; Teece et al., 1997) can be viewed as a considerable breakthrough in framing and conceptualising these internal change processes. Because the theory deals with the mechanisms of change, (for example Kontoghiorghes et al., 2005, equate product and service innovation with rapid change adaptation), it is connected to innovation, organisational learning and knowledge management (Kogut and Zander, 1995; Easterby-Smith et al., 2009).

However, there are problems in applying the theory to the study of innovation and in developing the internal change processes that affect innovation capability and outcomes. In general, there is limited consensus on the application of the theory to practice, while more specifically an understanding of the foundations and building blocks of these strategic capabilities has not been developed or articulated (Abell et al., 2008; Barreto, 2010). This chapter offers an approach to addressing these issues. The research findings illustrate how organisational innovation strategies and innovation climate are linked to innovation outcomes thereby animating the deficiencies of dynamic capabilities theory and better capturing microfoundations. The chapter begins by summarising the underlying weaknesses in the dynamic capabilities framework. Drawing on the integration of literatures and the empirical findings from this study, a developmental approach to building dynamic capabilities from micro to macro level is proposed. This approach is synthesised in a model which illustrates linkages between organisational strategies which affect behaviour and build capabilities and the development of higher-order strategic dynamic capabilities.

9.2 Problems with Dynamic Capabilities Theory

The significance of dynamic capabilities and their impact in informing research cannot be denied. However, such dominance also invites important conceptual and empirical scrutiny. The key underlying problems and contradictions in the dynamic capabilities framework were considered in detail in Chapter 3. This section summarises the main issues and concerns which this study seeks to address by way of five key areas related to; the nature and essence of dynamic capabilities theory, the neglect of the role of employees, the role of change and changing resources and routines, the importance of integrating the 'tacit' knowledge of employees and finally, levels of analysis.

9.2.1 Nature and Essence of Dynamic Capability

Firstly, in outlining an approach to the development of the microfoundations of dynamic capabilities, this study aims to address one of the most fundamental tensions in the framework, the confusion that surrounds the understanding of the nature and essence of dynamic capability theory itself. The proliferation of definitions, the amount of criticisms that the theory has generated and the elusive nature of the underlying concepts continue to cause difficulty (Helfat and Peteraf, 2009; Barreto, 2010). Because of these tensions, the debate has been predominantly focused on defining the nature of dynamic capabilities (Kraatz and Zajac, 2001; Easterby–Smith et al., 2009) and less on understanding the evolution and development of these high performing change capabilities. These underlying problems of definition and the tensions in understanding the nature of dynamic capabilities arise from a tendency to consider dynamic capabilities in abstractions rather than as encompassing the organisational processes and competencies which can be undertaken to develop such capabilities. This is understood by Abell and his colleagues who claim that '*while routines and capabilities are useful shorthand for complicated patterns of individual action and interaction, ultimately they are best understood at the micro level*' (2008, p. 489). By linking dynamic capability theory more comprehensively with that of strategic human resource management, this study offers explanations on how dynamic capabilities can be built from human resource management strategies designed to generate more strategic higher-order capabilities.

9.2.2 Neglect of the Role of Employees

Secondly, the study aims to address the role of employees which has been neglected in the theory of dynamic capabilities. The role of employees is of central importance because the theory is founded on an evolutionary economics perspective highlighting the roles of routines, path dependencies and organisational learning (Bareto, 2010). These are capabilities which are inherently concerned with human behaviour and motivation. In their influential definition of dynamic capabilities, Teece and his colleagues (1997) afford central importance to strategic management and it is said that dynamic capabilities therefore privileges management (Thompson, 2007). Yet a fundamental challenge in building dynamic change capability, relates to changing the collective behaviour of employees together with their associated routines, work patterns and daily activities. Much of the dynamic capability literature is concerned with changing behaviour - building and reconfiguring

internal and external competencies (Teece et al., 1997), modifying the resource base (Helfat and Peteraf, 2009) which must include the human resource base, changing routines, changing behaviour and collective activity (Eisenhardt and Martin, 2000; Zollo and Winter, 2002) and ultimately changing the abilities, capacities, processes and routines of the firm (Bareto, 2010). Changing behaviour on this scale and changing collective behaviour requires resolute human action and endeavour on the part of management and employees. Yet very little in the literature is devoted to employees or their perspectives.

9.2.3 Change: Changing Resources and Routines

Thirdly because of the lack of attention to the role of employees, it can be argued that the framework does not adequately articulate the determinants of change in organisations. The theory of dynamic capabilities emphasises two underlying levers for change; one is the capability to reconfigure and realign resources and the second is the ability to adapt and to change routines (Eisenhardt and Martin, 2000). Reflecting a Penrosian logic (1959), it is the manner in which firms utilise and reconfigure their resources that is significant rather than the mere existence of the resources themselves. However, the theory does not address the alignment and reconfiguration of the human resource base. Similarly in relation to routines, without an underlying understanding of how to affect collective behaviour and wean employees away from routines which have become embedded and to which they are attached, there is an oversimplification of a very complex phenomenon (Ford, 1996; Arend and Bromley, 2009). Changing routines and building the organisational systems which support creative behaviours are considerable in scale and complexity because routines '*structure a large part of organisational functioning at any particular time*' (Nelson and Winter, 1982, p. 97) and these challenges are not sufficiently explained in the dynamic capabilities framework. This suggests the importance of organisational wide initiatives which are purposefully directed at fostering desired employee behaviours.

9.2.4 Exploiting and Integrating Employee 'Tacit' Knowledge

Neglect of the role of employees in dynamic capabilities theory illuminates a further significant deficit in the theory, namely the exploitation and integration of the tacit knowledge that resides in the members of the organisation. Knowledge is increasingly seen as indistinguishable from the '*knower*' (Wenger, 2001, p. 68). If knowledge cannot be separated from the knower (Polanyi, 1966), knowledge is therefore a distributed activity in an organisation and the role and significance of the knowers or employees is of paramount importance. Policies on the mobility of workers, employee involvement and engagement arrangements, workplace learning, team working and the use of more flexible structures in organisations are required to exploit local and tacit knowledge and increase accessibility. The dynamic capability theory is largely silent on such processes.

9.2.5 Level of Analysis: Micro and/or Macro

Fourthly, as well as the unresolved question of definition, there is confusion regarding the level of analysis and little understanding of the development of dynamic capabilities from micro to macro level. Dynamic capabilities are generally regarded as higher order capabilities (Teece et al., 1997; Winter, 2003; Helfat and Peteraf, 2009), yet they are best understood through the processes in which they are exercised (Eisenhardt and Martin, 2000). While the original authors (Teece et al., 1997) noted their importance as higher order capabilities, they are also underpinned by more systematic operational routines (Winter, 2003) or production routines (Aungier and Teece, 2006). In addressing this issue Teece (2007) looks at the microfoundations of dynamic capabilities. He identifies three categories of microfoundations; sensing and shaping capabilities; seizing capabilities; and managing threats and reconfigurations. However, arguably these are in themselves higher order capabilities and not as he suggests microfoundations; there is a degree of circularity to his argument. In contrast, this study proposed that microfoundations are further down the organisational value chain and are more related to lower order routines, activities and practices. Despite Teece's attempt to refine his theory and address microfoundations, the problem remains because there is little distinction between macro and micro and there has been no consistent attempt to build explicit microfoundations which provide an explanation as to the origins of dynamic capabilities and how they might be built (Abell et al., 2008). This study was aimed at addressing this deficiency, by exploring the lower order processes which offer explanations on possible sources of dynamic capabilities or

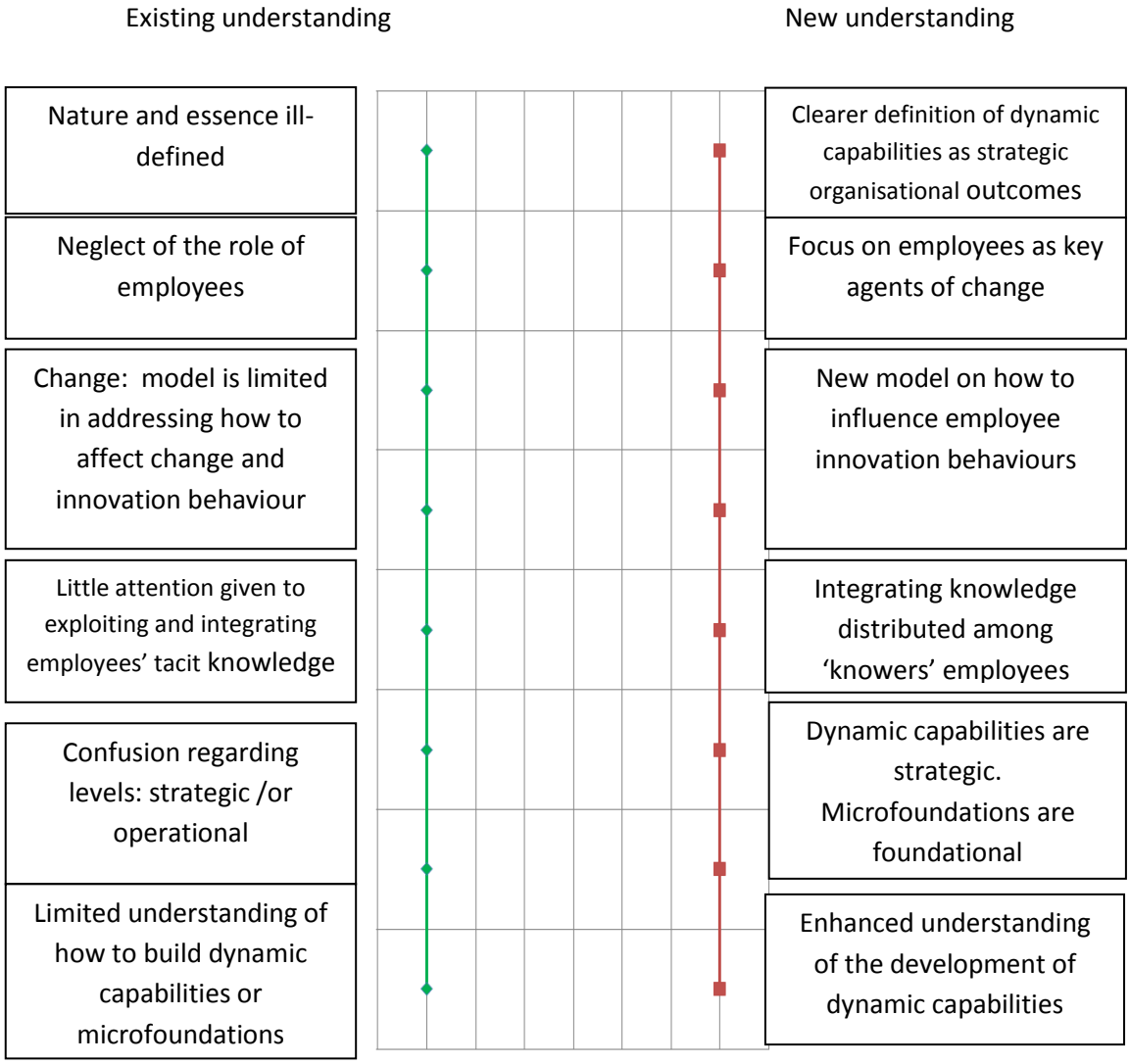
microfoundations, and in turn assessing the link between these microfoundations and higher order dynamic capabilities.

This process of disaggregation can also provide answers to the question of the value of dynamic capabilities. Some argue that their value lies in the resource configuration that they bring about and not in the capabilities themselves (Easterby-Smith et al., 2009). However, if the essence of the theory of dynamic capabilities is the capability to interact with the resource base so as to reconfigure and refresh existing resources and create new ones (Ambrosini and Bowman 2009, p. 29) then this implies that dynamic capabilities are valuable in themselves. By understanding the underlying elements, it is possible to determine a hierarchy of value such that capabilities as they develop and mature from underlying processes increase in value and in time become rare, valuable and inimitable.

In summary, it is evident that there are tensions and fault lines in the foundations of the dynamic capabilities framework that have the potential to undermine its credibility and limit its application. There are problems with definition and lack of specificity; little explanation or explication of the underpinning competencies or their evolution and development; lack of clarity relating to the level of analysis, strategic or operational and confusion relating to higher order capabilities and lower order processes and routines. Most pressingly, the lack of analysis of the role of employees and the lack of references to their perspectives, motivation or role in delivering innovation and change is a considerable shortcoming in the overall framework.

A summary of the main issues and concerns which this study proposes to address are outlined graphically in Figure 9.1.

Figure 9.1: Dynamic Capabilities: Gap Analysis



9.3 Towards a Greater Understanding of the Development of the Microfoundations of Dynamic Capabilities for Innovation

In attempting to address the inherent problems in the dynamic capabilities framework, this study links the domains of dynamic capabilities with that of human resource management. Drawing on the evidence from the combined literatures and the research undertaken in this study, an illustrative framework is provided here to offer insight into the development of the microfoundations of dynamic capability for innovation. Following the microfoundations logic and building on the arguments of the previous section, it is proposed to disaggregate the elements of dynamic capabilities into three stages of development. Stages 1 and 2 align with the microfoundations of dynamic capabilities (Abell et al., 2008; Felin et al.,

forthcoming) while stage 3 reflects the evolution of capabilities from microfoundations to higher dynamic capabilities (Teece, 2007):

Stage 1: HR architecture**:** Organisational innovation strategies

Stage 2: Innovation Climate; Change capabilities and innovation supporting behaviours

Stage 3: Dynamic capabilities as higher-order strategic organisational outcomes

Bringing together evidence from the current research, each stage is now discussed in turn.

9.3.1 Stage 1: HR Architecture: Organisational Innovation Strategies

At this foundational stage, are the inputs or human resource management strategies which are purposefully designed by management to affect the behaviours and attitudes of employees. These are outlined in Table 9.1. The strategies when combined correctly can form part of a complementary ***bundle of practices*** (MacDuffie, 1995; Ichniowski et al., 1997; Subramony, 2009) which help create a culture or climate of innovation. These combined organisational innovation strategies represent guiding principles or the '*architecture'* (Becker and Gerhart, 1996. p. 786) of the inputs designed to build innovation capability.

Table 9.1: Stage 1: HR Architecture: Organisational Innovation Strategies

Stage 1 : HR Architecture: Organisational innovation strategies	
Organisational innovation strategies	**Microfoundations of dynamic capabilities**
Empowerment strategies ***Communication*** ***Consultation*** **Relational capital strategies** ***Good relationships with managers*** ***Good relationships between staff members*** **Learning and development strategies** ***Training opportunities***	**Microfoundations** **Lower order activities and processes** **Routines designed to change routines** **HR Innovation *architecture* (Becker and Gerhart,1996)** **HR system (Rousseau,1995)** ***Intended* strategies (Purcell and Hutchinson, 2007)** ***Articulated* strategies(Anderson and West, 1998)**

In this research the complementary bundle of strategies which were shown to affect innovation outcomes are *empowerment-enhancing strategies*, communication and consultation; *relational capital,* good relationships between managers and staff and good relationships between staff members; and to a lesser extent *employee training* strategies. Because these practices are the first stage in building capability and because they are characterised by routines and practices, they can be considered lower order capabilities**.** They increase in value when there is evidence that the strategies are successful and are enacted and implemented rather than merely articulated (Anderson and West. 1998; Purcell and Hutchinson, 2007) in policies and strategy statements. At this level the activities and behaviours relate to the two potential underlying levers for change in the dynamic capabilities framework, resources and routines (Eisenhardt and Martin, 2000). These strategies are designed to create a particular environment for innovation and to change the human resource base at foundational level, in other words change the collective behaviour of employees.

Similarly in relation to routines, strategies which promote empowerment, learning and good relationships help to create structures and systems that involve employees in particular routine behaviours. It is not known as yet what the outcome of these strategies and practices will be because much will depend on *how* they are implemented and more importantly how they are perceived and received by employees (Wright and Nishii, 2006; Ehrnrooth and Bjorkman, 2012). Also, the patterns which underpin these routines will depend on the interaction between a number of actors (Becker, 2004). Hence in the table reference is made to intended and articulated strategies (Anderson and West, 1998; Purcell and Hutchinson, 2007)

Introducing such strategies and practices at this stage is relatively easy but ensuring that they are implemented and effective is much more challenging and complex. The essence of the dynamic capability framework involves the capacity to develop and possess capabilities for changing capabilities and developing new ones (Bowman and Ambrosini, 2003) and the ability to interact with and *refresh and renew* the resource base of the firm (Ambrosini and Bowman, 2009, p. 29). Therefore, the foundational routines which build dynamic capability must be routines that are designed to flex and change themselves as well as creating the reflexive environment which will review and change other routines. Routines take time to develop and those who exercise them become attached to them as habits which are

difficult to change (Ford, 1996; Ekvall, 1997; Cavagnou, 2011). Introducing strategies and practices at this stage may not in themselves succeed in overcoming this challenge. The research undertaken in this study supports the role of some organisational innovation strategies in effecting a climate for innovation and thereby affecting innovation outcomes. However, some strategies such as training did not have the intended effect on a climate for innovation as intended strategies are not always realised in employee experiences and behaviours (Anderson and West, 1998).

9.3.2 Stage 2: Innovation Climate: Change and Innovation Supporting Behaviours

It is proposed that the second stage in building capability therefore is represented as Stage 2: Employee change and innovation supporting behaviours**.** These behaviours are the consequences of intended human resource management systems and practices (Anderson and West, 1998; Purcell and Hutchinson, 2007; Takeuchi et al., 2007; Mossholder et al., 2011) which have the desired effect of embedding a culture of acceptance of change and a supportive organisational environment for creativity, learning and knowledge sharing. This stage, constituting the change supporting behaviours of employees and managers, is outlined in Table 9.2.

Table 9.2: Change and Innovation Supporting Behaviours

Change and innovation supporting behaviours	
Innovation Climate	**Microfoundations of Dynamic Capabilities**
Innovation climate • New ideas readily accepted • Searching for new ways of looking at problems • Customer needs top priority • Prepared to take risks • Quick to respond when changes need to be made • Continually looking for new opportunities in a changing environment **Proximal/employee outcomes** • Increased commitment • Increased job satisfaction • Increased workload	**Employee change capabilities and behaviours** **Innovation behaviours** • New ideas • Creative problem-solving • Customer focus • Risk-taking • Responsiveness • External focus; new opportunities in a changing marketplace **Affective behaviours** ***Knowing; knowledge sharing*** • Knowledge capacities (Lichtenthaler and Lichtenthaler, 2009). • Knowledge sharing • Sharing tacit knowledge (Lundval et al., 2007) • ***Co-working*** • Helping behaviours (Chadwick and Dabu, 2009) • Reflexivity , trust (West et al., 2004) • Thriving at work ; Collective thriving • (Spreitzer and Sutcliffe, 2007) • Vigour (Seligman et al., 2005) • Positive emotions increasing energy (Shirom, 2007) ***Self-Actualisation, Challenge*** • Challenge, intellectual stimulation increased work pressure (Oldham and Cummings, 1996; Anderson and West, 1998; Ehrnrooth and Bjorkman, 2012) ***Committing*** • Intrinsically motivated (Amabile, 1988,1996) • Increased job satisfaction and commitment (Amabile, 1993; Brown and Leigh, 1996; Takeuchi et al.,, 2009; Shipton et al.,2006) • Flow (Csikszentmihalyi's 1990) • Thriving at work ; Collective thriving (Spreitzer and Sutcliffe, 2007) • Vigour (Seligman et al., 2005) • Positive emotions increasing energy (Shirom, 2007)

The combined effects of these particular bundles of organisational innovation strategies and strong innovation climate in the organisational value chain have the potential to create the organisational dynamics which are the foundations of strategic dynamic capabilities at a higher level. Firstly, they help build a strong innovation climate characterised by *innovation behaviours.* Secondly, they help to develop a positive work environment which fosters affective behaviours which support innovation as follows: **Knowing**: knowledge sharing and sharing of 'tacit knowledge'; **Co-working:** helping behaviours, reflexivity and trust; **Committing**: to increased productivity; **Self-actualisation:** challenge, intellectual

stimulation and increased workload. These innovation behaviours and affective behaviours will be elaborated upon in the following section.

9.3.2.1 Innovation behaviours

From the responses of employees in this research, the resulting innovation behaviours are as follows; employees generate and develop new ideas; they are proactive and creative in problem-solving and searching for new ways of looking at problems; they give customer needs priority; they take risks and tolerate failure; they respond quickly when changes need to be made; their focus is outward-looking and they explore the external environment extensively in searching for new opportunities. These innovation behaviours reflect the key dimensions of innovation climate as outlined in the literature (Ekvall and Ryhammer 1999; Patterson et al., 2005; Kontoghiorghes et al., 2005; Hunter et al., 2007). They also reflect the strong support for innovation from managers and the central importance of positive affective tone and good relationships with managers and between staff members (James and James, 1989; Isaksen et al., 1998; Patterson et al., 2005; Hunter et al., 2007).

Significantly also, they reflect the foundations of dynamic capability described by Teece (2007) as *sensing, seizing, and reconfiguration/ managing threats* capabilities. *Sensing* capabilities are those which enable the company to search internally and externally for new opportunities. An innovation climate in which employees are outwardly-focussed, exploring the external environment extensively in searching for new opportunities is a good foundation for developing sensing capability. *Seizing* capabilities are those which underpin the development of opportunities which are thrown up from the earlier sensing activities. An innovation environment in which employees generate and develop new ideas and are proactive and creative in problem-solving and searching for new ways of looking at problems, demonstrates capacities which lead to the development of *seizing* capabilities. Equally many of the innovation climate behaviours reflect the foundations of *reconfiguration and managing threats* capabilities, for example responding quickly when changes need to be made, giving customer needs priority and taking risks. These innovation behaviours are both internally and externally oriented providing for *internal and external integration* which is an important dynamic capability for innovation (Iansiti and Clark, 1994; Lichtenthaler and Lichtenthaler, 2009).

9.3.2.2 Affective behaviours

As well as creating an environment which encourages and supports innovation behaviours a strong innovation climate at this level fosters the critical innovation supporting affective behaviours considered below. The behaviours broadly reflect the underlying processes of dynamic capabilities identified from the literature review in Chapter 3 (See table 3.1). An initial attempt to disaggregate dynamic capabilities identified these processes are *learning processes; social interactions, and knowledge creation and knowledge management processes.* The study has demonstrated how these behaviours can be fostered, critically from the perspective of those actually conducting them, the employees. The affective behaviours supporting innovation at this stage 2 level are therefore the microfoundations which are laying the foundations for the development of strategic dynamic capabilities. These affective behaviours are considered below.

Knowing: knowledge sharing and 'tacit knowledge'

The favourable social relationships that are present at this level are an important part of the innovation process as they provide individuals with the motivation and opportunities to share crucial tacit knowledge (Jenson et al., 2007) and to contribute to the development of new knowledge (Nonaka, 1994; Kogut and Zander, 1995). Because knowledge is socially constructed (McAdam, 2000), these positive environmental conditions are conducive to the development of the social exchanges which help build important knowledge capacities, those generated and retained internally, *inventive, transformative* and *innovative* capacities and through interactions outside the firm, absorptive knowledge capacities (Lichtenthaler and Lichtenthaler, 2009). These favourable climate conditions help to develop, adapt and renew the knowledge base of the organisation to enable it to drive the innovation process and create products and services that match future customer expectations (Iansiti and Clark, 1994).

Maximising the role of employees in developing innovation capacities and capability is most critical in the area of knowledge development and growth. Increasingly, knowledge is seen as distributed throughout the organisation and because of the prevalence of tacit knowledge it is often indistinguishable from those who possess that knowledge or the '*knowers*' (Wenger, 2001, p. 68). All knowledge has a tacit dimension (Polanyi, 1966, 1983) and much of the knowledge in organisations is 'knowing' that is distributed throughout the organisation's employees (Tsoukas, 1996). Often this knowledge is latent and underutilised

as the capacity to transfer tacit to explicit or codified knowledge is complex. Moreover, the distinction between tacit and explicit of codified knowledge is often blurred. For example, following Nonaka's influential theory on the interaction and transfer of tacit to explicit knowledge, more recently the dichotomy between tacit and explicit or codified knowledge has been challenged (Gourlay and Nurse, 2005; Jakubik 2011). If all knowledge has a tacit dimension (Polanyi, 1966, 1983), then a multi-level approach to understanding knowledge and innovation is required (Tsoukas, 1996) and the role of employees is therefore critical in the process of knowledge generation, development and exploitation.

Committing: increased commitment and discretionary effort

The strong supportive innovation environment is linked to 'proximal' (Wright and Gardner, 2003) employee innovation outcomes such as increased commitment and increased job satisfaction and consequently related to productivity through the mediation of commitment and job satisfaction (Csikszentmihalyi, 1990; Amabile, 1993; Brown and Leigh, 1996; Takeuchi et al., 2009; Shipton et al., 2006). The research has demonstrated that innovation climate mediates the relationship between organisational innovation strategies and the employee outcomes of commitment and job satisfaction and that these proximal employee outcomes are positively associated with new product, service and workplace innovation. These findings may also suggest that a supportive climate of innovation and positive relationships also helps individuals to thrive and flourish at work and leads to collective thriving (Spreitzer and Sutcliffe, 2007) which in turn increases learning and problem-solving. Thriving and vigour are related to increased cognitive alertness and emotional energy (Seligman et al., 2005). As vigour and dynamism are closely related, it is expected that increased vigour and energy leads to greater levels of change and promotes skill building and learning (Shirom, 2007). These are the foundational element of dynamic capabilities.

Co-working: helping, reflexing and collaborating

This positive innovation environment nurtures collaboration and helping behaviours (Chadwick and Dabu, 2009) reflexivity and trust (West et al., 2004), where employees reflect on and collectively review current ways of working and suggest and implement changes to bring about improvements.

Self-actualising: challenge and stimulation

Intellectual stimulation and challenge (Oldham and Cummings., 1996; Anderson and West, 1998; Ehrnrooth and Bjorkman, 2012) are important dimensions of innovation climate. Together with strong relationships and positive collegial exchange (Hunter et al., 2007), acceptable levels of work pressure and stress can be understood as an integral part of this dynamic. Reflecting the dimensions of increased work challenge and stimulation, as employees feel more able, motivated and supported to be creative and give discretionary effort and investment to their innovation efforts, their work intensifies and their workload increases (Ehrnrooth and Bjorkman, 2012). However, empowerment is known to offset the negative relationship between work pressure and stress (Spreitzer, 1997) and in this environment increased challenge and workload which is self- generated and self-motivated can be seen as a positive force leading to self-fulfilment, creativity and innovation (Karasek, 1979; Karasek and Tores, 1998; Oldham and Cummings, 1996).

This stage, providing a positive and strong innovation environment, supports change and innovation behaviours, creating the organisational dynamics which are the microfoundations of strategic dynamic capabilities at the next level.

9.3.3 Stage 3: Dynamic Capabilities as Higher-Order Strategic Organisational Capabilities

At this higher stage, the proposed illustrative model views dynamic capabilities as *organisational outcomes* – higher order organisational capabilities that are the *consequences* of the complex processes and activities that are outlined in stages one and two. This ultimate or third stage in capturing the development of dynamic capability is outlined in Table 9.3.

Table 9.3: Stage 3: Building Dynamic Capabilities

Higher order capabilities
Dynamic capabilities as strategic outcomes • Sensing capabilities • Seizing capabilities • Reconfiguring capabilities • Invention, discovery capabilities and developing opportunities capabilities (Teece, 2007)
Knowledge management capabilities (Lichtenthaler and Lichtenthaler, 2009)
Internal/external integration (Iansiti and Clark, 1994)

The proposed model suggests that the combined effects of inputs from levels one and two are positively linked to innovation outcomes and increased levels of product, service and workplace innovation which demonstrates evidence of higher order innovation capabilities. In this context, Eisenhardt and Martin's (2000) theory that dynamic capabilities are in themselves tools, activities or processes is challenged because these capabilities emerge from such tools processes and activities further down the organisational value chain. These higher order strategic capabilities enable the firm to achieve strategic outcomes such as the introduction and development of new products and new services but the processes which build these capabilities are of a lower order.

Understanding dynamic capabilities as outcomes of complex, but purposeful (Helfat et al., 2007) and sophisticated organisational configurations, accords with Dosi and his colleagues' (2000) distinction between capabilities and routines. They describe capability as follows: capability is a '*a fairly large scale unit of analysis, one that has a recognisable purpose expressed in terms of the significant outcome it is supposed to enable, and that is significantly shaped by conscious decision both in its development and deployment'* (Dosi et al., (Ed.). 2000, p. 4). Capabilities are therefore distinguishable from organisational routines by virtue of their scale and size, their strategic nature and the significance of their outcomes and by the element of conscious decision-making that is involved in their deployment. There is also a temporal distinction; routines can be introduced and implemented in a relatively short period of time, whereas capabilities take time to develop and embed.

When these capabilities have been developed, they are then valuable, rare, inimitable and non-substitutable (Barney, 1991), as their development is complex and path dependent. The approach presented therefore offers a useful and pragmatic basis for understanding the development of dynamic capabilities for the very reason that microfoundations are amenable to purposeful managerial interventions as opposed to more abstract higher order capabilities. This enhanced understanding is summarised graphically in table 9.4 below.

Table 9.4: Proposed Approach to Mapping Dynamic Capabilities with Organisational Innovation and Innovation Climate

Innovation Outcomes
New products, New services, New workplace innovations

Stage 3
Higher order capabilities

Dynamic capabilities as strategic outcomes
Invention. discovery capabilities and developing opportunities capabilities
Sensing capabilities
Seizing capabilities
Reconfiguring capabilities (Teece, 2007)
Knowledge management capability (Lichtenthaler and Lichtenthaler, 2009)
Internal/external integration (Iansiti and Clark, 1994)

Stage 2 Innovation Climate

Proximal/employee outcomes
- Increased commitment
- Increased job satisfaction
- Increased workload

Innovation climate
- New ideas readily accepted
- Searching for new ways of looking at problems
- Customer needs top priority
- Prepared to take risks
- Quick to respond when changes need to be made
- Continually looking for new opportunities in a changing environment.

Stage 2 Employee change capabilities and behaviours

Innovation behaviours
- New ideas
- Creative problem-solving
- Customer focus
- Risk-taking
- Responsiveness
- External focus; new opportunities in a changing marketplace

Affective behaviours

Knowing; knowledge sharing
- Knowledge capacities (Lichtenthaler and Lichtenthaler, 2009).
- Sharing tacit knowledge (Lundval et al., 2007)

Committing
- Intrinsically motivated (Amabile, 1993,1996)
- Increased job satisfaction and commitment (Amabile, 1993; Brown and Leigh, 1996; Takeuchi et al., 2009; Shipton et al, 2006)
- Flow (Csikszentmihalyi, 1990)
- Thriving at work ; Collective thriving (Spreitzer and Sutcliffe, 2007)
- Vigour (Seligman et al., 2005)
- Positive emotions increasing energy (Shirom, 2007)

Co-working
- Helping behaviours (Chadwick and Dabu, 2009)
- Reflexivity , trust (West et al., 2004)

Self-Actualisation ; Challenge
- Challenge, intellectual stimulation increased work pressure

(Oldham and Cummings, 1996; Anderson and West, 1998; Ehrnrooth and Bjorkman, 2012)

Stage 1.
Organisational innovation strategies
Empowerment strategies
- Communication
- Consultation

Relational capital strategies
- Good relationships with managers
- Good relationships between staff members

Learning and development strategies
- Training opportunities

Stage 1
Micro Foundations

Lower order activities and processes
Organisational innovation *architecture* (Becker and Gerhart, 1996)
***Extrinsic* motivators** (Amabile, 1993,1996)

9.4 An Integrated Model for the Development of Dynamic Capabilities

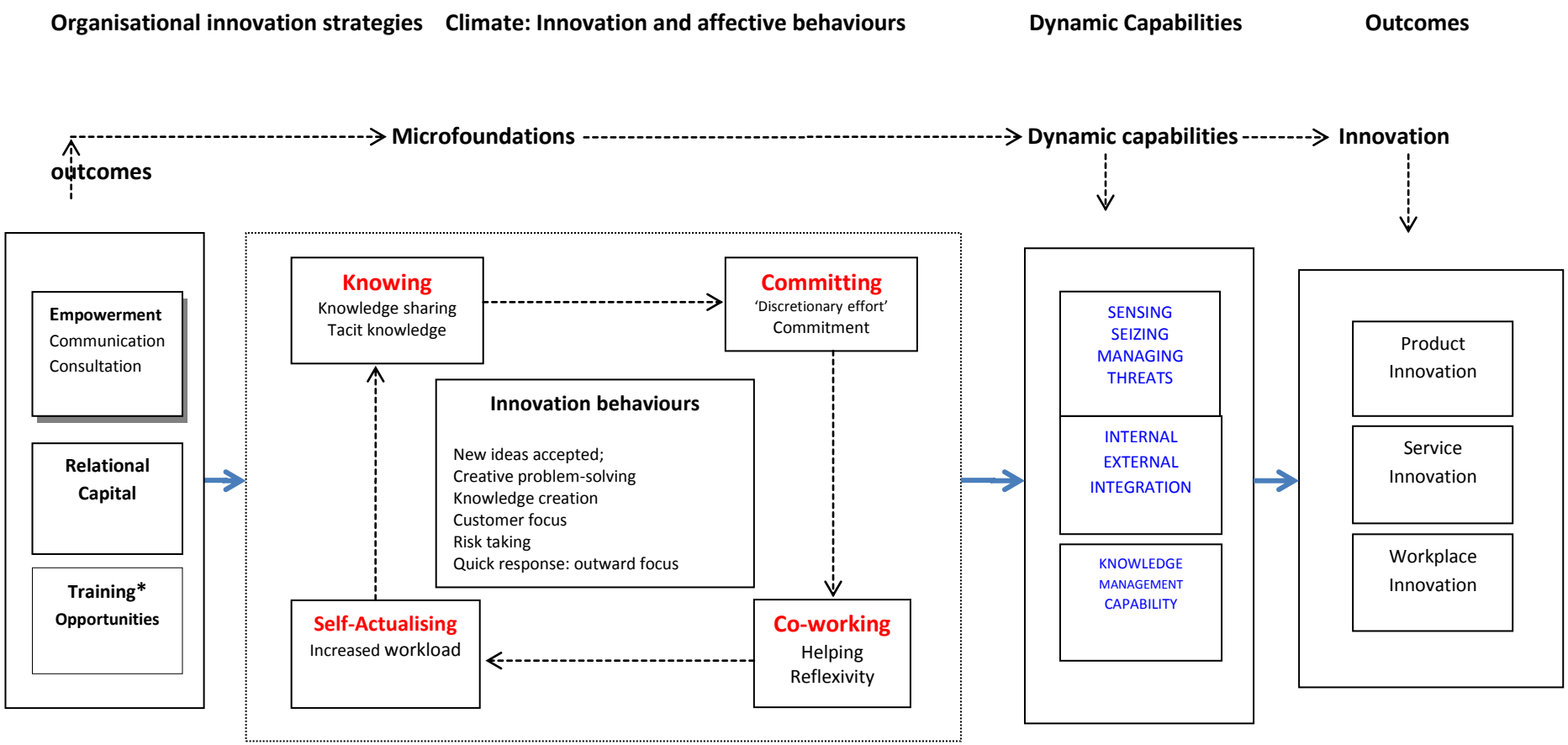
The evidence from the integration of the dynamic capabilities and human resource management literatures and this research investigation contribute to an understanding of the association between organisational innovation strategies, innovation climate and innovation outcomes, both employee outcomes and organisational outcomes. This study has demonstrated that organisational innovation strategies such as empowerment-enhancing strategies, relationship capital and access to training are strongly associated with innovation outcomes and that innovation climate is an important mediator in the relationship between organisational innovation strategies and innovation outcomes. These findings provide a valuable insight into addressing the innovation 'black box' in HR and potentially the microfoundations of dynamic capability (Becker and Gerhart, 1996; Guest, 2001, 2011; Takeuchi et al., 2007; Abell et al., 2008, Felin and Foss, 2005, 2009). Drawing from this research and the integration of the dynamic capabilities and human resource management literatures, an illustrative model is proposed and outlined in Figure 9.3. This model illustrates diagrammatically how the dynamic capabilities framework can be integrated with HR organisational strategies and systems that are designed to effect behaviour and build capability for innovation. This offers an illustrative framework for building dynamic capability for innovation, based on the developmental approach which has been outlined in this chapter.

The purpose of the model outlined in Figure 9.3 is to elucidate how research in the HR field can contribute to unlocking the microfoundations of dynamic capability, which to date has remained elusive because the dynamic capabilities framework has been confined by the parameters of the macro level tradition from which it has emerged. The proposed model therefore illustrates the potential that is created from linking the human resource management and the dynamic capabilities domains. This is but one approach but the potential for future research is considerable. For example, this study investigated a selective number of the possible organisational innovation strategies that are associated with innovation outcomes. However, as discussed in chapter 4, the Strategic Human Resource Management (SHRM) and High Performance Work Systems (HPWS) literatures linking strategies to performance outline a range of strategies or *bundles* of strategies (MacDuffie, 1995; Ichniowski et al., 1997; Subramony, 2009) which can be investigated using this approach. Future research could investigate the association between a more comprehensive bundle of HPWS practices and innovation outcomes than was undertaken in

this study. Equally there is potential for investigating particular aspects of the HPWS framework individually, areas such as staffing arrangements, merit-based performance management and appraisal systems, or incentive pay structures and flexible work arrangements (Applebaum, 2000; Combs et al., 2006; Lynch, 2007; Takeuchi et al., 2007; Guthrie et al., 2009, 2011). Using this framework also offers opportunities for investigating the potential of innovations in work design and new management systems such as Total Quality Management (TQM) to affect innovation outcomes and better understand the microfoundations of dynamic capability (Murphy 2002; Black and Lynch 2001, 2004; Lynch, 2007).

The proposed model is also designed to illustrate how aligning the domains of dynamic capabilities and human resource management offer new avenues for research which have potential benefits for both domains. The dynamic capabilities framework provides an important strategic focus for human resource management research which will further strengthen efforts to establish its strategic position in building innovation capability and competitive advantage. Future research can investigate how knowledge in the human resource management domain can contribute to the development of dynamic capabilities in innovation. The model can also be expanded to other domains of dynamic capability for example in project management, in international marketing, in mergers and acquisitions, and in building strategic alliances in emerging markets. The next section explains the model as outlined in Figure 9.2.

Figure 9.2: Proposed Integrated Model: From Microfoundations to Dynamic Capabilities



*While access to training was positively associated with new product, service and workplace innovation, innovation climate does not mediate the relationship between training and innovation outcomes.

The illustrative model progresses from left to right in moving from microfoundations to dynamic capabilities. The foundational level combines organisational innovation strategies which represent guiding principles or the '*architecture'* (Becker and Gerhart, 1996, p. 786) designed to build innovation capability. The next stage, which is central and dynamic, represents the change-supporting behaviours of employees and managers. These help build a strong innovation climate characterised by innovation behaviours and affective behaviours: *knowing*, knowledge sharing and sharing of 'tacit knowledge', *committing* to productivity through the mediation of job involvement and commitment, *co-working***,** helping behaviours (Chadwick and Dabu, 2009) reflexivity and trust (West et al., 2004) and *self-actualising,* embracing challenge, intellectual stimulation and increased workload. These behaviours build the organisational competencies and capacities which are the microfoundations of dynamic innovation capabilities. They represent the penultimate stage in the model and provide the foundation for the *sensing, seizing, reconfiguration / management of threats* capabilities (Teece, 2007) and *knowledge management capabilities* (Lichtenthaler and Lichtenthaler, 2009) which are the higher order strategic capabilities required for innovation and rapid change. These behaviours are both internally and externally oriented providing for *internal and external integration* which is an important innovation capability (Iansiti and Clark, 1994). Ultimately these capabilities lead to innovation outcomes, product, service and workplace innovation.

While the nature and essence of dynamic capabilities may remain somewhat elusive, this study has opened up approaches and new avenues that breathe life into the theory of dynamic capabilities by providing an understanding of the underlying organisational mechanisms and systems which underpin the dynamic capabilities framework. By disaggregating the processes, practices and routines which begin to create capability for innovation at lower levels in the organisational value chain, the model offers an illustrative evolutionary pathway through which dynamic capabilities can be systematically built.

9.5 Clarification of the Dynamic Capabilities Framework

As well as offering an illustrative framework on which to develop microfoundations and thus build dynamic capability for innovation, the approach outlined in this framework clarifies some of the confusion surrounding the nature and essence of dynamic capabilities. The clarifications arising from this study on the nature and essence of dynamic capabilities are summarised in the next section.

9.5.1 Dynamic Capabilities are Strategic Higher Order Capabilities

Dynamic capabilities, it is suggested, are strategic higher order capabilities but the processes, activates and routines which combine to develop and create them are lower order capabilities. The model views dynamic capabilities as organisational *outcome**s*** in themselves. Viewing dynamic capabilities as higher order organisational capabilities that are the *consequences* of particular complex processes and activities rather than being embodied in the activities themselves affords a clearer understanding of the nature of dynamic capabilities and how they can be developed. These higher order strategic capabilities enable the firm to achieve strategic outcomes such as the introduction and development of new products and new services but the processes which build these capabilities are of a lower order. This accords with Winter's (2003) view that the possession of dynamic capabilities and the outcomes of these unique configurations and processes are strategic but the organisational routines and repetitive nature of the implementation of these routines must be applied systematically at operational level.

9.5.2 Microfoundations: Organisational Innovation Strategies and Innovation Climate

The microfoundations of dynamic capabilities are the organisational innovation strategies and innovation climate which are employed through human resource management interventions. These are lower order routine activities but are not the microfoundations proffered by Teece (Teece, 2007) such as sensing, seizing, managing threats and reconfiguring, resources which themselves are higher order dynamic capabilities.

9.5.3 Perspectives and Motivation Of Employees are Central

One of the central findings of this study is that the role of employees is crucial in the dynamic capabilities framework and eliciting their views and perspectives is key to building dynamic capability. Getting an authentic account of the impact of particular HR strategies on employees themselves, their attitudes, dispositions and motivation and how this impacts on innovation performance is central to the model as proposed. Managing the interface between the introduction of organisational interventions and the impact of such interventions (Purcell and Hutchison, 2007; Takeuchi et al., 2007; Mossholder et al., 2011) as outlined in Level 2 of the proposed model, is the enabler of real change and innovation. It is this interface that provides the important information on the combined effects of particular strategies and interventions on the emotional, cognitive and social experiences of employees and ultimately on how their behaviours and dispositions towards innovation can be influenced. These help build a strong innovation dynamic characterised by innovation and affective behaviours such as knowledge sharing, co-working and committing (Kogut and Zander, 1995; Brown and Leigh, 1996; Takeuchi et al., 2009; Shipton et al., 2006).

A central tenet of this research is that organisations conduct regular climate surveys and systematically survey employees as to the effect of the introduction of certain practices, as management are not always aware of the effects of their interventions or the combined effects of particular bundles of strategies on employees or their performance (Harney, 2009; Guest 2011).

9.5.4 Changing Resources and Routines

Analysing the role of employees in innovation and eliciting their perspectives, disposition, motivation and actions, helps to develop an understanding of how to affect collective behaviour. This provides the foundation for developing a methodology for changing the routines of employees and building routines and activities which are aligned to creativity and innovation. The development of a model which directs collective behaviour towards innovation and creativity is effectively a realignment and renewal of the human resource base towards the development of microfoundations and ultimately dynamic capability in innovation. This accords with Penrose's (1959) assertion that it is the manner in which firms utilise and reconfigure their resources that is significant for innovation success rather than the mere existence of the resources themselves. It also addresses the challenge identified by Nelson and Winter (1982) that because defined routines form such a large part of organisational functioning, they are difficult to reconfigure and take time to change.

9.5.5 Building Dynamic Capabilities Requires Strategic Human Resource Management Capability

Maximising the contribution of employees by changing routines and modifying the human resource base, requires strategic human resource management capability. The capability to change, modify and reconfigure the resource base of the firm is fundamental to dynamic capability theory (Penrose, 1959; Teece et al., 1995; Ambrosini and Bowman, 2009). It is proposed that expertise in strategic human resource management is therefore required to refresh and reconfigure the human resource base in the organisation to achieve strategic innovation performance. This is particularly so in building innovation capability because contextual organisational factors are critically important in influencing employee creative behaviour (Rice, 2005). It is also important in the context of this study which is an exploration of innovation in organisational settings or experience-based innovation, the creation of new knowledge through the DUI mode of innovation, doing, using and interacting (Lundvall et al., 2007).

9.5.6 Value of Dynamic Capabilities

When fully developed, dynamic capabilities are then valuable, rare, inimitable and non-substitutable, VRIN (Barney, 1991) as their development is complex and path dependent. Dynamic capabilities are organisational outcomes, organisational capabilities that are the consequences of particularly complex combinations of processes and activities. In this context, when developed they are unique, path dependent and difficult to transfer but the processes that enable their development can be copied and are transferable. Their value increases along each stage of the developmental value-chain outlined in this model. The illustrative framework developed in this study shows how dynamic capabilities can be built from simple operational routines which are not particularly valuable or rare in themselves to more strategic higher-order capabilities which are valuable and rare because they are the outcomes of these complex and purposeful recombinations and strategies.

9.6 Summary

This chapter suggests a developmental approach to building the microfoundations of dynamic capabilities for innovation, based on the integration of dynamic capabilities and human resource management literatures and the findings from the research investigation. It offers an illustrative integrated model for building dynamic capability from microfoundations to macro level strategic higher order capabilities. The model proposes that the foundational level comprises the combined organisational innovation strategies which represent the '*architecture'* (Becker and Gerhart, 1996, p. 786) of the inputs designed to build innovation capability. The second stage in building capability represents the change-supporting behaviours of employees and managers which build a strong innovation climate characterised by innovation and affective *behaviours* supporting innovation performance. Central behaviours are *knowing,* knowledge sharing and sharing of 'tacit knowledge'; *co-working ,* helping behaviours reflexivity and trust (West et al., 2004; Chadwick and Dabu, 2009); *committing* to productivity through increased job involvement and job satisfaction (Brown and Leigh, 1996; Takeuchi, et al., 2009) and *self-actualising,* embracing challenge, intellectual stimulation and increased workload (Oldham and Cummings, 1996; Ehrnrooth and Bjorkman, 2012).

At the highest level are the sensing seizing and reconfiguring/managing threats capabilities and invention, discovery and developing opportunities capabilities as described by one of the original authors of the framework, Teece (2007). Knowledge management capabilities (Lichtenthaler and Lichtenthaler, 2009) internal/external integration capabilities (Iansiti and Clark, 1994) are also dynamic capabilities which present at this level. These dynamic capabilities lead to organisational innovation outcomes; product, service and workplace innovation.

The approach outlined in this illustrative framework clarifies some of the confusion surrounding the nature and essence of dynamic capabilities. This framework suggests that dynamic capabilities are *organisational outcomes* – higher order organisational capabilities that are the *consequences* of microfoundations and strategies and processes lower down the organisational capabilities value chain. They take time to develop and mature and when they have been fully developed, they are then valuable, rare, inimitable and non-substitutable (Barney, 1991) but the underlying organisational strategies which create these capabilities can be copied and replicated elsewhere. The role of employees is crucial in building dynamic capabilities as is expertise in strategic human resource management in

order to continuously *reconfigure and refresh* (Ambrosini and Bowman 2009, p. 29) the human resource base and align the behaviours, routines and motivation of employees to achieve strategic innovation outcomes.

Chapter Ten: Conclusion

10.1 Introduction

This study investigated the dynamics of innovation in organisations through an analysis of a large database of employee responses from the National Workplace Survey of Employees (2009), a survey which was commissioned and project managed by the researcher. The study links the dynamic capabilities framework with human resource management studies and suggests an approach to building the microfoundations of dynamic capabilities for innovation (Teece, 2007; Felin and Foss, 2005, 2009). The analysis of microfoundations is an emerging area in organisational and strategic management as it is increasingly recognised that the mechanisms in effecting change and collective behaviour cannot be fully understood at macro level (Abell et al., 2008; Felin et al., forthcoming). While the study identifies dynamic capabilities as an important framework for the study of organisational innovation, because the framework is located at macro level, to date it has not fully elucidated the micro level organisational strategies and processes which affect innovation behaviour and build capabilities (Kraatz and Zajac, 2001; Priem and Butler, 2001; Barreto, 2010; Helfat and Winter, 2011). This study addresses this gap by investigating the development of microfoundations from a human resource management perspective and by analysing the responses of employees.

The analysis demonstrates that organisational innovation strategies are positively associated with innovation outcomes and employee outcomes. Further, innovation climate mediates the relationship between strategies and outcomes including both innovation outcomes and proximal employee outcomes of job satisfaction and commitment (Wright and Gardner, 2003). This concluding chapter outlines the significance and potential impact of these findings and provides an overview of the main contributions of this research investigation. The chapter concludes by outlining research limitations before considering potential future research avenues.

10.2 Overview of Research Project

A key proposition underpinning this study is that understanding how firms organise themselves internally matters significantly, and must be positioned more strategically in national innovation policy and planning (Lazonick, 2003; Lundvall, 2007; Ramstad, 2009). The study shows that increasingly, the National Systems of Innovation (NSI) conceptual framework acknowledges that the firm is the core of the national system of innovation (Nelson and Rosenberg, 1993; Edquist, 1997; Lazonick, 2003; Lundvall, 1998, 2007; Balzat and Hanusch, 2004). However, it exposes a gap in understanding how innovation occurs within organisations and how to generate and sustain innovation in organisational settings. In seeking a conceptual understanding of the internal dynamics of innovation within firms, the study explored a number of economic theories of the firm, and in particular evolutionary economic theory. From this exploration the study identified dynamic capabilities as an important conceptual framework for the study of the internal dynamics of innovation in organisations (Teece and Pisano, 1994; Kogut and Zander, 1995; Teece et al., 1997; Eisenhardt and Martin, 2000; Zollo and Winter, 2002; Easterby–Smith et al., 2009). In applying the framework to practice however, the study highlighted some of the significant deficiencies of the dynamic capabilities framework because it is located in a macro-level tradition. As Abell and his colleagues state '*exactly how routines and capabilities are related to firm-level outcomes ….. is left unexplored and implicit*' (2008, p. 490).

To address this deficit, the study moved to explore how to foster the microfoundations of dynamic capabilities as it is only at the micro level that the intricate and complex patterns of individual and collective behaviour and attitudes can be understood (Felin and Foss, 2005, 2009; Abell et al., 2008). To explore how to affect individual and collective innovation dispositions and actions, the study linked dynamic capability literature to that of strategic human resource management (HRM) and in particular organisational innovation and innovation climate literatures (Anderson and West, 1998; Read 2000; Kontoghiorghes et al., 2005; Shipton et al., 2006; Patterson et al., 2005; Hunter et al. 2007). An empirical research model was developed based on an alignment of these perspectives. A research investigation was undertaken which analysed the responses of employees arising from a unique empirical opportunity presented by the availability of a large national database of employee responses. The research investigated how organisational innovation strategies are related to innovation climate and innovation outcomes in order to understand how to influence employee motivation and innovation behaviour and ultimately to gain insights into the development of the microfoundations of dynamic capabilities.

10.3 Overview of Main Empirical Findings

In building the organisational 'architecture' (Becker and Gerhart, 1996, p. 786) which supports innovation, the investigation showed that the strategies investigated in this study, (i.e. empowerment–enhancing strategies, communication and consultation, relational capital and access to training) are positively linked to organisational innovation outcomes, in the form of service innovation, product innovation and workplace innovation. These findings support previous studies which link these strategies with improved innovation performance (Read, 2000; Black and Lynch, 2004; Lam, 2005; Lundvall, 1998, 2007; Shipton et al., 2006; Lynch, 2007; McLeod and Clarke, 2009; Subramany, 2009). The findings also indicate a positive relationship between innovation strategies and proximal employee outcomes, job satisfaction and commitment. One notable exception is training which does not appear as significant to employees in shaping their commitment, wellbeing or innovation behaviour. As discussed in Chapter 8 (section 8.22) one explanation for this finding might be how training is defined in formal terms and the relevant meaning it holds for employees. It is likely that more informal learning and tacit knowledge sharing are the predominant learning modes which influence employee behaviour and dispositions in dynamic innovation contexts (Polanyi, 1966; Lundvall et al., 2007).

The empirical findings demonstrate that innovation climate mediates the relationship between organisational innovation strategies and both organisational outcomes and proximal employee outcomes (Wright and Gardner, 2003). They provide further evidence of the role of climate as a powerful mechanism through which HR systems influence employee perceptions, behaviours and values and are therefore an important element in understanding the impact of organisational innovation strategies (Rousseau, 1995; Takeuchi et al., 2009; Heffernan et al., 2009; Mossholder et al., 2011). Innovation climate is therefore a critically important element in organisational innovation and a key consideration in the development of dynamic capabilities for innovation and their underpinning microfoundations. An interesting exception occurred here with respect to wellbeing (see Chapter 8, section 8.4). The finding of weak links between innovation climate and wellbeing runs counter to a preponderance of studies on creativity and innovation which suggest that low stress levels are important for creativity and innovation to occur (Claxton, 1997: Lansisalmi and Kivimaki, 1999; Hunter et al., 2007). In contrast, it is possible that gains in innovation performance are related to increased workload and

increased work intensification (Guest, 2011). It is more likely, however, that these findings reflect good stress or *eustress* (Selye 1976a, 1976b), which is stress associated with individual stimulation and self-motivation generated by the complex and challenging nature of work involving creativity and innovation (Karasek, 1979; Karasek and Tores, 1998; Oldham and Cummings, 1996). Overall, in opening up empirical evidence from the perspective of employees, the research model examined, offers an important foundation for understanding the development of the organisational and HR *architecture* which fosters innovative behaviour (Becker and Gerhart, 1996, p. 786). Associated with this is an enhanced understanding of the dynamics of employee outcomes, including the thin line between challenge and stress.

10.4 Theoretic Contributions

Unless the findings outlined above are accompanied by adequate theoretical conversations and advancements, they will not be sufficient to enhance understanding. It is therefore critical to assess the implications of this research for theory development. Firstly, the study expands and refines extant knowledge in the area of dynamic capabilities. By integrating the domains of dynamic capabilities and strategic human resource management, the study expands the boundaries of dynamic capability theory which to date has been constrained by its location solely within a macro-level tradition. It refines the theory by beginning to offer a deeper understanding of the development of dynamic capabilities, an area which has remained unexplained since its inception in the early 1990s (Kraatz and Zajac, 2001; Laursen and Foss, 2003; Felin and Foss, 2005, 2009; Barreto, 2010). Secondly, by identifying innovation climate as a key mediating variable in the innovation strategies-innovation performance link, the findings from this research provide a valuable insight into addressing the innovation black box or explanatory void in strategic human resource management (Becker and Gerhart, 1996; Harney, 2009; Guest, 2011). Thirdly, the study expands extant knowledge in the emerging area of microfoundations by beginning to unlock the elusive link between micro-level foundations and macro-level capabilities (Gavetti, 2005: Abell et al., 2008; Felin et al., forthcoming; Hodgson, forthcoming). Finally, at a strategic national level, by identifying the internal organisational dynamics and arrangements which support organisational innovation, the study demonstrates that the manner in which firms organise themselves internally matters significantly to national innovation policy (Lazonick, 2003; Laursen and Foss, 2003; Lundvall, 2007; Bender and Laestadius, 2008; Ramstad, 2009). Each of these contributions will now be considered in turn.

10.4.1 Refining Dynamic Capabilities

The integration of the dynamic capabilities framework with the domain of human resource management and the subsequent research investigation has broadened the parameters of the dynamic capabilities framework, previously constrained by adherence to macro-level constructs and analysis. Up to now the theory of dynamic capability has been deficient in linking the development of capabilities with the organisational strategies and climate conditions which affect behaviour, and foster relevant outcomes (Cepeda and Vera, 2007; Abell et al., 2008; Ambrosini and Bowman, 2009; Barreto, 2010). The study has addressed this deficiency by disaggregating the dynamic capabilities framework and linking it with human resource management to better understand the micro level organisational strategies and innovation supporting climate and behaviours which build the foundational architecture of capabilities. The integration of literatures and the resulting investigation and analysis has begun to unlock understanding of the development of dynamic capabilities and provides important insights into how their underpinning micro-level processes and motivations are developed and aligned. This study endorses the belief that macro-level capabilities can only be fully explained by understanding their underlying micro-level processes and the motivations of the individuals or employees who undertake and participate in these processes (Felin and Foss, 2005, 2009: Abell et al., 2008). The analysis has confirmed that understanding human resource management is fundamental to understanding the development and maintenance of organisational innovative capabilities (Thompson, 2007; Wang et al., 2012). The integration of literatures, the alignment of commonalities in underlying processes and the subsequent research investigation linking strategies, climate and innovation outcomes can be viewed as an important step in linking macro-level capabilities with micro-level organisational foundations and in filling the void in understanding the evolution of dynamic capabilities (Felin and Foss, 2005, 2009; Abell et al., 2008).

Significantly, from the review and integration of the literatures, the study has identified employees as the missing link in the dynamic capabilities evolutionary framework. Employees or empowerment-enhancing strategies do not feature in the dynamic capabilities literature. However, employee empowerment strategies are prominent in organisational innovation and innovation climate literatures linking strategies to innovation performance (Read, 2000; Patterson et al., 2005; Hunter et al., 2007; Shipton et al., 2006; McLeod and Clarke, 2009). Explicitly incorporating and understanding the role of employees makes a significant contribution to the development of dynamic capabilities theory from a

number of important perspectives. It addresses how to exploit and integrate the repository of tacit knowledge that resides in the members of the organisation. As knowledge is now seen as indistinguishable from '*the knower*' (Wenger, 2001, p. 68) and for some '*tacit knowledge constitutes the origin of all knowledge*' (Lam, 2005, p. 125), mechanisms for sharing and releasing tacit and often latent knowledge are central to innovation which is essentially about the creation of new knowledge. Knowledge is a distributed activity in an organisation and effecting the behaviours and motivation of knowers i.e. employees is of paramount importance.

Understanding the complex underlying mechanisms which help to develop dynamic capabilities provides a foundation for understanding employee routines and reconfiguring the human resource base which is the underpinning and founding challenge in the dynamic capabilities framework (Penrose, 1959; Teece et al., 1997). Understanding the role of employees also addresses the challenges of size and organisational inertia. Because defined routines form such a large part of organisational functioning, they are difficult to reconfigure and take time to change (Nelson and Winter, 1992). Equally, because creativity requires a shift in attitude and movement away from what is familiar and habitual to that which is unknown (Ford, 1996; Ekvall, 1997; Cavagnou, 2011), it is difficult to manage and sustain in organisations. Understanding the motivation and behaviour of employees who engage with and own these processes helps to overcome these challenges.

Understanding the underlying processes and activities which support the evolution of dynamic capability for innovation significantly strengthens the foundations of the dynamic capabilities framework. By distinguishing micro level strategies, behaviours and processes from macro level capabilities, and establishing a hierarchy of routines as Chandler (1992) advocated, the study helps address some of the confusion surrounding the definition and nature of dynamic capabilities. The model which has been developed positions dynamic capabilities as organisational outcomes in themselves. They take time to develop and mature and when they have been fully developed, they are then valuable, rare, inimitable and non-substitutable (Barney, 1991). Positioning dynamic capabilities as higher order organisational capabilities that are the consequences of particular complex processes and activities rather than being embodied in the activities themselves, affords a clearer understanding of the nature of dynamic capabilities and how they can be developed.

10.4.2 Unlocking the Innovation Black Box

The findings from this research provide a valuable insight into addressing the 'black box' problem in strategic human resource management (Becker and Gerhart, 1996; Guest, 2001; Boselie et al., 2005; Takeuchi et al., 2007; Harney, 2009). By establishing an association between organisational innovation strategies and innovation outcomes and by identifying innovation climate as a key mediating variable in the strategies-innovation performance link (Boselie et al., 2005), the study helps to illuminate why and how particular strategies are linked to increased innovation outcomes. The findings from this study, based on responses from employees, contribute to an expanded understanding of the causal links between organisational innovation strategies and outcomes and most especially innovation outcomes, an area that has received little attention in previous HR–performance studies (Laursen and Foss, 2003; Savanevicienne and Stankeviciute, 2010). Importantly also, the unexpected lack of support for wellbeing in the model under investigation sounds a note of caution. This finding provides evidence of the unpredictable nature of causality and indicate that positive supportive strategies may not always result in universally positive outcomes (Geary and Trif, 2011; Ehrnrooth and Bjorkman, 2012).

10.4.3 Developing Microfoundations

Arising from the positive support for the research model investigated, it was possible to present a sensitising framework for the development of the microfoundations of dynamic capability for innovation, thus advancing knowledge in this new and emerging area. (Teece, 2007; Felin and Foss, 2005, 2009; Gavetti, 2005; Abell et al., 2008; Eisenhardt et al., 2010; Felin et al., forthcoming). Microfoundations have become an important emerging theme in building the organisational foundations for competitive advantage because it is increasingly recognised that understanding the explanatory mechanisms which influence individual and collective behaviour at micro-level is critical to building strategic advantage and capability at macro-level (Abell et al., 2008). Microfoundations focus on collective organisational phenomena that require explanation, for example in the dynamic capabilities domain, the development and reconfiguration of constructs such as routines and capabilities. Importantly, recent contributions to this approach acknowledge that such constructs cannot be understood at macro level and need to be analysed at micro level (Gavetti 2005; Felin and Foss, 2005; Helfat and Winter, 2011; Hodgkinson and Healy, 2011; Felin et al., forthcoming).

The study addresses this challenge and offers a framework which outlines the innovation strategies which are associated with innovation outcomes, empowerment-enhancing strategies, relational capital and training. It demonstrates the significant employee innovation behaviours associated with innovation outcomes; generating and developing new ideas through creative problem-solving, giving customer needs priority, taking risks and tolerating failure, responding quickly when changes need to be made and exploring the external environment extensively in searching for new opportunities. The framework also identifies the affective behaviours which support innovation; *knowing,* knowledge sharing and sharing of tacit knowledge (Wenger, 2001; Lam, 2005), *co-working*, helping behaviours (Chadwick and Dabu, 2009), reflexivity and trust (West et al., 2004), *committing*, to increased productivity (Shipton et al., 2006; Takeuchi et al., 2009) and *self-actualising* through embracing challenge, intellectual stimulation and increased workload (Oldham and Cummings, 1996; Ehrnrooth and Bkorkman, 2012). These behaviours build the organisational competencies and capacities which are the microfoundations of dynamic innovation capabilities. They provide the foundation for the sensing, seizing, reconfiguration / management of threats, knowledge management capabilities (Teece, 2007; Lichtenthaler and Lichtenthaler, 2009) which are the higher order strategic capabilities required for innovation and rapid change. They also provide for the internal and external integration which is important in building and maintaining innovation capability (Iansiti and Clark, 1994).

10.4.4 Expansion of National Systems Of Innovation (NSI) Theory

At strategic national level, by elucidating the internal organisational dynamics which support organisational innovation, the study demonstrates its significance in framing national innovation policy. The study expands extant knowledge in national systems of innovation theory and provides unique empirical support for positioning the firm at the centre of innovation policy (Nelson, 1993; Edquist, 1997; Lazonick, 2003; Lundvall, 1998, 2007; Balzat and Hanusch, 2004; Groenwegan and Van der Steen, 2006).

10.5 Methodological Contribution

The key methodological contribution of this research is the analysis and understanding of the role of employees in the areas of microfoundations, dynamic capabilities and organisational-level innovation. Because understanding workers' perceptions and actions is increasingly seen as the key to understanding the link between strategies, practices and performance (Guest, 2011), the study makes a unique methodological contribution as it is

based on a large database of employee responses from the National Workplace Survey of Employees (2009). This is significant for a number of reasons. Firstly, the reactions of employees have been neglected in previous studies exploring the causal link between HR strategies and organisational performance (Wall and Woods, 2005; Macky and Boxall, 2007; Harney, 2009; Guest, 2011). Secondly, analysing data from this very large sample of 5,110 employee responses makes an important contribution to the research already available as much of the criticism of HRM – performance research has been that it relies on small samples (Wall and Woods, 2005) and predominantly privileges management as the preferred survey population. The HRM – performance surveys often require management respondents to merely verify if particular strategies have been introduced or are present in the workplace (Harney, 2009, p. 7). There are also fewer studies on HRM and innovation performance (Laursen and Foss, 2003; Savanevicienne and Stankeviciute, 2010). Thirdly, eliciting the responses of employees and thus measuring innovation climate is an authentic way of ascertaining whether intended HR strategies are having the desired effect on employee perceptions and behaviour (Anderson and West 1998; Purcell and Hutchinson, 2007) and offers a more authentic account of the impact of particular HR strategies on performance as employees are closer to the point of implementation (Guest, 2011).

The study has provided empirical support for dynamic capabilities as an important theoretical framework for the exploration of organisational innovation (Zollo and Winter, 2002; Bowman and Ambrosini, 2003, 2009; Easterby-Smith et al., 2009). This unique empirical investigation exploring the role and responses of employees demonstrates their centrality in the dynamic capabilities framework and the related underlying microfoundations. In movement towards unlocking the innovation black box, the study has provided empirical support for innovation climate as a mediating variable in the relationship between organisational innovation strategies and innovation outcomes, organisational outcomes and proximal employee outcomes (West and Richter, 2007; Takeuchi, 2009; Mossholder, 2011). In the emerging area of microfoundations, this study by integrating literatures and undertaking an investigation based on this integrated approach, provides empirical support for an expanded understanding of microfoundations and their evolution to higher–order capabilities. Finally, the study offers new evidence in the area of National Systems of Innovation (NSI) and provides empirical support for positioning organisational innovation at the centre of the NSI.

10.6 Implications for Practice

The suggested developmental framework outlined in this study can be applied to guide practice and to enable organisations to implement organisational innovation strategies. The framework combines the effects of particular bundles of organisational innovation strategies with strong innovation climate to create the organisational dynamics which are the microfoundations of dynamic capabilities. While it provides an overarching conceptual framework for the development of organisational innovation capabilities, it is sufficiently detailed to enable managers to develop appropriate approaches for implementation. Firstly, the framework outlines the innovation strategies which are associated with innovation outcomes. Secondly it demonstrates how to build a strong innovation climate characterised by employee innovation behaviours such as generating and developing new ideas, problem-solving, giving customer needs priority, taking risks and tolerating failure, responding quickly when changes need to be made and exploring the external environment extensively in searching for new opportunities. Thirdly the framework identifies the elements of an environment which fosters the affective behaviours of innovation as knowing, co-working, committing and self-actualising. Because these behaviours are both internally and externally oriented they demonstrate the key principles for the development of the internal and external integration, sensing, seizing, managing threats and knowledge management capabilities which are the higher order dynamic capabilities of innovation (Iansiti and Clark, 1994; Teece, 2007; Lichtenthaler and Lichtenthaler, 2009)

The analysis and understanding of microfoundations is particularly relevant as microfoundations are more accessible and amenable to direct intervention by management than more abstract higher-order capabilities. The relationships that link the elements of the suggested microfoundations framework together also allow for continuous review and reflexivity in order to protect such capability. Disaggregating the elements of dynamic capability and reconfiguring human resources for innovation in this way, creates a deeper and clearer understanding of the nature and the value of the particular capability that is possessed by the firm. Understanding where the impetus for creativity and innovation has come from and how it can be nurtured enables management to identify the core elements that need to be protected and to uncover latent and underutilised potential capability.

The study also demonstrates that managerial capability in strategic human resource management is critical to building dynamic innovation capabilities. The capability to change, modify and reconfigure the resource base of the firm is fundamental to the

dynamic capabilities theory (Penrose, 1959; Teece et al., 1997; Ambrosini and Bowman, 2009). Expertise in strategic human resource management is therefore required to refresh and reconfigure the human resource base in the organisation to achieve strategic innovation performance. It is also important in the context of this study which is an exploration of innovation in organisational settings or experience-based innovation, the creation of new knowledge through the DUI mode of innovation, doing, using and interacting (Lundvall et al., 2007).

10.7 Research Limitations

Despite its contributions and strong implications, this study is limited in several respects. While the research model supports the association between selected organisational innovation strategies and outcomes and identifies innovation climate as a mediating variable, it is nonetheless not possible to definitively establish causality. Because the study is based on a large cross-sectoral quantitative survey, it cannot establish a causal link between strategies and outcomes conclusively. There may be many potential intervening variables and establishing causality is complicated both in theory and methodology and it is not possible in a study such as this to show conclusively the processes through which associations are made. As is typical in studies in this area, the R^2 leave much unexplained in terms of innovation and prospective mediators (Patterson et al., 1997). Further, building the organisational behavioural systems which support creative behaviours leading to innovation is not linear because the nature of organisations is complex and uncertain and human behaviour is unpredictable. Indeed the resource-based view on which the dynamic capabilities theory is founded, views the organisation's employment system as a complex social structure (Becker and Gerhart, 1996). In this regard, while large quantitative surveys provide an important foundation in investigating correlations and relationships, these alone cannot definitively provide the answers or the explanation of underlying causal connections and mechanisms. Providing explanations to complex questions of causality ideally requires multiple sources of data. In this context, quantitative data would benefit from support by qualitative research. This might include in-depth longitudinal studies and qualitative methodologies such as specific in-depth cases studies and interviews with key actors, in order to provide richer causal explanations that reflect particular settings and surrounding contextual factors and influences. Indeed, even within the quantitative domain there is great scope to build on the foundation provided by the current research by further

distinguishing between types of innovation, innovation in various sections and examining the impact of environmental dynamism.

10.8 Future Research Avenues

This investigation opens up many opportunities for further research. Firstly, the study of microfoundations is a new and emerging area and it offers many opportunities for future research and development. Since the emergence of the resource-based–view (RBV) (Wernerfelt, 1984, 1994: Barney, 1991), organisational capabilities theory (Nelson and Winter, 1982; Chandler, 1992) and the dynamic capabilities framework (Teece et al., 1994, 1997) throughout the 1980's and early 1990's, almost two decades of work in seeking to understand the underpinning routines and resource configurations of such capabilities have yielded little return and several black boxes remain (Felin et al., forthcoming). This study opens up new avenues for investigation and demonstrates that these underlying constructs remain ripe for further analysis and investigation.

Secondly, aligning the domains of dynamic capabilities and human resource management offers new avenues for research which have potential benefits for both domains. Areas of enquiry can be pursued along two developmental pathways. Research can be undertaken on how knowledge in the human resource management domain can contribute to the development of dynamic capabilities in areas other than innovation, for example in project management, in international marketing, in mergers and acquisitions, and in building strategic alliances in emerging markets. Equally, the dynamic capabilities framework provides an important strategic focus for human resource management research which will further strengthen efforts to establish its strategic position in building innovation capability and competitive advantage. Linking human resource management strategically with dynamic capabilities will also strengthen the organisational value of the human resource function among senior and line managers, an aspiration that continues to create challenges (Guthrie et al., 2011). Using dynamic capabilities as the research focus can help provide answers to critical and emerging questions in the HR field, questions such as the real size and nature of the HR impact (Guest, 2011) and the role of critical actors in the development and implementation of the links in the microfoundations-dynamic capabilities value chain (Thompson, 2007).

Thirdly, future studies in this area might also explore the links between dynamic capabilities and other elements of high performance work systems (HPWS) which include areas such as how recruitment, selection, promotion, reward systems, and involvement structures such as quality circles can help build dynamic capabilities in differing strategic contexts. Finally, while this study investigated the mediation effects of innovation climate in the strategies-innovation performance link, future research is required to explore the impact of other mediating variables in understanding the dynamics of creativity and innovation in organisational settings.

Noting the complexity of organisational systems and noting in particular that building capability in social contexts is not linear, the microfoundations framework which has been developed from this investigation offers a developmental approach to building dynamic capabilities for innovation in organisations. It outlines an architecture that can be deployed which nurtures the emotional, cognitive, learning and social environment from which creativity and innovation are likely to emerge. This is particularly important in the context of innovation because contextual factors are as important as individual characteristics and traits in explaining employee creative behaviour (Ford 1996; Mumford, 2000; Rice 2005; Takeuchi et al., 2009; Mossholder et al., 2011).

By demonstrating that the internal organisational dynamics of firms and organisations matter significantly to innovation performance and conceptualising firms at the core of the national system of innovation (NSI) (Lundvall,1998, 2007; Lazonick,2003; Balzat and Hanusch, 2004) future studies in this domain will further the positioning of organisational innovation prominently in national innovation policy.

References

Abell, P. and Felin, T. and Foss, N. (2008). Building microfoundations for routines, capabilities and performance Links, *Managerial and Decision Economics*, 29, pp. 489-502.

Altenburg, T., Schmitz, H. and Stamm, A. (2007). Breakthrough? China's and India's transition from production to innovation, *World Development,* Elsever Ltd.

Ambrosini, V. and Bowman, C. (2009). What are dynamic capabilities and are they a useful construct in strategic management? *International Journal of Management Reviews* 11(1), pp. 29-49.

Ambrosini, V., Bowman, C. and Collier, N. (2009). Dynamic capabilities: An exploration of how firms renew their resource base, *British Journal of Management,* 20, S9-S24.

Amabile, T.M. (1993). Motivational synergy: Towards new conceptualisations of intrinsic and extrinsic motivation in the workplace, *Human Resource Management Review*. 3(3), pp 185-201.

Amabile, T.M., Conti, H., Lazenby, J. and Herron, M. (1996). Assessing the work environment for creativity. *Academy of Management Journal*, 39, pp. 1154-1184.

Anderson, N.R. and West, M.A. (1998). Measuring climate for work innovation: development and validation of the team climate inventory, *Journal of Organisational Behaviour,* 19, pp. 235 – 258.

Appelbaum, E., Bailey, R., Berg, P. and Kallebery, A. (2000). *Manufacturing Advantage: Why High Performance Work Systems Pay Off*, Ithaca New York: Cornell University Press.

Arend, R.J. and Bromiley, P. (2009). Assessing the dynamic capabilities view: Spare change everyone? *Strategic Organisation,* 7(1): pp. 75-90.

Armbruster, H., Bikfalvi, A., Kinkel, S. and Lay, G. (2008). Organisational innovation: The challenge of measuring non-technical innovation in large-scale surveys, *Technovation,* 28, pp. 644-657.

Argote, L., McEvily, B. and Reagans, R. (2003). Managing knowledge in organisations: An integrative framework and review of emerging themes, *Management Science*, 49(4) pp. 571-582.

Ashby, F,G., Isen, A.M. and Turken, A.U. (1999). A neuropsychological theory of positive affect and its influence on cognition, *Psychological Review*, 106(3), pp. 529- 550.

Ashkanasy, N. and Ashton-James, C. (2007). Positive emotion in organisations: A multi-level framework, Chapter 5 in *Positive Organisational Behaviour* , by Nelson, D., and Cooper, C., (ed.), Sage Publications, 2007.

Ashkanasy, N. and Daus, C. (2002). Emotion in the workplace: the new challenge for managers, *Academy of Management Executive*, 2002, 26(1), pp. 76-86.

Augier, M. and Teece, D.J. (2006). Understanding complex organisation: The role of know-how, internal structure, and human behaviour in the evolution of capabilities, *Industrial and Corporate Change*, 15(2), pp. 395–416.

Augier, M. and Teece, D.J. (2008). Strategy as evolution with design: The foundations of dynamic capabilities and the role of managers in the economic system, *Organization Studies, 29:* pp. 1187-1208.

Balzat, M. and Hanusch, H. (2004). Recent trends in the research on national innovation systems, *Journal of Evolutionary Economics,* 14, pp. 197-210.

Barney, J. (1991). Firm resources and sustained competitive advantage, *Journal of Management*, 17(1), pp. 99-120.

Baron, R. and Kenny, D. (1986). Moderator-mediator variables distinction in social psychological research: Strategic and statistical considerations, *Journal of Personality and Social Psychology*, 51(6), pp. 1173-1182.

Barsade, S.G. (2002). The ripple effect: Emotional contagion and its influence on group behaviour, *Administrative Science Quarterly*, 47, pp. 644-675.

Barreto, I. (2010). Dynamic capabilities: A review of past research and an agenda for the future, *Journal of Management*, 36(1), pp. 256-280.

Batt, R. (2004). Who benefits from teams? Comparing the outcomes for managers, supervisors, and workers", *Industrial Relations*, 43(1) pp. 183-212.

Becker, B. and Gerhart, B. (1996). The impact of human resource management on organisational performance; progress and prospects, *Academy of Management Journal,* 39(4), pp. 779-801.

Becker, M.C. (2004). Organisational routines: A review of the literature, *Industrial and Corporate Change,* 13(4), pp. 643 – 677.

Benton, T. and Craig. I. (2001). *Philosophy of Social Science: The philosophical Foundations of Social Thought,* Palgrave: Great Britain.

Bessant, J. (2007). Opening up strategic space through discontinuous innovation. in Galavan, *Strategy, Innovation and Change,* Chapter 10.

Best, M.H. (1990). *The New Competition: Institutions of Industrial Restructuring,* Polity Press: Cambridge.

Best, M.H. and Forrant, R. (2000). Regional industrial modernization programmes: Two cases from Massachusetts, *European Planning Studies*, 8(2), pp. 211-222.

Biron, M. and Bamberger, P. (2011). More than lip service: Linking the intensity of empowerment initiatives to individual wellbeing and performance, *The International Journal of Human Resource Management*, 22(2), pp. 258-278.

Black S. and Lynch L.M. (2001). How to compete: the impact of workplace practices and information technology on productivity, *Review of Economics and Statistics*, 83(3), pp. 434-445.

Black, S., Lynch, L. and Krivelyova, A. (2004). How workers fare when employers innovate, *Industrial Relations*, 43(1), pp. 44-66.

Black, S.E. and Lynch, L.M. (2004). What's driving the new economy? The benefits of workplace innovation, *Economic Journal*, 114, pp. 97-116.

Blau, P. (1964). *Exchange and Power in Social Life*, New York: Wiley

Boselie, P., Dietz, G. and Boon, C. (2005). Commonalities and contradictions in HRM and performance research, *Human Resource Managment Journal*, 15(3), pp. 67-94.

Boud, D., Cressey, P. and Doherty, P. (2006). *Productive Reflection at Work. Learning for Changing Organisations,* Routledge Taylor and Francis Group: London and New York.

Bowen, D. and Ostroff, C. (2004). Understanding HRM - firm performance linkages: the role of the 'strength of the HRM system', *Academy of Management Review*, 29(2), pp. 203-221.

Bowman, C. and Ambrosini, V. (2003). How the resource-based and the dynamic capability views of the firm inform corporate-level strategy. *British Journal of Management*, 14, pp. 289-303.

Boxall, P. and Purcell, J. (2003). *Strategy and Human Resource Management*. New York: Palgrave Macmillan.

Brown, S.P. and Leigh, T.W. (1996). A new look at psychological climate and its relationship to job involvement, effort and performance. *Journal of Applied Psychology*, 81, pp. 358-368.

Bruch, H. and Ghoshal, S. (2003). Unleashing organisational energy, *MIT Sloan Management Review,* Fall, pp. 45-51.

Brynjolfsson E. and Hitt L. (2000) Beyond computation: Information technology, organizational transformation and business performance, *Journal of Economic Perspectives*, 14(4), pp. 23-48.

Burrell, G. and Morgan, G. (1979). *Social Paradigms and Organisational Analysis: Elements of Sociology of Corporate Life*, Heineman: London.

Campbell, H. (2002). Evidence-based policy: The continuing search for effective policy processes, *Planning Theory and Practice*, 3(1), pp. 89-90.

Campbell, J.P., Dunnette, M.D., Lawler, E.E. and Weick, K.E. (1970). *Managerial Behaviour, Performance, and Effectiveness,* New York: McGraw Hill.

Camann, C., Fichman, M., Jenkins, G.D. Jr. and Klesh, J.R. (1983). Assessing the attitudes and perceptions of organisational members. In S. E. Seashore, I. E.E. Lawler, P.H. Mirvis, and C. Cammonn (Eds.). *Assessing organisational change: a guide to methods, measures and practices:* 71-138. New York: Wiley.

Cappelli P. and Neumark D. (2001). Do "high performance" work practices improve establishment-level outcomes?, *Industrial and Labour Relations Review*, 54(4), pp. 737-775.

Caroli, E. and Reenen, J.V. (2001). Organization, skills and technology: evidence from a panel of British and French establishments, *Quarterly Journal of Economics*, 116, pp. 1449-1492.

Cepeda, G. and Vera, D. (2007). Dynamic capabilities and operation capabilities: A knowledge management perspective, *Journal of Business Research,* 60, pp. 426-437.

Casey, D. and Brugha, C.M. (2005). Questioning cultural orthodoxy: Policy implications for Ireland as an innovative knowledge-based economy, *E: CO* Issue, 7(1), pp. 43 – 59.

Cash, J.I., Earl, M.J. and Morison, R. (2008). Teaming up to crack innovation, enterprise, integration, *Harvard Business Review,* November, pp. 91-100.

Cavagnou, D. (2011). A conceptual framework for innovation: An application to human resource management policies in Australia, *Innovation: Management, Policy and Practice,* 13, pp. 111-125.

Chadwick, C. and Dabu, A. (2009). Human resources, human resource management and the competitive advantage of firms: Towards a more comprehensive model of causal linkages, *Organisation Science*, 20(1), pp. 253–272.

Chandler, A.D. (1990). *Scale and Scope: The Dynamics of Industrial Capitalism*, Cambridge, MA Belknap Press: Harvard University Press.

Chandler, A. (1992). Organisational capabilities and the economic history of the industrial enterprise, *Journal of Economic Perspectives*, 6(3), pp. 79-100.

Chang, Y.C. and Chen, M.H. (2004). Comparing approaches to systems of innovation: The knowledge perspective, *Technology in Society,* 26. pp. 17-37.

Choong, Y.O., Wong, K.L. and Lau, T.C. (2012). Organisational commitment: An empirical investigation of the academician of Malaysian private universities, *Business and Economic Research Journal,* 3(2), pp. 51-64.

Claxton, G. (1998). Investigating human intuition: Knowing without knowing why, *The Psychologist,* May, pp. 217-220.

Coase, R.H. (1960). The problem of economic cost, *Journal of Law and Economics*, 17(2), pp. 357-376.

Combs, J., Hall, A. and Ketchen, D. (2006). How much do high-performance work practices matter? A meta-analysis of their effects on organisational performance, *Personnel Psychology*, 59, pp. 501-528.

Conway, E. and McMackin, J. (1997). Developing a culture for innovation: What is the role of the HR System? *DCUBS Research Paper Series*, 32, pp. 1-21.

Coleman, J.S. (1990). *Foundations of Social Theory,* The Belknap Press of Harvard University Press: Cambridge, MA/London.

Cook, J., Hepworth, S, Wall, T and Warr, P. (1981). *The Experience of Work: A Compendium of 249 Measures and their Use,* London: Academic Press.

Cross, R., Baker, W. and Parker, A. (2003). What creates energy in organisations? *MIT Sloan Management Review,* Rev 44, 4, pp. 51-58.

Csikszentmihalyi, M. (1990). The domain of creativity. In M.A. Runco and R. S. Albert (Eds.), *Theories of Creativity* pp. 190-212. Newbury Park, CA: Sage

Csikszentmihalyi, M. (1990). *Flow: The Psychology of Optimal Experience,* Harper and Row: New York.

Cyert, R.M. and March J.G. (1963/1992). *A Behavioural Theory of the Firm,* 2nd ed, Prentice Hall, Englewood Cliffs: NJ.

Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators, *Academy of Management Journal*, 34(3), pp. 555–590.

Danford, A., Richardson, M. and Upchurch, M. (2005). *New Unions, New Workplaces: A Study of Union Resilience in the Restructured Workplace*, London: Routledge.

Dawson, J.F., Gonzalez-Romá, V., Davis, A. and West, M.A. (2008). Organisational climate and climate strength in UK hospitals, *European Journal of Work and Organisational Psychology.* 17, pp. 89-111.

Dosi, G. (1988). Sources, procedures and microeconomic effects of innovation, *Journal of Economic Literature,* 36. pp. 1126-1171.

Dosi, G., Nelson, R.R. and Winter, S.G. (Ed.). (2000). *The Nature and Dynamics of Organisational Capabilities,* Oxford/New York. Oxford University Press.

Dosi, G., Faillo, M. and Marengo, L. (2009). Organisational capabilities, patterns of knowledge accumulation, and governance structures in business firms: an introduction. *Organisation Studies*, 29, pp. 1165- 1185.

Drexler, J. (1979). Organisational climate: Its homogeneity within organisations. *Journal of Applied Psychology*, 62, pp. 38-42.

Easterby-Smith, M., Lyles, M.A. and Peteraf, M.A. (2009). Dynamic capabilities: Current debates and future directions, *British Journal of Management,* 20, sI-s8.

Edmundson, A.C. (1999). Psychological safety and learning behaviour in work teams, *Administrative Science Quarterly,* 44, pp. 350-383.

Edquist, C. (Editor) (1997). *Systems of Innovation: Technologies, Institutions and Organisations*, Pinter: London.

Edquist, C. and Hommen, L. (1999). Systems of innovation: Theory and policy for the demand side, *Technology in Society,* 21, pp. 23-79.

Ehrhardt, K., Millar, J. and Freeman, S. (2011). An examination of the relationship between training comprehensiveness and organisational commitment: Further exploration of training perceptions and employee attitudes, *Human Resource Development Quarterly,* 22(2), pp. 459-488.

Ehrnrooth, M. and Bjorkman, I. (2012). An integrative HRM process theorization: Beyond signalling effects and mutual gains, *Journal of Managment Studies,* pp. 1467 – 6486.

Eisenhardt, K.M. and Martin, J.A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, 21, pp. 1105-1121.

Eisenhardt, K.M., Furr, N.R. and Bingham, C.B. (2010). Microfoundations of performance: Balancing efficiency and flexibility in dynamic environments, *Organisation Science,* 21(6), pp. 1263-1273.

Ekvall, G. (1996). Organisational climate for creativity, *European Journal of Work and Organisational Psychology,* 5 (1), pp. 105-123.

Ekvall, G. (1997). Organisational conditions and levels of creativity, *Creativity and Innovation Management*, 6(4), Blackwell Publishing Ltd.

Ekvall, G. and Ryhammer, L. (1999). The creative climate: its determinants and effects at a Swedish University, *Creativity Research Journal*, 12, pp. 303-310.

Evans, W.R. and Davis, W.D. (2005). High Performance work systems and organisational performance: The mediating role of internal social structure, *Journal of Management*, 31, pp. 758-775.

Fearful, A. (2005). Using interpretive sociology to explore workplace skill and knowledge, *International Journal of Social Research Methodology,* 8(2), pp. 137-150.

Felin, T. and Foss, N.J. (2005). Strategic organisation: A field in search of micro-foundations, *Strategic Organisation*, 3(4), pp. 441-455.

Felin, T. and Foss, N.J. (2009). Organisational routines and capabilities: historical drift and a course-correction toward microfoundations, *Scandinavian Journal of Management*, 25(2), pp. 157-167.

Felin, T., Foss, N., Heimeriks, K. and Madsen, T. (Forthcoming). Microfoundations of routines and capabilities: Individuals, processes and structure, *Journal of Management Studies,* 'Accepted Article', doi: 10.1111/j.1467-6486.2012.01052.x.

Ford, C.M. (1996). A theory of individual creative action in multiple social domains, *Academy of Management Review*, 21(4), pp. 1112-1142.

Ford, C.M. and Gioia, D.A. (1995). *Creativity in organisations: Ivory tower visions and real world voices*, Newbury Park, CA: Sage.

Freeman, C. (1995). The 'National System of Innovation' in historical perspective, *Cambridge Journal of Economics,* 19: pp. 5-24.

Freeman, C. (2001). A hard landing for the 'new economy'? information technology and the United States national system of innovation, *Structural Change and Economic Dynamics,* 12, pp. 115-139.

Freeman, C. (2002). Continental, national and sub-national innovation systems – complementarity and economic growth, *Research Policy,* 31, pp. 191-211.

Freeman, R. and Kleiner, M. (2000). Who benefits from employee involvement: Firms or workers? *American Economic Review*, 90(2), pp. 219-23.

Freeman, R. and Kleiner, M. (2007). Adoption and termination of employee involvement programmes. *National Bureau of Economic Research Working Paper Series.* Cambridge: MA.

Gavetti, G. (2005). Cognition and hierarchy: Rethinking the microfoundations of capabilities' development, *Organisation Science*, 16(6), pp. 599-617.

Gavin, J.R. and Howe, J.G. (1975). Psychological climate: Some theoretical and empirical considerations, *Behavioural Science* , 20, pp. 28-240.

Geary, J. and Trif, A. (2011). Workplace partnership and the balance of advantage: A critical case analysis, *British Journal of Industrial Relations*, 49, pp. 44-69.

George, J.M. (1996). Group affective tone. In M.A. West (Ed.), *Handbook of work group psychology* (pp. 777-94). Chichester, England: John Wiley.

George, J.M. and Brief, A.P. (1992). Feeling good-doing good: A conceptual analysis of mood at work - organisational spontaneity relationship, *Psychological Bulletin*, 112, pp. 310-329.

Gourlay, S. and Nurse, A. (2005). Flaws in the engine of knowledge creation: A critique of Nonaka's theory. Chapter 13. pp. 293-315, in *Challenging the Issues in Knowledge Management* edited by Anthony. F. Buono and Fleming Pondfelt. *A Volume in Research and Management Consultancy* V. 5.

Grant, R.M. (1996). Toward a knowledge-based theory of the firm, *Strategic Management Journal,* 13, pp. 135-144.

Green, R. (2009). Innovation the key to recovery, *The Australian, 1st April 2009.*

Groenewegen, J. and Van der Steen, M. (2006). The evolution of national innovation systems, *Journal of Economic Issues*, xl(2), pp. 277-285.

Guthrie, J.P., Flood, P.C., Liu, W. and MacCurtain, S. (2009) High performance work systems in Ireland: Human resource and organizational outcomes, *The International Journal of Human Resource Management,* 20(1), pp. 112-125.

Guest, D. (1997). Human resource management and performance review and research agenda, *International Journal of Human Resource Management*, 8,(3), pp. 263-76.

Guest, David. (2001). Human resource management: when research confronts theory. *International Journal of Human Resource Management.* Vol 12, Issue 7, pp. 1092-1106.

Guest, D. (2011). Human resource management and performance: Still searching for some answers, *Human Resource Management Journal*, 21(1). pp. 3-13.

Guthrie, J.P., Flood, P.C., Liu, W., MacCurtain, S. and Armstrong, C. (2011). Big hat, no cattle? The relationship between use of high-performance work systems and managerial perception of HR departments, *The International Journal of Human Resource Management.* 22(8), pp. 1672-1685.

Hage, J.T. (1999). Organizational innovation and organizational change. *Annual Review of Sociology,* 25, pp. 597-622.

Hamil, G., Berkinshaw, J. and Mol, M. (2008) Management innovation, *Academy of Management Review*, 33(4), pp. 825-845.

Hamil, G. (2007) Management Innovation. *Leadership Excellence,* Jan 2007, vol 24 Issue 1.

Harney, B. (2009). Exploring the road less travelled in HRM-performance research: A critical realist alternative to 'Big Science'. *University Council of Industrial Relations and Human Resource Programs (UCIRHRP) Student Paper Presentation.*

Heffernan, M., Harney, B., Cafferkey, K. and Dundon, T. (2009). Exploring the relationship between HRM, creativity and organisational performance: Evidence from Ireland. Paper presented at the 2009 American Academy of Management Conference: Chicago.

Helfat, C.E., Finkelstein, S., Mitchell, Will., Peteraf., M.A., Singh, H., Teece, D.J. and Winter, S.G. (2007). *Dynamic Capabilities: Understanding Strategic Change in Organisations,* Blackwell Publishing.

Helfat, C.E. and Peteraf, M.A. (2009). Understanding dynamic capabilities: Progress along a developmental path, *Strategic Organization,* 7(1), pp. 91-102.

Helfat, C.E. and Winter, S.G. (2011). Untangling dynamic and operational capabilities: Strategy for the (n)ever–changing world, *Strategic Management Journal,* 32, pp. 1243-1250.

Hesketh, A. and Fleetwood, S. (2006). Beyond measuring the human resources management – organisational performance link: Applying critical realist meta-theory, *Organisation Articles Sage Publications,* 13(5), pp. 677- 699.

Hesketh, A. and Fleetwood, S (2006). HRM – Performance research: Under-theorized and lacking explanatory power, *International Journal of Human Resource Management*. December, 2006. 17:12, pp. 1977-1993.

Hewitt-Dundas, N. and Roper, S. (2008). Ireland's innovation performance: 1991 to 2005, *Quarterly Economic Commentary*, Summer 2008, pp. 46-68.

Hewitt-Dundas, N. and Roper, S. (2010). Output additionality of public support for innovation: Evidence for Irish manufacturing plants, *European Planning Studies*, 18(1), pp.107-122.

Hilliard, R. and Green, R. (2005). Governance and institutional change in Ireland. In OECD (2005) *Governance of Innovation Systems:* Volume 2: Case Studies in Innovation Policy.

Hodgson, G.M. (Forthcoming, 2012). The mirage of microfoundations, *Journal of Management Studies,* 'Accepted article', doi: 10.1111/j.1467-6486. 2012.01079.x

Hodgkinson, G.P. and Healey, M.P. (2011). Psychological foundations of dynamic capabilities: Reflexion and reflection in strategic management, *Strategic Management Journal*, 32, pp. 1500-1516.

Hoskisson, R., Hitt, M. and Wan, M. (1999). Theory and research in strategic management: Swings of a pendulum, *Journal of Management,* 25(3), pp. 417-456.

Howell, J. (2005) The right stuff: Identifying and developing effective champions of innovation, *Academy of Management Executive*, 19(2), pp. 108-119.

Hunter, S.T., Bedell, K.E. and Mumford, M.D. (2007). Climate for creativity: A quantitative review, *Creativity Research Journal,* 19(1), pp. 69-90.

Hunter, S.T., Bedell, K.E. and Mumford, M.D. (2007). Dimensions of creative climate: A general taxonomy, *Korean Journal of Thinking and Problem Solving*, 15, pp. 97-116.

Iansiti, M. and Clark, K.B. (1994). Integration and dynamic capability: Evidence from product development in automobiles and mainframe computers, *Industrial and Corporate Change;* 3(3), pp. 557 – 605.

Ichniowski C., Shaw K. and Prennushi G. (1997). The effects of human resource management practices on productivity: a case study of a steel finishing line, *American Economic Review*, 87(3), pp. 291-313.

Isaksen, S., Lauer, K. and Ekvall, G. (1998). Perceptions of the best and worst climates for creativity: Preliminary validation evidence for the situational outlook questionnaire, *Creative Problem Solving Group – Buffalo.*

Innovation Ireland (2010) *Report of the Innovation Taskforce,* Government Publications, Published by the Stationery Office, Dublin.

Isen, A.M. (2003). 'Positive affect, systematic cognitive processing, and behaviour: Toward integration of affect, cognition, and motivation', in F. Dansereau and F.J. Yammarino (eds) *Research in Multi-level Isssues, Vol. 2: Mutli-level Issues in Organisational Behaviour and Strategy* (pp. 55-72). Oxford: Elsevier Science.

Ismail, A., Mohamad, H.A., Sulaiman, A.Z., Mohamad, M.H. and Yusuf, M.H. (2011). An empirical study of the relationship between transformational leadership, empowerment and organisational commitment, *Business and Economic Journal*, 2(1), pp. 1309-2448.

Jakubik, M. (2011). Becoming to know: Shifting the knowledge creation paradigm, *Journal of Knowledge Management.* 15(3), pp. 374-402.

James, L.A. and James, L.R. (1989). Integrating work environment perceptions: Explorations into the measurement of meaning, *Journal of Applied Psychology*, 74, pp. 739-751.

Jenson, M.B., Johnson, B., Lorenz, E. and Lundvall, B.A. (2007). Forms of knowledge and modes of innovation, *Research Policy*, 36, pp. 680-693.

Jordan, D. and O'Leary, E. (2007). Is Irish innovation policy working? Evidence from Irish high-technology businesses. Paper presented to the Statistical Inquiry Society of Ireland in Dublin. October 2007. Statistical Inquiry Society of Ireland: Dublin

Kafouros, M., Buckley, P., Sharp, J. and Wang, C. (2008). The role of internationalisation in explaining innovation performance, *Technovation,* 18(1-2), pp. 63-74.

Katkalo, V.S., Pitelis, C.N. and Teece, D.J. (2010). Introduction: On the nature and scope of dynamic capabilities, *Industrial and Corporate Change,* 19(4), pp. 1175-1186.

Karesek, R.A. (1979). Job demands, job decisions, latitude and mental strain: Implications for job redesign, *Administrative Science Quarterly,* 24(June), pp. 285-305.

Karesek, R.A. and Tores, T. (1990). *Healthy Work: Stress, Productivity and the Reconstruction of Working Life*, Basic Books: New York.

King, B.K., Chermont, K., West, M., Dawson, J.F. and Hebl, M.R. (2007). How innovation can alleviate negative consequences of demanding work contexts: The influence of climate for innovation on organisational outcomes, *Journal of Occupational and Organisational Psychology,* 80, pp. 631-635.

Kogut, B. and Zander, U. (1992). Knowledge of the firm, combinative capabilities and the replication of technology, *Organization Science,* 3(3), pp. 383-397.

Kogut, B. and Zander, U. (1995). Knowledge and the speed of the transfer and imitation of organisational capabilities: An empirical test, *Organisation Science*, 6(1), pp. 76-92.

Kontoghiorghes, C., Awbrey, S.M. and Feurig, P.L. (2005). Examining the relationship between learning organisation characteristics and change adaptation, innovation and organisational performance, *Human Resource Development Quarterly*, 16(2), pp. 185-211.

Kraaijenbrink, J., Spender, J.C. and Groen, A.J. (2010). The resource-based view: A review and assessment of its critiques, *Journal of Management*, 36(1), pp. 349-372.

Kraatz, M.S. and Zajac, E.J. (2001). How organisational resources affect strategic change and performance in turbulent environments: Theory and evidence, *Organisation Science,* 12: pp. 632-657.

Laamanen, T. and Wallin, J. (2009). Cognitive dynamics of capability development paths, *Journal of Management Studies*, 46(6), pp. 950-981.

Lam, A. (2000). Tacit knowledge, organizational learning and societal institutions: An integrated framework, *Organization Studies*, 21(3), pp. 487-513.

Lam, A. (2005). Organisational innovation. Chapter 5. *The Oxford Handbook of Innovation.* Edited by Fagerberg, J,. Mowery, D., and Nelson, R. Oxford University Press, New York. 2005.

Lansisalmi, H. and Kivimaki, M. (1999). Factors associated with innovative climate: What is the role of stress, *Stress Medicine,* 15, pp. 203-213.

Laursen, K. and Foss, N.J. (2003) New human resource management practices, complementarities and the impact on innovation performance, *Cambridge Journal of Economics,* 27, pp. 243-263.

Lawler, E.E., Hall, D.T. and Oldham, G.R. (1974). Organisational climate: Relationship to organisational structure, process and performance, *Organisational Behaviour and Performance*, 11, pp. 139-155.

Lawson, B. and Samson, D. (2001). Developing innovation capability in organisations: A dynamic capabilities approach, *International Journal of Innovation Management*, 5(3), pp. 377-400.

Lazonick, W. and O'Sullivan M. (1995). Organisation, finance and international competition, *Industrial and Corporate Change,* 5(1), pp. 1-49.

Lazonick, W. (2003). The theory of the market economy and the social foundations of the innovative enterprise, *Economic and Industrial Democracy,* 24, pp. 9-44.

Lazonick, W. and Prencipe A. (2005). Dynamic capabilities and sustained innovation: Strategic control and financial commitment at Rolls-Royce plc., *Industrial and Corporate Change* ,13(3), pp. 501-542.

Lazonick, W. (2008). Comment on "Technological revolutions and the evolution of industrial structures" (by Dosi, G., Gambardella, A., Grazzi, M. and Orsenigo, L.), *Capitalism and Society,* 3(1) pp. 1-21.

Leavy, B. and Jacobson, D. (1997). Innovation – the case for multi-level research, *DCUBS Research Paper Series 1997-1998,* No 30.

Leonard-Barton, D. (1992). Core capabilities and core rigidities: A paradox in managing new product development. *Strategic Management Journal*, 13, pp. 111-125.

Liao, S., Fei, W. and Liu, C. (2008). Relationships between knowledge inertia, organizational learning and organizational innovation. *Technovation,* Vol. 28. Issue 4, pp. 183-195.

Lichtenthaler, U. and Lichtenthaler E. (2009). A capability – based framework for open innovation: Absorptive capacity, *Journal of Management Studies*, 46(8), pp. 1315-1330.

Lin, GTR., Chang, YH. and Shen, YC. (2010). Innovation policy analysis and learning: Comparing Ireland and Taiwan, *Entrepreneurship and Regional Development,* 22(7-8), pp. 731-762.

Lorenz, E. and Valeryre, A. (2005) Organisational innovation, human resource management and labour market structure: A comparison of the EU-15, *Journal of Industrial Relations*, 47(4), pp. 424-442.

Lorenz, E. and Lundvall, B.A. (2010). Measuring creative work: The European experience, *Journal of Knowledge Management*, 8(January), pp. 77-79.

Lundvall, B.A. (1998). Why study national systems and national styles of innovation?, *Technology Analysis and Strategic Management,* 10(4), pp. 407-421.

Lundvall, B.A. and Johnson, B. (1994). The learning economy, *Journal of Industrial Studies*, 1(2), pp. 23-42.

Lundvall, B.A. (2007) National innovation systems – analytical concept and development tool, *Industry and Innovation,* 14(1), pp. 95-119.

Lynch, L.M. (2007). The adoption and diffusion of organizational innovation: Evidence for the US economy. NBER Working Paper 13156. *National Bureau of Economic Research*: Cambridge MA.

McAdam, R. (2000). Knowledge management as a catalyst for innovation within organisations: A qualitative study, *Knowledge and Process Management,* 7(4), pp. 233-241.

McAdam, R. and McCreedy, S. (2000). A critique of knowledge management: Using a social constructionist model, *New Technology, Work and Employment,* 15(2), pp. 155-168.

McAdam, R. and McClelland, J. (2002). Individual and team-based idea generation within management: organisational and research agendas, *European Journal of Innovation Management*, 5(2), pp. 86-97.

McAdam, R. and Keogh, W. (2004). Transitioning towards creativity and innovation measurement in SME's, *Creativity and Innovation Management,* 13(2), pp. 126-139.

McLeod, D. and Clarke, N. (2009). Engaging for success: Enhancing performance through employee engagement. Report to Government. Commissioned by the UK Department of Business, Innovation and Skills.

MacCurtain, S., Flood, P., Ramamoorthy, N., West, M.A. and Dawson, J. (2010). Management team knowledge sharing and new product performance: A study of the Irish software industry, *Creativity and Innovation Management*, 19(3), pp. 219-230.

MacDuffie, J.P. (1995). Human resource bundles and manufacturing performance: Organisational logic and flexible production systems in the world auto industry, *Industrial and Labour Relations Review*, 48(2), pp. 197-221.

Macky, K. and Boxall, P. (2007). The relationship between 'high-performance work practices' and employee attitudes: An investigation of additive and interaction effects, *International Journal of Human Resource Management*, 18(April), pp. 537-567.

March, J. and Simon, H. (1958). *Organisations*, Wiley.

Meyer, J. P. and Allen, N.J. (1997). *Commitment in the Workplace: Theory, Research and Application*, Thousand Oaks, CA: Sage Publications.

Morgan, G. (2006). *Images of Organizations.* Thousand Oaks, CA: Sage.

Mossholder, K.W., Richardson, H. and Settoon, R. (2011). Human resource systems and helping in organisations: A relational perspective, *Academy of Management Review,* 35(1), pp. 33-52.

Moyday, R.T., Steers, R.M., and Porter, L.W. (1979). The measurement of organisational commitment, *Journal of Vocational Behaviour,* 14, pp. 224-247.

Mumford, M.D. (2000). Managing creative people: Strategies and tactics for innovation, *Human Resource Management Review*, 10, pp. 313-351.

Murphy, M. (2002). Organisational change and firm performance. STI Working Paper 2002/2014, OECD: Paris.

National Workplace Surveys. (2009). *The Changing Workplace: A Survey of Employees' Views and Experiences,* National Centre for Partnership and Performance (NCPP).

Neal, A., West, M.A. and Patterson, M.G. (2005). Do organisational climate and competitive strategy moderate the relationship between human resource management and productivity? *Journal of Management*, 31(4), pp. 492-512.

Neal, A. and Griffin, M.A. (1999). Developing a theory of performance for human resource management, *Asia Pacific Journal of Human Resources*, 37, pp. 44-59.

Nelson, R. (1991). Why do firms differ, and how does it matter? *Strategic Management Journal*, 12, pp. 61-74.

Nelson, R. and Rosenberg, N. (1993). Introduction in Nelson R. editor. *National innovation systems; a comparative analysis.* Oxford: Oxford University Press.

Nelson, R.R. and Winter, S.G. (1982). *An Evolutionary Theory o Economic Change*, Harvard University Press: Cambridge MA.

Netemeyer. R.G., Boles, J.S. and McMurrian, R. (1996). Development and validation of work family and family-work conflict scales, *Journal of Applied Psychology*, 81, pp. 400-410.

Nonaka, I. (1994). A dynamic theory of organisational knowledge creation, *Organisation Science*, 5(1), pp. 14-37.

Nonaka, I. and Takeuchi, K. (1995). *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation,* Oxford University Press: Oxford.

O'Connor Colarelli, G. (2008). Major innovation as a dynamic capability: A systems approach, *Journal of Product Innovation Management,* 25, pp. 313-330.

OECD (2005). Oslo Manual, 3rd edition, DSTI, OECD: Paris.

O'Gorman, C. and Kautonen, M. (2004). Policies to promote new knowledge-intensive industrial agglomerations, *Entrepreneurship and Regional Development*., (November), pp. 459-479.

Oldham, G.R. and Cummings, A. (1996). Employee creativity: Personal and contextual factors at work, *Academy of Management Journal*, 39(3), pp. 607-634.

O'Riain, S. (2000). The flexible developmental state: Globalization, information technology and the "Celtic Tiger", *Politics and Society,* 28(2), pp. 157-193.

O'Riain, S. (2004). State, competition and industrial change in Ireland 1991-1999, *The Economic and Social Review,* 35(1), pp. 27-53.

O'Sullivan, M. (2000). *Contests for Corporate Control: Corporate Governance and Economic Performance in the United States and Germany,* OUP: Oxford.

Patterson, M., West, M., Lawthom, R. and Nickell, S. (1997). Impact of people management practices on business performance, *Institute of Personnel and Development*, London.

Patterson, M.G., West, M.A., Shackleton, V.J., Dawson, J.F., Lawthom, R., Maitlis, S., Robinson, D.L. and Wallace, A.M. (2005). Validating the organisational climate measure: Links to managerial practices, productivity and innovation, *Journal of Organisational Behaviour,* 26, pp. 379 – 408.

Payne, R.L. and Pugh, D.S. (1976). Organisational structure and climate in *Handbook of Industrial and Organisational Psychology.* pp. 1125-1173. Rand McNally: Chicago.

Payne, R. and Mansfield, R. (1978). Correlates of individuals' perceptions of organisation climates, *Journal of Occupational Psychology*, 51, pp. 209-218.

Penrose, E. (1995). *The Theory of the Growth of the Firm,* 3rd edition, Oxford University Press: Oxford.

Peters, T. (1994). Innovation myths destroyed, *Forbes,* 154(13), pp. 182-184.

Perry-Smith, J.E. and Shalley, C. E. (2003). The social side of creativity: A static and dynamic social network perspective, *Academy of Management Review*, 28, pp. 89-106.

Petelis, C.N. (2007). A behavioral resource-based view of the firm: The synergy of Cyert and March (1963) and Penrose (1959), *Organization Science,* 18(3), pp. 478-490.

Pil, F. and MacDuffie, J.P. (1996). The adoption of high involvement work practices, *Industrial Relations*, 35(3), pp. 423–55.

Polanyi, M. (1966; reprinted 1983). *The Tacit Dimension*, Gloucester Mass. Peter Smith 1983.

Porter, M. (1980). *Competitive Strategy: Techniques for Analysing Industries and Competitors*, Free Press: New York.

Porter, M. (1991). How competitive forces shape strategy. In *Strategy: Seeking and Securing Competitive Advantage,* Montgomery, C. and Porter, M. (eds), Harvard Business School Press: Boston, MA: 11-26.

Porter, M. (1996). What is strategy? *Harvard Business Review*, 74(6), pp. 61-80.

Prahalad, C.K. and Hamil, G. (1990). The core competency of the corporation, *Harvard Business Review*, Vol. 68, Issue 3, pp. 79-91.

Priem, R. and Butler, J. (2001). Is the resource-based 'view' a useful perspective for strategic management research?' *Academy of Management Review*, 26, pp. 22-40.

Prieto, I.M., Revilla, E. and Rodríguez-Prado, B. (2009). Building dynamic capabilities in product development: How do contextual antecedents matter? *Scandinavian Journal of Management,* 25**,** pp. 313-326.

Prieto, I.M. and Easterby-Smith, M. (2006). Dynamic capabilities and the role of organisational knowledge: An exploration, *European Journal of Information Systems*, 15, pp. 500-510.

Purcell, J. and Hutchinson, S. (2007). Front-line managers as agents in the HRM-performance chain: Theory analysis and evidence, *Human Resource Management Journal*, 17(1), pp. 3-20.

Ramstad, E. (2009). Promoting performance and the quality of life simultaneously, *International Journal of Productivity and Performance Management*, 58(5), pp. 423-436.

Ramstad, E. (2009). Expanding innovation system and policy – an organisational perspective, *Policy studies.* First article, pp. 1-21.

Read, A. (2000). Determinants of successful organisational innovation: A review of current research, *Journal of Management Practice,* 3(1), pp. 95-119.

Rice, G. (2006). Individual values, organisational context, and self-perceptions of employee creativity: Evidence from Egyptian organisations, *Journal of Business Research,* 59, pp. 233-241.

Rindova, V.P. and Kotha, S. (2001). Continuous "morphing": Competing through dynamic capabilities, form and function, *Academy of Management Journal,* 44(6), pp. 1263-1280.

Rousseau, D.M. (1995). *Psychological Contracts in Organisations: Understanding Written and Unwritten Agreements,* Thousand Oaks, Sage: CA.

Rousseau, D.M. (2004). Psychological contracts in the workplace: Understanding ties that motivate, *Academy of Management Executive*, 18, pp. 120-127.

Rousseau, D. (2006). Is there any such thing as evidence-based management? *Academy of Management Review,* 32(2), pp. 256-269.

Sarwar, A. and Khalid, A. (2011). Impact of employee empowerment on employee job satisfaction and commitment within the organisation, *Interdisciplinary Journal of Contemporary Research in Business,* 3(2), pp. 664-683.

Savaneviciene, A. and Stankeviciute, Z. (2010). The models exploring the black box between HRM and organisational performance, *Engineering Economics,* 21(4), pp. 426-434.

Seale, C. (2007). *The Quality of Qualitative Research,* SAGE Publications: London.

Seligman, M.E.P., Steen, T.A., Park, N. and Peterson, C. (2005). Positive psychological progress: Empirical validation of intervention, *American Psychologist*, 60(5), pp. 410-21.

Selye, H. (1976a). *Stress in Health and Disease*, Boston: Butterworths.

Selye, H. (1976b). *The Stress of Life*, (rev edn), New York: McGraw-Hill.

Schneider, B. (1990). The climate for service: An application of the climate construct. In Schneider, B. (Ed.) *Organisational Climate and Culture*, Jossey Bass: San Francisco.

Schneider, B. (2000). The psychological life of organisations. In N.M. Ashkanasy, C. P. M. Wilderon, and M. F. Peterson (Eds), *Handbook of organisational culture and climate* (pp. xvii-xxi). Thousand Oaks, Sage: CA.

Schumpeter, J. (1934). *The Theory of Economic Development,* Harvard University Press. Cambridge: US.

Schumpeter, J.A. (1983). *The Theory of Economic Development*, Transaction Books: New Brunswick.

Schumpeter, J.A. (2005). Development, *Journal of Economic Literature, (*March), pp. 108-120.

Shipton, H., West, M., Dawson, J., Birdi, K. and Patterson, M. (2006). HRM as a predictor of innovation, *Human Resource Management Journal*, 1, pp. 3-27.

Shipton, H.J., West, M.A., Parkes, C.L. and Dawson, J.F. (2006). When promoting positive feelings pays: Aggregate job satisfaction, work design features, and innovation in manufacturing organisations, *European Journal of Work and Organisational Psychology.* 15(4), pp. 404 – 430.

Shalley,C.E. and Zhou, J. (2009). Organisational creativity research: A historical overview. in Zhou, J and Shalley,C.E . (Ed.), *Handbook of Organisational Creativity*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc. Psychology Press.

Shirom, A. (2007). Explaining vigour: On the antecedents and consequences of vigour as appositive affect at work. Chapter 7 in *Positive Organisational Behaviour*, by Nelson, D.L. and Cooper, C.L. (Ed). Sage Publications, London: Thousand Oaks Calefornia: New Delhi.

Simmons, B. L., and Nelson, D.L. (2007). Eustress at work: extending the holistic model of stress. In Nelson, D.L. and Cooper, C.L. *Positive Organisational Behaviour: Accentuating the Positive at Work.* pp. 40-53. Sage Publishing. London: Thousand Oaks Calefornia: New Delhi.

Skarzynski, P. and Gibson, R. (2008). *Innovation to the Core: A Blueprint for Transforming How Your Company Innovates*, Harvard Business Press: Boston MA.

Slappendel, C. (1996) Perspectives on innovation in organisations, *Organisation Studies*, 17, pp. 107-129.

Smith, K.G., Collins, C.J. and Clark, K.D. (2005). Existing knowledge, knowledge creation capability, and the rate of new product introduction in high-technology firms, *Academy of Management Journal,* 48(2), pp. 346-357.

Sobel, M.E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology*. Edited by Leinhardt, S. pp. 290-312. Washington DC. American Sociological Association.

Spreitzer, G.M., Kizilos, M.A. and Nason, S.W. (1997). A dimensional analysis of the relationship between psychological empowerment and effectiveness, satisfaction and strain, *Journal of Management*, 23, pp. 679-704.

Spreitzer, G.M., Sutcliffe, K., Dutton, J.E., Sonenshein, S. and Grant, A.M. (2005). A socially embedded model of thriving at work, *Organisation Science,* 16(5), pp. 537-50.

Spreitzer, G.M. and Sutcliffe, K.M. (2007). Thriving in organisations. Chapter 6 in *Positive Organisational Behaviour*, by Nelson, D., and Cooper, C., (Ed). Sage Publications.

Strategy for Science, Technology and Innovation 2006-13. (2006). Department of Enterprise, Trade and Employment. Government Stationery Office, Dublin.

Subramony, M. (2009). A meta-analytical investigation of the relationship between HRM and firm performance, *Human Resource Management*, 48, pp. 745-768.

Takeuchi, R., Wang, H., Lepak, D and Takeuchi, K. (2007). An empirical examination of the Mechanisms between high performance work systems and the performance of Japanese organisations, *Journal of Applied Psychology*, 92(4), pp. 1069-1083.

Takeuchi, R., Chen, G. and Lepak, D. (2009). Through the looking glass of a social system; Cross-level effects of high-performance work systems on employees' attitudes, *Personnel Psychology*, 62, pp. 1-29.

Taylor, J. and McAdam, R. (2004). Innovation adoption and implementation in organisations: A review and critique, *Journal of General Management*, 30(1), pp. 17-38.

Teece, D.J. and Pisano, G. (1994). The dynamic capabilities of the firm: An introduction*, Industrial and Corporate Change,* 3(3), pp. 537-556.

Teece, D.J., Pisano, G. and Shuen, A. (1997). Dynamic capabilities and strategic management, *Strategic Management Journal,* 18(7), pp*. 509-533.*

Teece, D.J. (2006). Reflections on "Profiting from Innovation", *Research Policy,* 35, pp. 1131-1146.

Teece, D.J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance, *Strategic Management Journal,* 28, pp. 1319-1350.

The Changing Workplace: A survey of employees' views and experiences, National Centre for Partnership and Performance, (NCPP), (2004).

Thompson, M. (2007). Innovation in work practices: A practice perspective, *The International Journal of Human Resource Management*, 18(7), pp. 1298-1317.

Tidd, J., Bessant, J. and Pavitt, K. (2001). *Managing Innovation: Integrating Technological, Market and Organisational Change*, Wiley: UK.

Tsoukas, H. (1996). The firm as a distributed knowledge system: A constructionist approach, *Strategic Management Journal*, 17, pp. 11-25.

Van de Ven, A.H., Polley, D.E., Garud, R. and Venkataraman, S. (1999) *The Innovation Journey,* OUP: New York.

Vanhala, S. and Tuomi, K. (2003). Individual, organisational and work-related determinants of employee wellbeing, *EBS Review,* (Autumn), pp. 70-81.

Wall, T. and Woods, S. (2005). The romance of human resource management and business performance and the case for big science, *Human Relations*, 58(Issue 4), pp. 429-462.

Wang, C.L. and Ahmed, P.K. (2004). The development and validation of the organisational innovativeness construct using confirmatory factor analysis, *European Journal of Innovation Management,* 7, pp. 303–313.

Wang, C. Y., Jaw., B. and Tsai, C.H. (2012). Building dynamic capabilities: A human capital perspective, *The International Journal of Human Resource Management,* 23(6), pp. 1129-1157.

Wang, C.L. and Ahmed, P.K. (2007). Dynamic capabilities: A review and research agenda, *International Journal of Management Review,* 9(1), pp.31–51.

Wernerfelt, B. (1984). A resource-based view of the firm, *Strategic Management Journal,* 5, pp. 171-180.

Wernerfelt, B. (1995). The resource-based view of the firm: ten years after, *Strategic Management Journal*, 16, pp. 171-174.

Wenger, E. (2001). *Communities of Practice: Learning, Meaning and Identity*, Cambridge University Press: Cambridge, UK, (Orig. 1998).

West, M.A. (1990). The social psychology of innovation in groups. In M.A. West and J.L. Farr (Eds), *Innovation and Creativity at Work: Psychological and Organisational Strategies*. pp. 309-333. Chichester, England, Wiley.

West, M.A., Patterson, M.G. and Dawson, J.F. (1999). A path to profit? Teamwork at the top, *Centrepiece,* 4, pp. 6-11.

West, M.A., Hirst, G., Richter, A. and Shipton, H. (2004). Twelve steps to heaven: successfully managing change through developing innovative teams, *European Journal of Work and Organisational Psychology*. 13(2), pp.269-299.

West, M.A. and Richter, A. (2007). Climates and cultures for innovation and creativity at work. In Zhou, J and Shalley, C.E. (Ed.), *Handbook of Organisational Creativity*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Williamson, O.E. (1998). Transaction cost economics: How it works, where it is headed, *De Economist,* 146(1), pp.23-58.

Winter, S. (1987). Knowledge and competence as strategic assets, in David Teece (Ed.), *The Competitive Challenge – Strategies for Industrial Innovation and Renewal,* Cambridge, MA: Ballinger.

Winter, S.G. (2003). Understanding dynamic capabilities, *Strategic Management Journal,* 24, pp. 991-995.

Woodman, R.W., Sawyer, J.E. and Griffin, R.W. (1993). Towards a theory of organisational creativity: Interactive effects on creative performance, *Journal of Applied Psychology*, 83, pp. 261-276.

Wright, P. M. and Gardner, T.M. (2003). The human resource-firm performance relationship: Methodological and theoretical challenges, in Holman, D., Wall, T.D. Clegg, T.D., Sparrow P. and Howard, A. (Eds), *The New Workplace : A Guide to the Human Impact of Modern Working Practices,* Wiley, Chichester.

Wright, P. and Nishii, L. (2006). Strategic human resource management and organisational behavior: Integrating multiple Levels of Analysis. *Working Paper 06-05, CAHRS, Cornell University,* Ithaca: New York.

Zhou, J. and George, J.M. (2003). Awakening employee creativity: The role of leader emotional intelligence, *The Leadership Quarterly,* 14, pp. 545-568.

Zaltman, G., Duncan, R. and Holbeck, J. (1973). *Innovation and Organisations*, New York: Wiley.

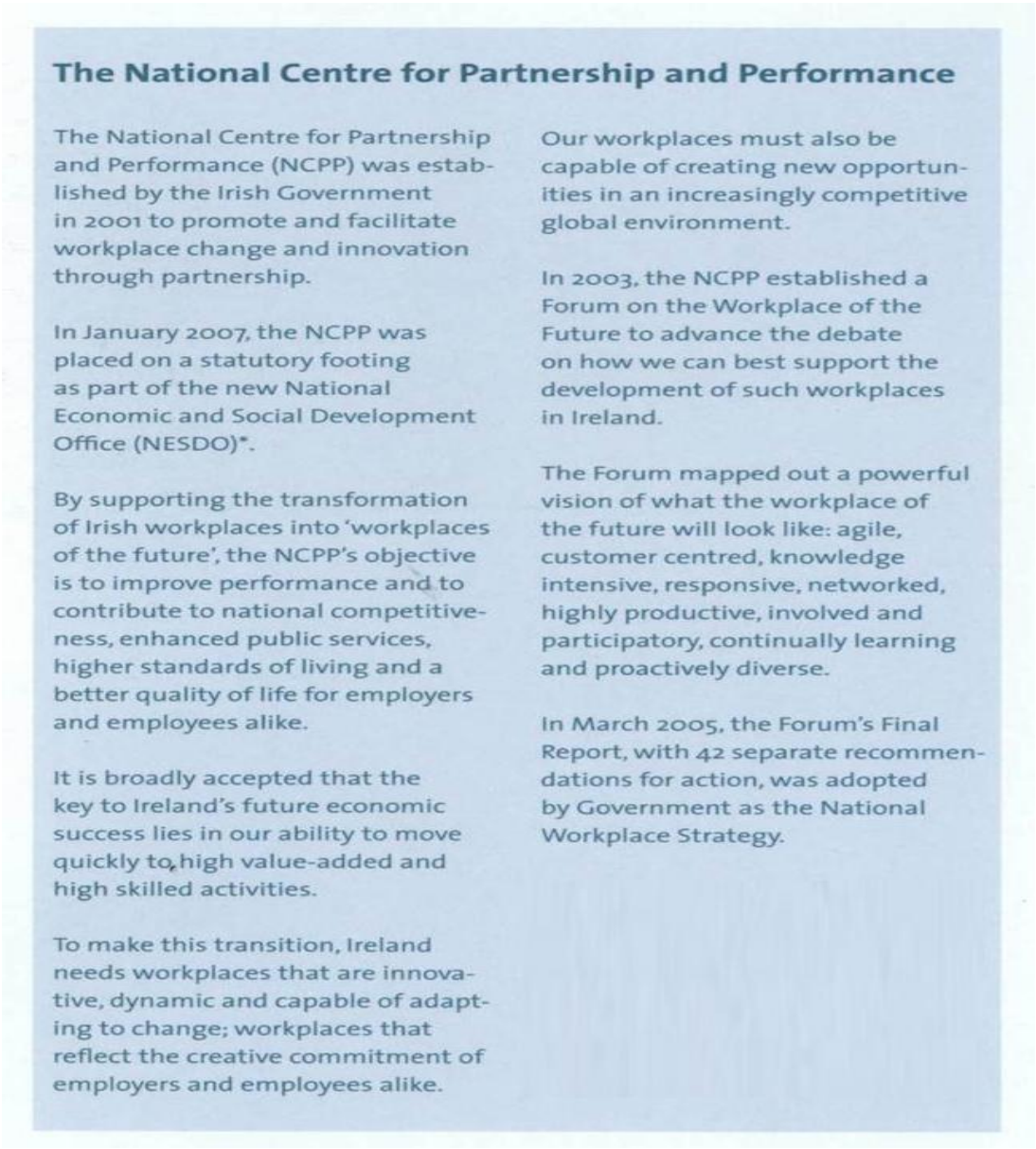
Zhang, Y. and Begley, T. (2011). Perceived organisational climate, knowledge transfer and innovation in China-based research and development companies, *The International Journal of Human Resource Management*, 22(1), pp.34-56.

Zollo, M. and Winter, S.G. (2002) Deliberate learning and the evolution of dynamic capabilities, *Organization Science,* 13(3), pp. 339-351.

Zhou, J. and Shalley, C.E. (Ed.) (2009). *Handbook of Organisational Creativity*, Mahwah, NJ: Lawrence Erlbaum Associates, Inc. Psychology Press

Appendix A:
National Centre for Partnership and Performance (NCPP)

Brief information on the NCPP extracted from publications and website material is provided below.



The National Centre for Partnership and Performance

The National Centre for Partnership and Performance (NCPP) was established by the Irish Government in 2001 to promote and facilitate workplace change and innovation through partnership.

In January 2007, the NCPP was placed on a statutory footing as part of the new National Economic and Social Development Office (NESDO)*.

By supporting the transformation of Irish workplaces into 'workplaces of the future', the NCPP's objective is to improve performance and to contribute to national competitiveness, enhanced public services, higher standards of living and a better quality of life for employers and employees alike.

It is broadly accepted that the key to Ireland's future economic success lies in our ability to move quickly to high value-added and high skilled activities.

To make this transition, Ireland needs workplaces that are innovative, dynamic and capable of adapting to change; workplaces that reflect the creative commitment of employers and employees alike.

Our workplaces must also be capable of creating new opportunities in an increasingly competitive global environment.

In 2003, the NCPP established a Forum on the Workplace of the Future to advance the debate on how we can best support the development of such workplaces in Ireland.

The Forum mapped out a powerful vision of what the workplace of the future will look like: agile, customer centred, knowledge intensive, responsive, networked, highly productive, involved and participatory, continually learning and proactively diverse.

In March 2005, the Forum's Final Report, with 42 separate recommendations for action, was adopted by Government as the National Workplace Strategy.

NCPP (National Centre for Partnership and Performance)

On 1st April 2010, as part of a wider organizational restructuring within NESDO, the National Centre for Partnership and Performance (NCPP) was dissolved and its core functions integrated into the NESC. The NESC Council has been asked to adapt its work programme to ensure that appropriate aspects of the work of the NCPP are continued.

The National Economic and Social Development Office (NESDO) was established by the National Economic and Social Development Office Act, 2006. The functions of NESDO are to advise the Taoiseach on all strategic matters relevant to the economic and social development of the State

Appendix B: Respondent Details

Presented below are some further details related to the respondents in the sample. In particular frequency tables are outlined detailing organisation position/ responsibility, sector of respondent's organisation, size of respondent's organisation and finally level of respondent's education.

Grades_A12

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employee	3273	64.1	64.1	64.1
	Supervisor	582	11.4	11.4	75.4
	Middle Management	816	16.0	16.0	91.4
	Senior Management	439	8.6	8.6	100.0
	Total	5110	100.0	100.0	

Sector

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Public Sector	1849	36.2	36.7	36.7
	Commercial Semi-State sector	262	5.1	5.2	41.9
	Private Sector	2931	57.4	58.1	100.0
	Total	5042	98.7	100.0	
Missing	System	68	1.3		
Total		5110	100.0		

Firmsize_A8

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 - 4	465	9.1	9.3	9.3
	5 - 19	1194	23.4	23.8	33.1
	20 - 25	445	8.7	8.9	42.0
	26 - 49	617	12.1	12.3	54.3
	50 - 99	568	11.1	11.3	65.6
	100 - 499	984	19.3	19.6	85.2
	500+	741	14.5	14.8	100.0
	Total	5014	98.1	100.0	
Missing	System	96	1.9		
Total		5110	100.0		

Education_H19A

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	None/Primary Certificate or equivalent	121	2.4	2.4	2.4
	Some secondary (no exam)	124	2.4	2.4	4.8
	Junior/Inter/Group certificate/lower second level	526	10.3	10.3	15.2
	Leaving Certificate/upper second level	1288	25.2	25.3	40.5
	PLC, Certificate or diploma	1103	21.6	21.7	62.2
	Third Level Bachelors Degree	1202	23.5	23.6	85.8
	Postgraduate degree	720	14.1	14.2	100.0
	Total	5084	99.5	100.0	
Missing	System	26	.5		
Total		5110	100.0		

Appendix C: Respondent Demographics

The survey questions below outline the respondent demographics from the National Workplace Survey of Employee (NCPP, 2009).

Questionnaire :

Section A Labour Market Details:

I would like to begin by asking you some general questions about your present position regarding employment.

A.1a Are you currently in employment for at least one hour per week?

☐ Yes ☐ No

A.1b How would you best describe your present situation regarding employment? Are you :

☐ Employee/Apprentice ☐ Self-employed

☐ Unpaid family worker ☐ Community Employment Scheme (CE)

Other ☐

Now I would like to ask you some questions about your present job.

A.2 How many jobs do you have at the moment (including part-time job)?

☐

A.3 When did you begin your present employment?

month year

A.4 Please describe as fully as possible the exact nature of your current job.

A.5 What is the main activity of the business or organisation where you work.

A.6 In which of the following sectors do you work?

☐ Public Sector ☐ Commercial Semi-State sector

☐ Private Sector

A.7 Are you employed in the:

☐ Civil Service ☐ Local Govt ☐ Health Sector

☐ State Agencies ☐ Gardai/Defence forces

Other (Specify)

A.8 How many people work in the branch or outlet of the business or organisationin in which you work?

☐ 1-4 ☐ 5-19 20- ☐ 25

26- ☐ 49 50- ☐ 99 100- ☐ 499

☐ 500+

A.9 And now I'd like you to think in terms of the full enterprise or business in all its branches. How many people work, in all branches or outlets throughout the Republic of Ireland in the business or organisation in which you work?

☐ 1-4 ☐ 5-19 20- ☐ 25

26- ☐ 49 50- ☐ 99 100- ☐ 499

☐ Don't know

A.10 Do you supervise or manage any personnel in your job?

☐ Yes **A.11 How many?** No ☐

A.11 Which of the following best describes your job?

☐ Senior Management ☐ Middle Management

☐ Supervisor Employee ☐

A.12 How many days do you normally work each week?

☐

A.13 How many hours do you normally work each week in your main job, including regular overtime?

☐ hours per week

A.14 How often does your work involve working unsocial hours

(i.e weekends, evenings, nights)?

☐ Never ☐ Once a month ☐ Less than once a month

☐ Every week ☐ (Don't Know) ☐ Several times a month

A.15 Please think back over the last four working weeks, not including holiday weeks. How many days, if any, were you absent from work because of illness or other reasons (except holidays) over the last four weeks.

☐ days

A.16 Are you employed on (a) a permanent basis; (b) on a temporary/contract basis; (c) a casual basis?

☐ Permanent ☐ Casual ☐ Temporary/contract

A.17 Are you a direct employee of the organisation where you work or an agency worker?

☐ Direct employee ☐ Agency worker

A.18 Which of the following best describes your situation before working for your current employer? Were you:

☐ Employed on a full-time basis

☐ Employed on a part-time basis

☐ Self-employed/Farmer

☐ Unemployed

☐ On home duties

☐ Full-time education

Other (specify) ☐

Appendix D: Survey Questions

Survey questions from the National Workplace Survey of Employees (NCPP, 2009) used in this research investigation are outlined below.

Independent variables **Organisational Innovation Strategies**	
Empowerment enhancing strategies: **Communication**	**E2 I am going to read out 7 aspects of your work. For each of these that apply to your organisation, please tell me whether or not you receive information from management on a regular basis, occasionally or hardly ever.** **Regular basis: Occasionally : Hardly ever : Has not arisen** (a) Plans to develop new products or services (b) Plans to introduce new technology (c) Plans to re-organise the company (d) Plans to change work practices e.g. working in teams etc. (e) Plans for staff reductions
Consultation	**E3.A. Now we would to ask you some questions about your experiences of decision making and communication in your company or organisation** **Almost always : Often: Sometimes : Rarely: Never** (a) How often are you and your colleagues consulted before decisions are taken that affect your work (b) If changes in your work occur, how often are you given the reason why? (c) If you have an opinion different from your supervisor/manager can you say so (d) If you are consulted before decisions are made, is any attention paid to your views or opinions

Relational capital	**F3.** Broadly speaking, how would you describe the relationship **Very good ; Good; Neither good nor bad; Very bad; Bad; Not applicable.** **(i) Between staff and management in your workplace** **(ii) In general between different staff members**
Access to Training	**I would like to ask you a few questions about any education or training which has been paid for or provided by your current employer over the last two years.** **D.2** Have you received any education or training paid for or provided by your employer over the last two years **Yes** ☐ **No** ☐

Mediators **Innovation Climate Scale**	
Innovation Climate	**B2 I am going to read out 8 statements that might apply to the organisation you work for. For each statement I would like you to tell me whether you strongly agree; agree; disagree or strongly disagree.** **Strongly agree: Agree: Disagree: Strongly disagree** (a) New ideas are readily accepted in my workplace (b) People in my organisation are always searching for new ways of looking at problems (c) Customer needs are considered top priority in my organisation (d) The organisation is prepared to take risks in order to be innovative (e) This organisation is quick to respond when changes need to be made (f) This organisation is continually looking for new opportunities in a changing environment

3. Dependent variables Innovation outcomes	
Organisational outcomes	
New services, products and new workplace innovations	**New products and services** **C.4 During the LAST TWO YEARS, did your organisation introduce;** New or significantly improved services Yes…… No….. New or significantly improved products Yes….. No…… Any innovations in the workplace such as new ideas, processes or behaviours that led to significant improvements in the way the work is carried out. **Yes….. No……**
Employee outcomes	
Commitment	**Commitment** **B1 Strongly agree: Agree: Disagree: Strongly disagree** (f) I am willing to work harder than I have to in order to help this organisation succeed (g) My values and the organisation's values are very similar (h) I am proud to be working for this organisation (I) I would turn down another job with more pay in order to stay with this organisation (j) I would take almost any job to keep working for this organisation (k) I feel very little loyalty to the organisation I work for (reversed)
Job satisfaction	**Job satisfaction** **B1 Job Satisfaction** **Strongly agree: Agree: Disagree: Strongly disagree** (a) In general, I am very satisfied with my current job (b) I am satisfied with my physical working conditions (C) I am satisfied with my hours of work (d) I am satisfied with my earnings from my current job

Wellbeing	**Work stress and pressure** **B 9. How often do you ……** **Always : Often: Sometimes : Hardly ever : Never: Not applicable** (a) Find your work stressful (b) Come home from work exhausted (c) Find that your job prevents you from giving the time you want to your partner or family (d) Feel too tired after work to enjoy the things you would like to do at home (e) Find that your partner/family gets fed up with the pressure of your job.