

ACCOUNTING INFORMATION IN NEW PRODUCT DEVELOPMENT: A STRUCTURATION PERSPECTIVE

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A dissertation submitted to Dublin City University
Business School

In partial fulfilment of the requirements for the degree of
DOCTOR OF PHILOSOPHY

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April 2013

DECLARATION

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

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ACKNOWLEDGEMENTS

First and foremost I wish to express my sincere thanks to my supervisor and friend, Prof. Bernard Pierce. Bernard goes above and beyond the call of duty in his support and has always been generous with his time despite an often hectic schedule. Many people describe the PhD process as a type of academic apprenticeship in which case I consider myself very lucky to have served this apprenticeship under the guidance of such a knowledgeable and supportive mentor. I also enjoyed our frequent diversions from academic matters to discuss the pressing sporting issues of the day!

I also want to say a quick thank you to Amanda Kavanagh for working magic with Bernard's diary during his time as Executive Dean. She always found precious space in that diary!

Thank you to my second reader, Prof. Barbara Flood. I found the 6 monthly reviews an extremely helpful part of the PhD process, primarily due to the advice received from Barbara. Thanks also to those who have chaired these reviews over the years – Dr. Siobhain McGovern, Prof. Colm O’Gorman and Dr. Teresa Hogan.

Thanks again to Dr. Teresa Hogan for guiding me through the administrative quagmire that is PhD submission and thank you to Rachel Keegan for her administrative support throughout the entire PhD.

I wish to thank friends and colleagues in the Business School, particularly in the Accounting Group, for their support. Thanks to all who attended the DCUBS research seminar series for providing a sounding board as well as valuable feedback. A number of colleagues took time out to read material and provide feedback and expertise over the years, a particular thanks to Ms Brid Murphy, Dr. Siobhain McGovern and Dr. Martin Quinn.

Thanks also to Mr. Tony O’Dea of University College Dublin for his advice when preparing for data collection.

I am extremely grateful to the staff of Magma, MMD, Topwood and Metbuild for participating in this study. Access to a site for a case study of this nature is something akin to a search for the Holy Grail for a qualitative researcher. It is almost impossible to express the extent of my gratitude to those individuals who made time in already hectic schedules to participate in the interviews and provide documentation. Their honest and candid insights made this study possible.

I wish to thank my long-suffering friends who have listened to my obsession with this PhD for many years. I can actually feel them willing this thing over the line. A special thank you to my ‘PhD buddies’ Tara and Cliona, I think we often propped each other up along the way.

Thank you to my wonderful family. My parents, Anne and Tom, my siblings Carmel, Paul and Brendan and their other halves, Martin, Nuala and Lorraine, as well as all of my gorgeous nieces and nephews- thank you for your ongoing support. No more big projects for a while, I promise (Except for the obvious)! Thanks also to my fantastic 'in-laws' in Galway- Martin and Bridgie and Claire, Sharon, Martin and Lorraine.

Thank you to my ever supportive husband, David. Through the long hours, the deadlines, the last minute holiday cancellations and the ongoing neuroses, you never lost patience with it and you never had any doubt that I would get there in the end. Your confidence in me is often what kept me going. Quite simply, I would never have pulled it off without you by my side. I am now eagerly anticipating the arrival of our next 'big project'!

Finally, I have found the writing of this PhD to be challenging, frustrating and, yes, even enjoyable, in equal measure. While there have been tough days and a few tantrums along the way, there is no doubt that it has been an enormously rewarding journey. It is impossible to express how much I have learned along the way and I look forward to carrying all of this into my academic career in the future. To any doctoral students reading this, it is worth it, I promise!

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ABSTRACT

New product development (NPD) plays a key role in sustaining competitiveness for many organisations. Accounting information is presented in the literature as a valuable NPD resource, which facilitates cross-functional dialogue, communicates profit objectives and supports managers in managing resources and controlling costs. However, these assertions are largely normative. They have not been firmly established in the empirical literature resulting in an unclear picture of how managers use accounting information in an NPD context. With this in mind, the objective of this dissertation is to explore the role of accounting information in NPD.

To meet the objective of the study an in depth case study of the manufacturing division of a large group was conducted. The findings are explored using Structuration Theory as a theoretical lens. Structuration Theory provides a model which allows us to make sense of social actions in organisations or institutions. NPD is a complex social action involving a wide range of agents all acting together but in different ways, guided by their own internal structures as well as by external social structures. By using Structuration Theory it was possible to explore the detailed nature of structures, both internal and external, which shape managers' use of accounting information during NPD.

The findings demonstrate how managers in different circumstances throughout the case group use accounting information in different ways, and often differ in their perceptions of what constitutes accounting information. Senior managers review aggregated pro-forma schedules of accounting information prepared by the Finance function at pre-determined points in the formal NPD process. In contrast, members of the NPD Team draw on simpler, less sophisticated accounting information, on an improvised basis, throughout NPD. This illustrates how the senior managers' use of accounting information is informed by the rules and normative expectations associated with the formal NPD process, while the routines and recognisable language associated with accounting information influence its more informal use by members of the NPD Team. However, these rules and routines cannot be examined in isolation from the human beings who draw on them. A manager's use of accounting information is guided as much by his phenomenological perspective as it is by the institutionalised structures he encounters. This recognition of the significance of agency and structure is the central tenet of Structuration Theory.

The study adds to existing literature on the role of accounting information in NPD by providing empirical evidence of the multi-dimensional use of accounting information in an NPD context. It also contributes to a wider stream of literature which examines the changing role of the management accountant by exploring the implications of the decentralisation of accounting information. The study also presents a number of theoretical contributions. Firstly, it broadens our understanding of the sociological processes effecting accounting information systems in action. Secondly, it offers enhanced insights into issues of freedom, choice and determination within external structures. Finally, by operationalising Structuration Theory in a way that few studies have to date, the study demonstrates the potential for Structuration Theory to guide future empirical research.

LIST OF ABBREVIATIONS

A	:	Agency
ABC	:	Activity based costing
ABCM	:	Activity based cost management
ANT	:	Actor network theory
BS	:	Balanced scorecard
CNPD	:	Concurrent new product development
CVP	:	Cost volume profit
DCF	:	Discounted cash flows
ERP	:	Enterprise resource planning
EU	:	European Union
IPO	:	Initial public offering
IT	:	Information technology
JDA	:	Joint development agreement
KSTA	:	Knowledge of structures and theories of action
KPI	:	Key performance indicator
MA	:	Management accountant
MAS	:	Management accounting systems
MMD	:	Magma Manufacturing Division
NPV	:	Net present value
R&D	:	Research and development
ROI	:	Return on investment
S	:	Structure
SCM	:	Strategic cost management
SMA	:	Strategic management accounting
TQM	:	Total quality management
UK	:	United Kingdom

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Chapter One

Background and Overview of the Study

1.1 INTRODUCTION

This research explores the role of accounting information in New Product Development (NPD). In order to set the context for the study this chapter first discusses the broader issue of innovation, before briefly introducing issues pertaining to NPD and the changing role of management accounting. The motivation for the research is then articulated and the study's theoretical perspective is outlined.

Section 1.2 introduces the concept of innovation by firstly examining it from an economic perspective and by exploring differences in patterns of innovation across countries and industrial sectors. Section 1.2.2 then examines innovation at a micro-level, exploring some of the issues associated with the management of innovation in an organisational context. NPD is examined in detail in Chapter Two but a brief overview of some key NPD issues is presented in Section 1.3, specifically the challenges associated with the financing and management of NPD, as well the role of the accountant in the NPD process. Section 1.4 provides a brief overview of the large body of literature surrounding the broad issue of the changing role of the management accountant. Section 1.5 describes how the convergence of these two streams of literature provides the motivation for this study. Section 1.6 provides a brief introduction to the theoretical framework underpinning the study. Section 1.7 sets out how the thesis is organised.

1.2 INNOVATION

Innovation refers to any change in the product or service range an organisation takes to market. This is most clearly understood as the creation of new products and services but it can include a change in the application of a product or service away from its original purpose, a change in the market to which a product or service is applied, a change in the way a product or service is developed or delivered or perhaps even a change in the organisation's core business model (Johnson, 2001). NPD is a sub-process of innovation. The development of new products is the process of transforming business opportunities into tangible products. It is the primary means by which companies execute their innovative strategy (Trott, 2005).

There are two main strands of innovation research evident in the literature. The economic perspective addresses innovation within countries and industry sectors, while the organisation perspective addresses the innovation process within organisations. In exploring the role of accounting information in NPD this study takes an organisation perspective. However, in order to appreciate the growing research agenda associated with innovation in both international and national contexts, the next section briefly examines innovation through an economic lens.

1.2.1 An economic perspective

The relationship between innovation and economic development is widely acknowledged. The economist Joseph Schumpeter, the founder of modern economic growth theory in the 1930s, was the first to assert that the development and diffusion of new technologies formed a source of economic progress (Schumpeter, 1942). Romer (1990) developed this theory further, arguing that sustained economic growth arises from firms devoting resources to creating new products and developing new ways of making existing ones. As outlined below, this was particularly evident in the second half of the twentieth century which was a period of significant economic growth world-wide.

After the Second World War most industrial sectors experienced a rapid acceleration in the diffusion of technological change and world-wide access to codified knowledge. These changes were first evident in Europe but Japan soon caught up in terms of technological development and consumer consumption (Nijkamp, van Delft and van Veen Groot, 2005). This was followed by the newly industrialising South East Asian economies, while the late 1990s saw the integration of the large emerging economies such as Brazil, Russia, India and China (Grossman and Helpman, 2001). In the last two decades, developments in the areas of productivity, technology, international competition and world-wide trade have merged to bring about a global innovation imperative which has put pressure on companies all over the world to launch more and more new products and services (Dougherty, 1990). This means

developing products more quickly with little room for new product failure (Browne and Eisenhardt, 1995; Wind and Mahajan, 1997).

1.2.1.1 Innovation in a European context

European companies have a strong tradition in generating ideas and inventions but historically have been regarded as poor at bringing them to market. In response, European Union (EU) policy has increased its focus on industry-driven, applied research and development (R&D). In 2006, the European Parliament established a competitiveness and innovation framework programme for the period 2007-2013 with the aim of supporting innovation activities, providing better access to finance and delivering business support services throughout Europe. Education was seen as a vital part of this development of an innovation-oriented society, through the acquisition of entrepreneurial, managerial, scientific, mathematical and foreign-language skills, as well as digital literacy. European policymakers have expressed concern at the small number of science and technology graduates who directly apply their education once they move into the labour market. It is believed that a lack of job mobility between universities and the business sector has hindered the transfer of ideas, thereby reducing the EU's innovation performance (Science Technology and Innovation in Europe, 2008).

Increased focus on innovation in Europe is reflected in enhanced R&D spend in the region. In absolute terms, the twenty seven countries in the EU spent a total of €226 million on R&D in 2009, which represents an average annual growth rate of 4.1 % in relation to 2000. In a global context, Japan and the United States registered a decrease over the same period. Since 2000, patenting activity has increased significantly in almost all European countries, as has employment in the high-tech sectors where innovation is most prevalent (Science Technology and Innovation in Europe, 2011).

EU policy has continued to build on this agenda with an increasing focus on strategies which will facilitate the development of research capacity in EU countries. The European Institute of Innovation and Technology was established in 2008 to support the development of sustainable growth and competitiveness in European countries. In 2010, the European Commission set out a comprehensive innovation strategy for

Europe, focusing on major areas such as climate change, energy efficiency and healthy living. Through this innovation strategy the European Commission aims to make Europe a world-class science performer by revolutionising the way public and private sectors work together and removing bottlenecks like expensive patenting, market fragmentation, slow standard setting and skills shortages that currently prevent ideas getting quickly to market (State of the Innovation Union, 2011).

The focused innovation agenda of European policy makers, and the response by companies throughout Europe in terms of increased R&D activity, leaves us in no doubt as to the growing importance of innovation in a European context. The next section explores the prevalence of this agenda in an Irish context.

1.2.1.2 Innovation in an Irish context

An emphasis on innovation in Ireland¹ began in the early 1990s, as the country emerged from its last recession. Since then, significant support has been given to the expansion of the country's scientific, technological and innovation capacity within the enterprise sector (Forfas, 2004). Despite growing pressure on public expenditure, support for innovation was maintained as a key component of the economic strategy of the 2007-2011 government (Programme for Government 2007 – 2012 Progress Report, 2008).

Innovation has increased significantly in Irish companies since 2000 as evidenced by increased levels of R&D. For example, gross expenditure on R&D increased from just under €1bn in 1998 to €2.6bn in 2008, which accounts for 1.4% of GDP. It is hoped that R&D spending across the economy will rise to 2.1% of GDP by the end of 2013 (Forfas Research and Development Statistics in Ireland, 2009).

The business sectors in Ireland with the largest percentage of firms engaged in innovation are computer and related sectors at 24.5%, followed by the chemicals, chemical products and man-made fibre sectors at 20%. Between 2004 and 2006 over 47% of Irish companies were engaged in innovation placing the country 7th across the

¹ All references to Ireland throughout this section relate specifically to the Republic of Ireland.

EU. In 2008, product innovation contributed an estimated €33.5bn to company turnover in Ireland (Forfas Research and Development Statistics in Ireland, 2009).

As set out in the 2011 Programme for Government, support for innovation has been maintained with an increased focus on investment in innovation at both enterprise level and in the public research system. This support takes the form of a suite of programmes operated by Enterprise Ireland², as well as the introduction of tax relief for R&D expenditures (Report of the Research Prioritisation Steering Group, 2011). These policies have undoubtedly stimulated technological and innovation capacity within the Irish economy, yet the majority of investment in innovation is still funded by the private sector. For example, in 2008 63.2% of gross R&D was financed by industry (Forfas research and development statistics in Ireland, 2009).

There is a sense, however, that innovation in Ireland is as much about entrepreneurialism as it is about economic policy or industrial investment. Entrepreneurs search for, respond to and exploit change with new ideas, products and processes. Established entrepreneurs comprise 8.6% of the adult population, meaning that Ireland has a higher proportion of established entrepreneurs than the majority of its Eurozone counterparts, as well as the UK (6.4%), the US (7.7%) and Australia (8.5%) (Entrepreneurship in Ireland, 2010). Despite government policy encouraging several multinational Information Technology (IT) hardware companies to open manufacturing facilities here, the indigenous IT hardware sector has not grown or developed at any significant rate. Instead it is the local software industry that has risen to prominence, due largely to the innovative endeavours of small groups of entrepreneurs. An example of one such company is Iona, which was established in 1991 and specialised in distributed service-oriented architecture and infrastructure. Iona launched on the NASDAQ in 1997 with, at the time, the fifth-largest software Initial Public Offering (IPO) in the history of the exchange. In doing so, Iona transformed the perception of the Irish indigenous software industry within and outside of Ireland (Breznitz, 2007).

² Enterprise Ireland is the government organisation responsible for the development and growth of Irish enterprises in world markets. They work in partnership with Irish enterprises to help them start, grow, innovate and win export sales on global markets (<http://www.enterprise-ireland.com>).

According to Enterprise Ireland, the bio-medical device sector is also thriving in Ireland, with over 160 medical technology companies, exporting €6.8b worth of product annually and employing 24,000 people - the highest number of people working in the industry in any country in Europe, per head of population. Exports of medical devices and diagnostics products now represent 8% of total merchandise exports and growth prospects for the industry globally remain good. Many of the world's top medical technology companies have invested significantly in Ireland and a number of exciting, research-based, indigenous companies are emerging and competing internationally. Over 90 companies in this sector are indigenous (Entrepreneurship in Ireland, 2010).

The third level sector in Ireland played a vital role in the country's economic growth throughout the 1990s (Report of the Research Prioritisation Steering Group, 2011). It provided a continuous pipeline of highly educated young graduates, particularly in the areas of science and technology, which underpinned the growth of the multi-national company sector in the country. The role of the third level sector is expanding even further in terms of driving economic development. As the global market becomes more sophisticated and demanding, universities are being relied upon to play a crucial role in the development of skilled, qualified people with the potential to become the innovators in industry (Innovation in Ireland, 2008). More specifically, research programmes have been designed to nurture and develop future generations of young researchers, while teaching has become increasingly focused on the financial, regulatory, organisational and entrepreneurial aspects of innovation (Innovation in Ireland, 2008). This has been fostered by a number of government initiatives. The Irish Research Council consists of a board of senior academic and industrial figures, operating multi-million euro research funding initiatives which support talented researchers in their early stage career formation across Masters, Doctoral and Postdoctoral levels. Their funding programmes emphasise exploratory research aimed at yielding new concepts, findings and innovations within Ireland (<http://www.research.ie>). The Advisory Council on Science, Technology and Innovation (ACSTI) make recommendations on how best to support research centres in Ireland with a view to maximising returns from State investments in research, development and innovation (<http://www.sciencecouncilireland.ie>).

The brief examination of innovation from an economic perspective provides some insight into the growing research agenda associated with innovation in an international and national context. Policy makers at both levels recognise that innovation is critical to sustainable development and it is imperative that we learn as much as possible about how to foster it in such a way that it translates to enterprise development and economic growth.

1.2.2 An organisation perspective

The ability to identify and exploit innovation is one of the most fundamental features distinguishing successful from unsuccessful organisations (Dougherty and Hardy, 1996). Companies must be able to adapt and evolve through innovation if they wish to survive (Damanpour, 1991). However, the term innovation is a broad one when used in the context of organisations and may be understood in a variety of ways. Myers and Marquiss (1969) offer one of the more comprehensive definitions:

Innovation is not a single action but a total process of interrelated sub processes. It is not just the conception of a new idea, nor the invention of a new device, nor the development of a new market. The process is all these things acting in an integrated fashion (p. 15).

In this sense, innovation can include anything from minor incremental advances to major radical developments as well as wider organisational changes. Table 1.1 presents a typology of innovation which illustrates the extent to which innovation can include virtually any organisational or managerial change.

This study focuses on product innovation, that is, the creation and subsequent introduction of a good or service that is either new or improved on previous goods or services (Trott, 2005).

From an organisation perspective the focus is less on the concept of innovation and more on the practice of innovation management (Brown and Eisenhardt, 1995). The effective management of the innovation process can lead to corporate success (Dolan, 1992).

Table 1.1: A typology of innovations

<i>Type of innovation</i>	<i>Example</i>
Product innovation	The development of new or improved products
Process innovation	The development of a new manufacturing process
Organisational innovation	A new venture division; a new internal communication system, introduction of a new accounting procedure
Management innovation	Total Quality Management (TQM) system, Business Process Re-engineering (BPR)
Production innovation	Quality circles, Just-in-time (JIT) manufacturing system, new production planning software
Commercial/marketing innovation	New financing arrangement, new sales approach
Service innovation	Internet-based financial services

Trott (2005) p. 17

Innovation is ultimately an organisational activity and central to this activity is the fundamental tension between the need for stability and the need for creativity. On one hand, companies require stability and routine in order to accomplish daily tasks efficiently. On the other hand, companies must nurture a creative environment where new products can be developed and tested (Song and Parry, 1997). Effective innovation management is required in order to achieve this delicate balance. In the context of this study, innovation management involves managing the conditions which must be in place in order to ensure that the organisation is in a position to develop new products. The next section narrows the lens from the wider area of innovation to its more specific sub-process of NPD.

1.3 NEW PRODUCT DEVELOPMENT

This section provides a brief introduction to NPD and to some of the challenges associated with financing and managing NPD. NPD is examined in detail in Chapter Two.

NPD encapsulates all of the activities that an organisation engages in when delivering a product to the market. Some NPD projects may be relatively minor, involving only

small enhancements or improvements to existing products or processes, while others might involve the development of entirely new product platforms and new technologies (Cooper and Kleinschmidt, 1986).

Historically, large firms could insulate themselves from change by resisting innovation and relying on successful product lines for their profits over many years (Scheuing, 1974). However, expanding competition (Browne and Eisenhardt, 1995), increasingly demanding and knowledgeable customers (Dougherty, 1990), rapid developments in science and technology (Capon and Glazer, 1987) and the globalisation of business resulting in increased international competition (Wind and Mahajan, 1997) are contributing to shorter and less predictable product lifecycles and new markets. These, in turn, are putting pressure on firms to develop and launch new products more frequently (Bobrow and Shafer, 1987). All of this means that rapid and successful NPD is now considered critical to business survival (Cooper, 1996).

1.3.1 Financing New Product Development

New product launches are frequently plagued by a shortage of people and time (Cooper and Edgett, 2003). Having a proper NPD strategy and process in place is meaningless if the process is not resourced with the requisite people, time and money (Cooper, 1998). Many NPD projects suffer from a pre-occupation with short-term profitability, driven largely by the financial community (Cooper and Edgett, 2003). New products are expensive to develop. Large manufacturing and service firms including Ford, Siemens, IBM and Microsoft spend billions of dollars on R&D every year, which represents only a portion of total spend on NPD. Heavy complimentary investment in equipment, training, licences, marketing and organisational change is necessary if a new product is to succeed (Pilat and Guinet, 1999). However, managerial short-termism is believed to be a strong inhibitor of NPD investment. This short-termism may be driven by several factors, including executive reward systems, internal performance measurement and management accounting systems, internal capital budgeting and performance appraisal systems, as well as the relationship between head office and divisions (Nixon, 1995).

1.3.2 Managing New Product Development

Successful NPD requires more than a supply of new ideas. It requires the managerial capacity to utilise and develop them effectively. A company needs to have institutional arrangements for communication and coordination which enable all parts to work together effectively (Bowen and Ricketts, 1992). Adequate R&D, marketing, technical, operations, engineering, sales, promotions and logistics skills, as well as senior management commitment are all necessary to ensure successful NPD (Browne and Eisenhardt, 1995; Cooper, 1998; Di Benedetto, 1999). Managers are often juggling too many projects and in the interests of progress and deadlines favour smaller, 'easier to do' projects yielding short-term gains at the expense of long-term sustainability and value. Excessively lean skills resourcing will result in false economies- success rates suffer, re-work and repair costs increase, time to market lengthens and quality suffers (Cooper and Edgett, 2003).

The efficiency of any innovation system depends on the performance of individuals within that system and the institutions that govern their action. Moreover, it depends on interactions between these individuals (Ruane and Siedschlag, 2011). Successful innovation in Japan is associated with cross-functional collaboration and the ability of Japanese companies to ensure that the various functional aspects of the organisation complement each other (Bowen and Ricketts, 1992). Increased interaction between the various departments involved in NPD has long been associated with improved product development performance (Laurence and Lorsch, 1967; Mounaert and Souder, 1990; Cooper, 1990; Kahn, 1996). Nixon and Innes (1998) refer to the concept of 'silent designers'. By this they mean people outside of the formal design process such as R&D and production specialists, marketers and accountants who collaboratively contribute to the design and development of new products.

1.3.3 The role of the accountant in New Product Development

Research examining the accountant's role in NPD has called for accountants to broaden their outlook, tailor their techniques and relax their financial grip (Nixon, 1998; Rabino, 2001; Hughes and Pierce, 2006). In addition, accountants have been

urged to become involved in NPD early in the process and to maintain a high level of involvement throughout (Nixon and Innes, 1997, 1998; Hertenstein and Platt, 1998). The question of the accountant's role in supporting the NPD process is complex. Historically, NPD teams did not utilise accountants to examine the financial dimensions of projects, instead engineers and designers within the NPD team who had an appreciation of accounting, were asked to defend their product designs and capital investment proposals (Halberstam, 1987; Philips and Heskett, 1989; Ellis, 1997). Thus, despite the documented merits of cross-functional collaboration, which is intended to capitalise on the shared expertise of a broad range of individuals working together (Bowen, Clarke, Holloway and Wheelwright, 1994), the literature does not appear to attach the same importance to members of the Finance function as it does to other team members (Katzenbach and Smith, 1993; Deschamps and Nayak, 1995). It has been suggested that the decentralisation of accounting information means that accounting analysis may now just as easily be carried out by financially-astute engineers (Clarke and Fujimoto, 1991) and that accounting information actually provides an integrating vernacular which allows these cross-functional managers to themselves make sense of financial issues throughout the NPD process (Nixon and Innes, 1997, 1998). This occurs despite suggestions in the wider management accounting literature that the role of the accountant is transforming into that of a savvy business partner (Feeney and Pierce, 2007). This issue is examined briefly in the next section.

1.4 THE CHANGING ROLE OF THE MANAGEMENT ACCOUNTANT

A large body of literature exists which discusses the evolution of the management accountant's role from a bean-counter to a type of business advisor (Burns, Ezzamel and Scapens, 1999; Scapens, Ezzamel, Burns and Baldvinsdottir, 2003; Järvenpää, 2007). The decentralisation of accounting information is believed to have discharged the accountant of their traditional score-keeping duties (Siegel and Sorensen, 1999), and the proliferation of an array of contemporary strategic management accounting (SMA) techniques is thought to have enabled the accountant to play a key role in the development and execution of organisational strategy (Burns and Yazdifar, 2001).

Granlund and Lukka (1998, p. 187) recognise the transition in the role of the accountant from that of 'business historian and company watchdog toward a more commercially oriented function'. They describe an expanding role, which incorporates newer and wider dimensions such as consultant, advisor, and change agent, but they believe that these are being carried out alongside the traditional function of financial monitoring and scorekeeping. They question whether both roles should be occupied by the same person. A 'business partner' would place greater emphasis on communication, people skills and general business acumen. The 'controller' would be more mathematically motivated, with a desire to report the facts accurately, as opposed to considering the facts commercially. Sathe (1982) asks if these roles are mutually exclusive. He questions whether one person can simultaneously occupy the role of policeman or umpire versus active participant in the running of the business. This issue recurs in the literature examining Finance and NPD in which the limited involvement of the Finance function on cross-functional teams is attributed to the existence of conflict between accountants and the more creative members of the team (Nixon, 1998).

1.5 MOTIVATION FOR THE STUDY

From an economic perspective innovation is necessary to increase a country's productivity, improve international competitiveness and build real and sustainable growth. From an organisational perspective, without innovation firms cannot introduce new products, new processes or new services and they will find it difficult to gain market share, reduce costs or increase profits.

NPD is a critical sub-process of innovation in organisations encapsulating all of the activities associated with developing a new product. NPD success is increasingly associated with an open and collaborative environment in which individuals from a variety of functions of the organisation contribute to the design and development of new products.

Despite suggestions in the wider management accounting literature that the role of the accountant is evolving from that of a bean-counter to a trusted business advisor,

research focused on NPD questions the extent to which the accountant contributes to the cross-functional NPD process. There are suggestions in the literature that financial analyses within the NPD process are being carried out by financially astute engineers. In this context accounting information is believed to provide a form of discourse amongst cross-functional participants throughout the NPD process, without any need for the involvement of an accountant.

The importance of NPD to economic and organisational growth and prosperity combined with the lack of clarity surrounding both the accountant's role and the use of accounting information in NPD provides the primary motivation for this study. The research objective is discussed in detail in Chapter Four.

1.6 THEORETICAL FRAMEWORK UNDERPINNING THE STUDY

A number of theoretical lenses were considered before deciding that a framework was necessary which would support an exploration of the use of accounting information as a social phenomenon in an organisation. Structuration Theory emerged as an appropriate theoretical lens through which to examine the role of accounting in NPD. Structuration Theory is discussed in detail in Chapter Three and the role of Structuration Theory in informing the study's research design is discussed throughout Chapter Four. This section presents a brief introduction to Structuration Theory and its key concepts before providing the rationale for this choice of theoretical framework.

Structuration Theory is a social theory which analyses both structures and agency without giving primacy to either. The theory was proposed by sociologist Anthony Giddens who presents the concept of 'the duality of structure' to illustrate how structures are both the medium and outcome of social interaction. According to Giddens, structures exist both internally within agents as memory traces that are the product of phenomenological and hermeneutic inheritance, and externally as the manifestation of social actions. Giddens divides these memory traces into three types; structures of signification which inform an agent's understanding and communicate meaning; structures of legitimation which set out the limits of acceptable conduct, and; structures of domination which the agent draws on to exercise power and exert

influence (Giddens, 1984). Giddens' Structuration Theory has been used in management accounting research as a sensitising device facilitating the exploration of how management accounting practices may be implicated in the social order of organisations (Macintosh and Scapens, 1990).

Stones (2005) builds on Giddens' theory. Moving away from what he refers to as Giddens' 'ontology in general' to an 'ontology in situ', Stones presents a strengthened version of Structuration Theory which may be used to guide empirical research in specific contexts. He achieves this by breaking the notion of the duality of structure into four analytically separate components. These are (1) external structures as conditions of action; (2) internal structures within the agent; (3) active agency, i.e. when agents draw on internal structures in producing practical action; and (4) outcomes, as modified external and internal structures and events. In distinguishing between internal and external structures, Stones recognises the need to examine the connecting tissue between the two (Stones, 2005). Stones' model retains Giddens' focus on the knowledgeable and conduct of agents but goes further by seeking to explore how this knowledgeable and conducts is effected by external structures.

Structuration Theory allows us to make sense of social actions in organisations. It provides a framework with which it is possible to explore the detailed nature of the internal and external structures which inform managers' use of accounting information during NPD. Structuration Theory was chosen as a theoretical lens for this study primarily because it places agency and structure, that is people and practice, equally at the centre of the analysis.

1.7 ORGANISATION OF THE THESIS

Chapter Two reviews the relevant empirical literature relating to NPD, the perceived role of the Finance function within NPD and the use of accounting information throughout the process.

Despite providing valuable insights into the relationship between the Finance function, accounting information and NPD, the streams of literature examined in

Chapter Two lacked a theoretical foundation upon which to base a search for deeper insights. Structuration Theory is examined in detail in Chapter Three. This chapter presents the theoretical underpinnings of the study, explaining two key frameworks within Structuration Theory, both of which are employed as theoretical lenses through which the study's findings are interpreted.

As well as presenting the study's research objective, Chapter Four sets out the research design, describing the data collection and data analysis procedures employed. A case study approach was chosen primarily because it allows for the examination of accounting as part of broader organisational and social systems (Ryan, Theobald and Scapens, 2002). In particular, the chapters describes Stones' composite research strategy, which is the methodological approach used to gain depth of insight into the findings of the case study.

The findings of the first phase of the data analysis are reported in Chapter Five which presents a detailed description of the case site and some initial insights into the role of accounting information in NPD. These findings illustrate how managers in different circumstances use accounting information in different ways.

Chapter Six presents the findings of the second stage of data analysis, which involved applying Stones' composite research strategy to six specifically selected agents-in-focus. These findings demonstrate how a manager's use of accounting information is guided as much by his phenomenological perspective as it is by the social institutions he confronts.

Chapter Seven discusses the findings presented in the previous two chapters, drawing on the insights of both Giddens and Stones regarding the duality of structure to frame the discussion. This discussion explores how aspects of the managers' internal knowledgeability combine with aspects of their structural context of action to inform their use of accounting information during NPD.

Chapter Eight provides a summary of the study and presents its conclusions. The findings provide insights into the formal NPD process, the various ways in which accounting information is used throughout this formal NPD process and the impact of

the decentralisation of accounting information on the key participants in the NPD process. The study also enhances our understanding of Structuration Theory, particularly the complexity associated with the varying degrees of autonomy inherent in external structures as well as the interactive and overlapping nature of all structures, both internal and external. Chapter Eight also considers the limitations of the study and provides some suggestions for future research in the area.

1.7 CONCLUSION

This chapter introduced the study. It began by discussing the broader concept of innovation, first examining it from an economic perspective before outlining some of the key issues associated with innovation from an organisational perspective. It then focused more specifically on NPD and the challenges associated with the role of the accountant in the NPD process. These issues are explored in more detail in Chapter Two which presents the study's literature review.

Chapter Two

Literature Review

2.1 INTRODUCTION

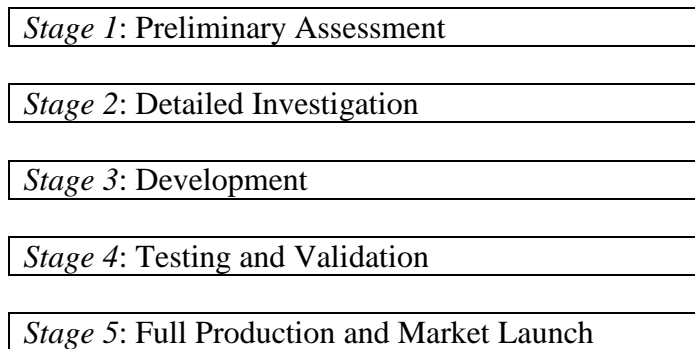
The purpose of Chapter Two is to provide a review of the literature examining NPD, and more importantly, the role of accounting information in NPD. Section 2.2 describes the various stages involved in developing new products before highlighting three factors commonly associated with high quality NPD projects: concurrent new product development, stage-gate control and cross-functional collaboration. The literature examining accounting information and NPD falls into two main categories. The first is the normative literature, which discusses how accounting information or the Finance function ought to be integrated into NPD. This is reviewed in Section 2.3. The second is the empirical literature which reports on the findings of those studies that have examined the role of accounting information or the Finance function in NPD or R&D environments. This is reviewed in Section 2.4. Given the lack of empirical evidence examining the role of accounting information in NPD, it is necessary to draw from more general literature on the broader role of management accountants. The wider management accounting literature suggests that the role of the management accountant is evolving from that of a bean-counter to a business partner. Section 2.5 examines these changes, exploring the management accountant's new business-oriented role and the implications this might have in terms of their contribution to NPD. Section 2.6 concludes the chapter.

2.2 AN OVERVIEW OF THE NEW PRODUCT DEVELOPMENT PROCESS

A high quality NPD process incorporates all of those steps and activities necessary to complete a new product project from idea to launch. Each stage of NPD is marked by clear decision-making requirements whereby management must decide on the future of the project, and each of these decisions is affected by uncertainty and changing information (Buyukozkan and Feyzioglu, 2004). The successful management of this uncertainty is closely associated with NPD project success (Hillson, 2002).

Numerous models for managing NPD have been suggested, most of which are very similar in approach (O'Connor, 1994; Veryzer, 1998). Cooper (1990, 1996) breaks the NPD process into five discrete stages, as indicated in Figure 2.1.

Figure 2.1: New product development process



Cooper (1996) p. 479

This is a generic model showing five identifiable stages, which may overlap or collide. Though described in a linear fashion, this process is iterative and overlapping (Davila, 2000). Other models presented in the literature show anything from five to eight (Rochford, 1991) stages, but the basic progression throughout the NPD process is similar in all models (Ulrich and Eppinger, 2000).

2.2.1 Preliminary assessment

During preliminary assessment, the NPD project is scoped and initial market, technical and business assessments of the proposed new product are carried out (Cooper, 1996). Preliminary assessment should be used to work on the early reduction of market uncertainties, which are best eliminated by intensive initial planning (Verworn, Herstatt and Nagahira, 2008), frequent contact with customers (Herstatt, Stockstrom, Nagahira and Takahashi, 2006) and a strong awareness of the product's competitors (Porter 1980, 1985; Lansiti, 1995, Wind and Mahajan, 1997). Poor execution of this early, 'fuzzy' stage of NPD will result in the project team not knowing what customers want, what competitors are doing, what product and process technologies to use and, ultimately, what business opportunities to pursue (Zhang and Doll, 2001, p. 95).

2.2.2 Detailed investigation

Detailed investigation generally involves the development of a comprehensive business case, incorporating extensive market research, detailed technical and manufacturing feasibility analyses and detailed financial and business analyses (Cooper, 1996). At this point a decision is taken as to whether or not to further invest in designing the product (Cooper, 1990). Poor execution of this stage may result in the waste of time and money through the wrong products being designed (Zhang and Doll, 2001).

Often the distinction between new product successes and new product failures resides in the quality of the pre-development activities of ‘preliminary assessment’ and ‘detailed investigation’ (Cooper and Kleinshmidt, 1995). A comprehensive product strategy, with clearly identified customer needs, a well-defined product concept and a detailed product plan, all of which must fit in with the organisation’s overall corporate strategy, are key contributors to new product success (Khurani and Rosenthal, 1997).

2.2.3 Development

If, after all of this, the project is deemed viable, the new product design is formalised. This product design will identify the features that will make the product competitive and will determine a significant proportion of the product’s costs, which will heavily influence future profit margins (Davila and Wouters, 2004).

There is an increasing focus on the relationship between cost and the design of products prior to production (Hertenstein and Platt, 1997; Hertenstein and Platt, 2000; Hertenstein, Platt and Veryzer, 2005). It has been suggested that 75% to 90% of a product’s costs are determined not during production but on the completion of product design (Berliner and Brimson, 1988; Shields and Young, 1991). It is far easier to manage costs during development, while the design is still susceptible to modification (Ulrich and Eppinger, 2000). Cost reduction opportunities that are missed during development are often more difficult and more expensive to pursue during manufacture (Davila and Wouters, 2004). These trends have brought about an acute

need for coordination between multiple functions in the organisation (Hertenstein and Platt, 1998). For years, the product development stage of NPD has existed as part of a sequential process where product designs were simply ‘thrown over the wall’ to the manufacturing function. The increased importance of ensuring the design is right first time has turned product design into a team effort where contributions are drawn from various functions throughout the organisation (Olson, Walker and Ruekert, 1995, p. 49). As discussed in Chapter One, this involves the use of ‘silent designers’. These are members of departments outside of the core-design function, such as R&D, production, marketing and finance, who can play a critical role in the management of design parameters (Nixon and Innes, 1998).

Once the design is complete, a prototype will be developed and subjected to some in-house testing. In addition, the manufacturing process and manufacturing resource requirements are mapped out, a marketing launch plan is developed and detailed test plans are defined. As resource commitments increase during this phase, the full NPD team becomes involved, including representation from marketing, technical, manufacturing, quality assurance, purchasing, sales and finance (Cooper, 1996).

2.2.4 Testing and validation

During the testing and validation phase, the new product, its production and its marketing and launch plans are verified and validated (Cooper, 1996). Development and testing go hand in hand (Feldman and Page, 1984) and a certain amount of in-house and customer testing will occur during product development (Cooper, 1996, 1998), but extensive in-house testing, customer trials and test marketing occurs after the final product and product features have been developed (Cooper, 1996). The objective of this stage is to deliver a fully-tested product that is ready for commercialisation (Cooper, 1996).

2.2.5 Full production and market launch

The final stage involves full production and commercial selling of the product. In this stage, the marketing and production plans are implemented and post-launch activities are monitored and adjusted if necessary. This is the point at which it begins to emerge whether or not an NPD project has crystallised into a superior product in the eyes of the consumer (Langerak, Hultink and Robben, 2004).

During each stage, vital information is gathered before moving onto the next one. This is done in order to reduce technical and business uncertainties as the NPD project progresses. Uncertainty is also managed by adopting a truly cross-functional team approach (Cooper, 1996). Traditionally, R&D and NPD activities were carried out by specialised personnel in isolated laboratories. NPD has now become a company-wide endeavour in which everyone in the value chain collaborates to shorten development times, lower risks and uncertainties and reduce costs (Saad and Erickson, 1991; Katzenbach and Smith, 1993; Bowen *et al*, 1994).

2.2.6 New product development - quality of execution

Using a disciplined approach to NPD, increases information utilisation and the effectiveness of decision-making, both of which should contribute to product success (Cooper, 1999). Quality of the execution of each stage, particularly the pre-development stages such as ‘preliminary assessment’ and ‘detailed investigation’, has been closely associated with strong new product performance (Cooper, 1988). Smith and Reinerstein (1991) popularised the term ‘fuzzy front end’ to describe these early phases of NPD (Verworn *et al*, 2008). It is suggested that more time and resources dedicated to these early ‘fuzzy’ stages of NPD which precede actual product development will contribute directly to new product success (Booz, Allen and Hamilton, 1982; Cooper, 1988; Hise, O’Neal, McNeal and Parasuraman, 1989; McGuinness and Conway, 1989; Dwyer and Mellor, 1991; Atuahene-Gima, 1995; Shenhar, Tisher, Dvir, Lipovetsky and Lechler, 2002).

Prior to the 1960s, NPD was considered to be a linear process, the success of which appeared to be driven only by technology and R&D (Poolton and Barclay, 1998). Subsequently, it became clear that more factors played a role, in particular the concept of accurately identifying customer needs. Consumer focus is now a key aspect of NPD (Cooper and Kleinschmidt, 1987). Regardless of the technology being used, a product must be perceived to deliver value to customers and consequently consumer needs must be taken into account from very early on in the process (Browne and Eisenhardt, 1995). Again, this emphasises the importance of the early stages of the NPD process (Cooper, 1988, Hise *et al*, 1989).

Cooper highlights the importance of incorporating adequate control measures into the NPD process. Cooper (1990) introduced the concept of the 'stage-gate system' in which process management methodologies are applied to innovation. According to this theory, the NPD process is sub-divided into several stages or work stations between which there is a quality control checkpoint or 'gate'. Each gate is characterised by a set of deliverables upon which that particular stage of the project will be judged. Typically, a Go/No Go approval is required at each of these stages. A stage-gate system is best supported by parallel processing or CNPD because at each stage many NPD activities are taking place concurrently, involving several different functions of the organisation. The gates are generally supervised by a 'gatekeeper', who is a member of senior management with sufficient authority to make decisions and approve resources. A successful stage-gate system requires a cross-functional team approach, a committed and capable project team leader dedicated exclusively to the progress of the project, and commitment by top management to the NPD process (Cooper, 1990).

As referred to in Chapter One, a cross-functional approach to NPD is believed to shorten development times, lower risks and uncertainties, and reduce costs (Saad and Erickson, 1991; Katzenbach and Smith, 1993). The combination of individuals with different expertise allows the team to tap into a broad range of external information and knowledge, facilitating creativity and innovative thought (Bowen *et al*, 1994). Such collaboration between different team members requires vigorous communication and the early involvement of all elements of the enterprise in the NPD process (Haque, Pawar and Barson, 2000).

2.3 ACCOUNTING AND NEW PRODUCT DEVELOPMENT – A NORMATIVE VIEW

Much of the literature examining the relationship between accounting and NPD is normative in nature. In other words it suggests how the Finance function should contribute to NPD, how contemporary accounting tools and techniques should support them in this regard and, as a result, how accounting information should be integrated into every step of the NPD process. This literature is reviewed below.

2.3.1 The Finance function and new product development

Despite the increasingly cross-functional approach to NPD, the relationship between the Finance function and the rest of the NPD team has been traditionally adversarial, often leaving the financial perspective to be provided by numerically astute engineers and designers (Clark and Fujimoto, 1991). The general NPD literature has rarely attached the same importance to the Finance function as it does to other team members such as those from R&D, Design, Engineering, Manufacturing and Marketing (Paddison and Merchant, 1987; Finiw, 1992; Faust, 1993; Katzenbach and Smith, 1993; Bowen *et al*, 1994; Deschamps and Nayak, 1995). Bobrow and Shafer (1987) found that members of the Finance function conflict with more creative members of the NPD team such as product designers and marketers. Nixon (1998) blames this conflict on long-running tensions between accountants who argue using numbers and designers and engineers who argue using taste and instinct. The following quote from Robert McNamara, Head of Finance in Ford during the 1950s, characterises the traditional adversarial relationship between accounting and other NPD participants:

Whatever the product men and the manufacturing men want, deny it. Make them sweat and then make them present it again and once again delay it as long as possible... That way they will always be on the defensive and will think twice about asking for anything (Halberstam, 1987, pp.237).

However, it is widely acknowledged that the general role of the Finance function is changing from that of a scorekeeper to one of trusted advisor to the management team (Siegel and Kulesza, 1994; Burns, Ezzamel & Scapens, 1999; Siegel and Sorensen, 1999; Burns and Yasdifar, 2001). As organisations have been affected by

characteristic business trends such as increased competitiveness, a greater degree of customer orientation and the proliferation of sophisticated information technologies throughout the entire organisation, managers are utilising more accounting information but fewer accountants (Scapens, Turley, Burns, Joseph, Lewis and Southworth, 1996; Pierce, 2001). This decentralisation of accounting information means that accounting calculations, analyses and computations may indeed be just as easily carried out by engineers, designers and managers as by the Finance function. As a result, instead of gathering and distributing accounting information, members of the Finance function are now expected to use their freed-up time to analyse and interpret this information, necessitating a stronger commercial awareness and understanding of business processes (Hertenstein and Platt, 2000).

2.3.2 Contemporary management accounting tools and techniques

It was suggested in the literature of the 1980s that ‘traditional’ management accounting techniques had lost relevance in light of the changing business environment (Johnson and Kaplan, 1987). In response, several ‘new’ techniques were presented which were intended to restore the relevance of management accounting. Many of these techniques have a particular resonance in a R&D or NPD environment.

2.3.2.1 Strategic management accounting

Strategic Management Accounting (SMA) is an all-encompassing term which describes the provision of information to managers to assist in the formulation and implementation of the organisation’s strategy. SMA is difficult to define and may mean different things to different organisations but ultimately it involves an extension of the internal focus of traditional management accounting to include external, customer driven information. It focuses on gaining competitive advantage by decreasing costs and exploiting competitive advantage throughout the entire value chain, and it links the strategic positioning of the firm with its management accounting information system (Drury, 2004).

The literature surrounding SMA is somewhat disjointed (Coad, 1996). SMA was initially introduced by Simmonds (1982) as a means of ascertaining the relative competitive position of a company within its industry. This view of SMA involves collecting and analysing data on costs, process, sales volumes, market shares, cash-flows and resource utilisation for the company and its competitors. SMA, from this perspective, is characteristically externally focused.

An alternative perspective is offered by Shank (1989) and Shank and Govindarajan (1992, 1993), who were heavily influenced by Porter's (1998) work on value chain analysis. They suggest that the function of SMA is to provide cost information to the four stages of strategic management, i.e. strategy formulation, strategy communication, strategy implementation and strategic control. Focusing on three key themes, i.e. value chain analysis, strategic positioning analysis and cost driver analysis. This approach to SMA, known as Strategic Cost Management (SCM), concentrates on the relationship between strategy and management accounting (Shank, 1989). The SCM approach contains three components which, when combined, represent a powerful method of focusing a cost analysis from a strategic perspective. The three components of SCM are (i) value chain analysis; (ii) cost driver analysis, and (iii) competitive advantage analysis. Value chain analysis analyses the costs of activities from basic raw materials through to end product delivery. It requires a broad, external focus and recognises that the value of a product is not generated exclusively within the organisation. Cost driver analysis recognises the wide variety of activities which drive the organisation's costs and encourages the organisation to develop a deep understanding of the actual working of the organisation. Competitive advantage analysis requires a deep understanding of the implications of how an organisation competes, i.e. low cost strategy, or a differentiation strategy, etc. This SCM approach represents a structural approach to assessing the strategic implications of an investment (Shank, 1996). More realistically, a combination of old and new is suggested (Carr and Tomkins, 1996). Shank (1996) suggests that financial analysis alone can be misleading yet Carr and Tomkins (1996) believe that a good strategic analysis is usually guided by a strong financial basis. Information which is already used to make capital investment decisions in an unstructured, informal, qualitative way should be incorporated into the structured, formal decision process (Nixon,

1995). A more appropriate result is likely to emerge from a compromise between intuition and analysis (Carr and Tomkins, 1996).

Much of the early SMA literature which followed Simmonds' and Shanks' initial introductions took quite a normative perspective, prescribing various methodologies and techniques thought to be superior to traditional forms of management accounting (Bromwich, 1990; Dermer, 1990; Kaplan, Shank, Horngren, Boer, Ferrera and Robinson, 1992; Nanni, Dixon and Vollmann, 1992; Palmer, 1992; Foster and Gupta, 1994; Roslender, 1995; Guilding, 1999). Empirical evidence, however, suggests low adoption rates of these SMA techniques (Langfield-Smith, 2008; Seal, 2010). Lord (1996) was amongst the first to question the efficacy of SMA techniques, suggesting that this type of information may not be quantifiable in accounting figures and may not be collected and used by management accountants. This is despite what appears to be a sustained growth in the number of concepts, models, tools, academic and professional journals and consultancy practices within the SMA domain. Nixon and Burns (2012) refer to this as the 'paradox of SMA'; the apparently low adoption rates of SMA techniques, alongside a seemingly more intensified demand for more strategically relevant information.

More recent SMA literature reports large variations in the form and nature of SMA processes used in organisations (Bhimani and Langfield-Smith, 2007; Chenhall and Langfield-Smith, 2007). Langfield-Smith (2008) found that SMA techniques were not widely adopted nor was the term SMA widely understood, but certain aspects of SMA were found to influence the thinking and language of business in a wider context. A move beyond the specific terminology reveals that the principles and philosophies underlying SMA have permeated the organisation in more subtle ways, informing wider organisational practices and processes. Anderson (2007) suggests that the true success of SMA is in the extent to which it has permeated research and teaching across a range of management disciplines. The real research agenda in this area is the need to explore how SMA techniques diffuse into more general organisational practices (Langfield-Smith, 2008) and this will require the use of a multi-disciplinary research approach (Nixon and Burns, 2012).

2.3.2.2 Lifecycle costing

Capturing accurate costs through the entire product lifecycle requires a company to incorporate the principles of lifecycle costing, an approach which involves the collation and analysis of all costs attributable to a product from conception through to delivery to customers (Shields and Young, 1991). As opposed to capturing costs on an annual basis, the time frame in lifecycle costing depends on the length of the stages in a product's life (Guilding, Craven and Tayles, 2000). Lifecycle costs for a manufacturer includes planning, design, testing, production, marketing, distribution, administration, service and warranty costs. The particular benefit of lifecycle costing in an NPD context is that it captures those costs incurred at the early stages of a products lifecycle, such as planning and design, which, while fuzzier in nature, comprise a huge proportion of the products total costs (Dunk, 2004). Two alternative methodologies of capturing and controlling costs incurred during design are presented below. The Japanese approach strictly controls the mix of products manufactured and sold as well as the costs of these products through the use of target costing, value engineering and kaizen costing. The US approach focuses on responding to customer demand whilst ensuring to retain profitability through the application of Activity Based Cost Management (ABCM).

2.3.2.3 Target costing, kaizen costing and value engineering

Target costing is a highly disciplined, profit management technique whereby the company establishes a product's target selling price in the market, sets a profit margin consistent with the company's financial objectives and from there computes an allowable target product cost (Cooper and Slagmulder, 1999). As a discipline, target costing harmonises the efforts of disparate NPD team participants, designers, marketers, manufacturers, suppliers and even accountants (Cooper and Chew, 1996). Target costing is best supported by a process of value engineering, the aim of which is to produce the optimum product possible within the parameters of the target cost. It controls the number of product line extensions and attempts to respond as closely as possibly to customer needs without exceeding the target cost. Kaizen costing, kaizen meaning continuous improvement, occurs after target costing. It recognises that prices fall over time and focuses on reducing target costs by a pre-specified amount without

compromising design and reliability standards. The Japanese approach stresses control. By delivering precisely what the customer wants and minimising line extensions and additional features, the Japanese are able to compete favourably on price. However, this approach is extremely reliant on high quality market research and can often be blind to emerging market trends (Rabino, 2001).

2.3.2.4 Activity based cost management

ABCM is based on the principles of Activity Based Costing (ABC) which allows managers to attribute costs to activities and products more accurately than traditional cost accounting methods. Different products and customers place varying demands on the company's resources. ABC involves reviewing historical data while ABCM is a future oriented cost management system. From an NPD perspective, ABCM helps managers to identify those products and customers where improvements might have the best financial impact. The US approach is less about cost control, and more about responding to customers' needs but doing so with a sound understanding of the costs and benefits associated with different products (Rabino, 2001).

Regardless of the approach adopted, these techniques support accurate costing during product design and development by determining, evaluating and appraising different design options (Nixon and Innes, 1997). Target costing techniques may even be initiated prior to product design and development, during detailed investigation in order to support forecast calculations (Boer and Ettl, 1999). As the NPD team try to achieve an appropriate balance between cost and product characteristics such as quality, appearance and manufacturability, these techniques provide a wider perspective by providing information not only on costs, but on the activities driving costs, cost complexity, indirect costs and the relationship between costs and processes (Hertenstein and Platt, 1998).

2.3.2.5 Total quality management

In the late 1970s it became apparent that Japanese manufacturers could sell products which performed better, had fewer defects and cost less than US manufacturers. An emphasis on quality in its manufacturing process had turned Japan into an economic

powerhouse. In an attempt to win back market share from the savvy Japanese and in response to increasingly sophisticated and knowledgeable consumers demanding a larger choice of high quality, affordable products the rest of the world has followed the Japanese lead. They have begun ‘designing in’ quality at the beginning of the product development process as opposed to ‘inspecting in’ quality at the end of the product line (Blocher, Stout, Cokins and Lin, 2005).

Total Quality Management (TQM) is a holistic approach which recognises that all of the activities in a company’s supply chain affects the quality of the company’s product or service. Customer requirements are addressed at each stage of the organisation’s supply chain and the aim is to maximise customer satisfaction, while maintaining rigorous cost control (Albright and Lam, 2006). Quality is built into the product from the very beginning of the NPD project and this is the responsibility of everyone in the organisation (Blocher *et al*, 2005). TQM is closely related to other techniques discussed earlier such as target costing, value engineering and ABCM and represents another opportunity to fully integrate the accountant into the NPD process as early as possible. Blocher *et al* (2005) identified the following activities which the accountant can carry out in a TQM context.

Table 2.1: The Role of the management accountant in TQM

1. Ensure full representations of management accountants on the main quality control committees and quality improvement teams.
2. Make the customer fully aware of the competitive benchmarks, competitive gaps, customers’ retention rates, and costs of quality.
3. Participate actively in identifying areas of greatest quality improvement opportunities and needs.
4. Develop quality measures to monitor and assess ongoing progress towards quality goals.
5. Be involved closely in vendor-rating decisions.
6. Review and evaluate quality control effectiveness and the value of training courses for quality control personnel and human resources staff.
7. Gather and continually review scrap and recovery costs.

Source: Blocher *et al* (2005, pp.2)

2.3.26 The balanced scorecard

In response to the inadequacy of traditional financial performance measures in today’s business environment (Banks and Wheelwright, 1979; Hayes and Abernathy, 1980),

Kaplan and Norton (1992, 1993, 1996) have introduced the Balanced Scorecard (BS) as a means of providing a balanced presentation of both financial and operational measures. The BS recognises that no single set of measures can adequately encapsulate the company's overall performance and instead presents four alternative views- the financial perspective, the customer perspective, the internal perspective and the innovation and learning perspective.

The BS limits the number of measures being used, minimising information overload and forcing managers to focus on the critical issues. It presents a single, holistic view of the company and allows managers to assess the overall impact of a decision or occurrence. From an NPD perspective it offers several advantages. It transcends traditional functional boundaries, encouraging cross-functional team-work and communication. It is externally aware, forward thinking and critically, it recognises that companies must innovate to grow. Sandstrom and Toivanen (2002) studied the extent to which the BS could be used to connect development and design engineers in NPD projects to the economic objectives of the company and they found that the BS's particular strength from an innovative perspective was its 'ability to transfer company goals to the operational levels of the organisation' (pp.82). They reported that designers view the BS as a 'support' as opposed to a 'control' and that particular benefits could be achieved by incorporating designers into discussion around the development and subsequent review of performance measurements. In addition, its future orientation, its clearness and its ability to incorporate several different perspectives were all highlighted as particular advantages of having a BS in a company engaging in NPD (Sandstrom and Toivanen, 2002).

2.3.3 Accounting information and new product development

New product success is dependent on delivery of a unique and superior product, which today equates to delivering the maximum cost benefit to the customer (Montoya-Weiss and Calantone, 1994). NPD team members need to be constantly reminded that the financial success of the product is the goal and that, ultimately, the NPD process must reflect this (Hertenstein and Platt, 1998). In this sense, it is suggested that accounting information is relied upon to facilitate the ongoing

cost/benefit dialogue between designers and senior management (Nixon and Innes, 1998). Nixon and Innes (1998) suggest that it is used to continuously update senior management on the resources required to develop the new product, as well as on the value of the work completed, particularly the less tangible and more innovative aspects of the NPD project. In addition it is thought that accounting information explains the risks and financial implications of decisions made throughout the project, as well as make explicit the unspoken corporate knowledge which often exists at the 'fuzzy front end of NPD' (Nixon and Innes, 1997).

Successful projects, therefore, are thought to be those in which each stage of the process is backed up by solid accounting information (Edgett, 1994). The NPD and accounting literature outlines numerous ways in which accounting information ought to be integrated into each stage of the NPD process.

The literature highlights the importance of developing a product which accurately responds to the consumer's needs (Cooper and Kleinschmidt, 1986; Cooper, 1988; Hise *et al*, 1989), but the decision as to whether or not to introduce a new product, or to extend an existing product line, must ultimately be based on that product's potential to earn revenues in excess of its production costs (Rabino, 2001). Therefore, during the preliminary assessment stage of NPD, an assessment of the estimated revenues and costs, cost volume profit (CVP) calculations and breakeven analyses is essential to making new product decisions, even at this early stage (Jaedicke and Robichek, 1965; Griffin and Page, 1993; Rabino, 2001). SMA techniques can then be used to increase the link between accounting information and corporate goals (Hiromoto, 1988) and to facilitate a more flexible and externally focused approach to the collation, analysis and presentation of data (Foster and Gupta, 1994).

It is typically during the detailed investigation stage that new product plans are made and the objectives and targets are finalised against which the product's eventual market performance will be assessed (Page, 1993). Accounting information during this stage has traditionally provided managers with a detailed financial assessment of the proposed project, including anticipated return on investment (ROI), payback, discounted cash flows (DCF) and detailed profitability analyses (Cooper and Kleinschmidt, 1986; Davis, 1993 Montoya Weis and Calantone, 1994). Some

criticism has been levelled at the way in which these traditional approaches appraise proposed investments (Ashford, Dyson and Hodges, 1988; Accola, 1994; Nixon, 1995; Sillince and Sykes, 1995). Consequently, techniques such as SCM have been put forward, which suggest a more qualitative view by assessing an investment as much on 'strategic' grounds as on its ability to overcome frequent financial hurdles (Slagmulder, Bruggerman and Wassenhove, 1995).

Accounting information is critically important during the development stage of NPD (Hertenstein and Platt, 1998). Given the large proportion of product costs which are determined on the completion of product design rather than during production (Berliner and Brimson, 1988; Shields and Young, 1991), together with the prohibitive expense of making changes to the product design once the design is complete (Ulrich and Eppinger, 2000; Davila and Wouters, 2004), it is critical that cost management commences at the design phase of NPD if costs are to be effectively controlled throughout a product's lifecycle. Traditional cost management techniques, such as standard costing and variance analysis, have focused on cost control during the production stage. More contemporary costing approaches, such as lifecycle costing, target costing and ABCM, recognise the importance of capturing accurate costs during the 'design' phase of NPD and reflect the increased role played by the market in setting a company's cost parameters.

To support the testing and validation of new products, at the very least, a range of financial and non-financial measures of quality performance must be provided to management in order to support the management of quality costs as early as possible in the NPD process (Anderson and Sedatole, 1998). TQM recognises that all of the activities carried out in a company's supply chain affect the quality of that company's product or service and represents another opportunity to fully integrate accounting information into the NPD process as early as possible (Blocher, Stout and Cokins, 2010).

The full production and product launch phase is the point at which the new product idea crystallises into a marketable product. Managers require an indication of the new product's performance as early as possible (Huang, Soutar and Brown, 2004). The measurement of new product success is considered extremely important though it is complicated both by its multi-dimensional nature (Cooper and Kleinschmidt, 1995; Hultink and Robben. 1995) and by NPD's multiple stakeholders all having varying perspectives on what constitutes NPD success (Lipovestsky, Tishler, Dvir and Shenhar, 1997). Traditional analyses focus on sales, margins and ROI (Mahajan and Wind, 1992; Page, 1993; Hertenstein and Platt, 1998). However, managers face conflicting demands in terms of being exposed both to traditional budgetary controls which measure the product's progress against predetermined targets, and to the broad-based demands of responding to market needs. The BS system has been put forward as a performance measurement tool which addresses the weaknesses of traditional performance measurement techniques in an NPD context (Sandstrom and Toivanen, 2002).

In addition to tracking the cost, value, cash flow and risk implications of decisions taken within each phase of NPD (Rabino, 2001), accounting information is thought to provide an effective integrating vernacular which assists NPD collaboration and balances tensions between various NPD stakeholders, such as customers, designers, developers, suppliers, operators, financiers and senior management, by translating everything back into a single financial language (Nixon and Innes, 1997).

2.4 ACCOUNTING AND NEW PRODUCT DEVELOPMENT – AN EMPIRICAL REVIEW

Much of the literature relating to accounting information and NPD consists of largely normative assertions suggesting how accounting information ought to contribute to NPD and the role the Finance function ought to play in facilitating this. Empirical reviews testing these assertions are limited and are largely restricted to examinations of the role of the Finance function in an R&D or NPD environment.

Rabino (2001) reports that NPD team members require comprehensive product costing data which incorporate market and competitor intelligence and facilitate informed strategic new product decision making. He suggests that the best way of achieving this is to integrate the Finance function into the NPD process as early as possible. Yet his findings rank the accountant as the least important functional member of the NPD team and the most likely team member to be overlooked. Hughes and Pierce (2006) report that the Finance function occupies a largely ancillary role assisting the NPD Team with mainly costing information and feasibility analysis. Their role remains limited, due largely to the strong financial know-how of other NPD team members and the late stage at which the Finance function is typically integrated into the process. Hughes and Pierce (2006) suggest that an increase in the Finance function's contribution to NPD is certainly possible, but only if its members learn to provide broader and more responsive information that meets the conflicting demands of the disparate NPD team members. Trueman and Pike (2006) report that less than half of the accountants they interviewed had significant involvement with designers during NPD, though most had informal contact with some NPD team members during new projects.

In contrast, Gleadle's (1999) case study of 3M (UK) reveals a highly evolved Finance function which successfully integrates financial and non-financial information in such a way as to encourage innovation and NPD, while simultaneously exercising sufficient financial control to meet stakeholder objectives. 3M (UK) is characterised by a high level of financial literacy throughout the organisation, a dedicated financial analyst within each NPD team and very few financial controls over NPD. 3M (UK) was also found to frequently adopt the 'spirit of new techniques' (p.25), such as

lifecycle costing or ABCM, while rejecting the formal labels and cumbersome processes associated with them. The company has also been known to adopt the more useful aspects of 'new' accounting tools and techniques as opposed to engaging in the lengthy procedure of integrating them fully into the accounting system. This reflects similar findings reported in wider accounting literature regarding the growing tendency for aspects of new techniques to be used to supplement existing techniques (Pierce and O'Dea, 1998).

Nixon (1998) also reveals the existence of very proactive accounting support for NPD. Accounting information is considered critical to design choice in contributing to the reconciliation between customer requirements and the company's contribution and cash flow needs. It also is deemed essential to communicating clear goals, metrics and milestones throughout the NPD team, integrating the disparate perspectives of the various NPD stakeholders. Nixon's case company reflects a cross-functional approach to the NPD process, during which formal measurement of the contribution of individual functions to NPD is avoided. Nixon's (1998) revelation of proactive accounting support for NPD is attributed largely to the range of accounting techniques now available which can support the NPD process from design to marketing and after-sales service. SMA techniques such as strategic cost management and strategic capital investment appraisal, lifecycle costing, target costing and value engineering have all been identified in the literature as key tools which structure and articulate critical dialogue among NPD team members in an effort to achieve both technical and financial goals (2.3.3). Nixon (1998) describes these findings as contrasting with the traditional view of the role of accounting information in NPD, suggesting that this is as much due to the collaboration which the techniques require and the extent of engagement they facilitate among NPD team members as it is to the techniques themselves.

Hertenstein and Platt (1998) describe the Finance function as playing a similarly significant role in NPD. The many tasks carried out by the Finance function include: assessing the financial feasibility of the product; preparing projections, product-cost estimates and investment appraisals; developing detailed capital proposals; facilitating ongoing cost/benefit dialogue between the new product team and senior management; and monitoring progress against target costs.

Empirical evidence on the role of the Finance function and the integration of accounting information in NPD is limited and that which does exist does not provide a clear and comprehensive representation of the role of accounting information in NPD. Findings seem to vary significantly from company to company, suggesting that the role of accounting information in NPD is not homogenous to all organisations and may be influenced by particular aspects of the organisation, the Finance function or the specific project.

It can be speculated that the role of accounting information in NPD in any organisation is influenced by the role of the Finance function in that organisation. Much has been made in the literature of the ongoing transformation of the management accountant's role from a number crunching bean-counter to a financially astute business partner. The business role is described in terms of a management accountant who demonstrates commercial awareness and business focus (Burns and Balvinsdottir, 2005) as well as a cross-functional perspective (Burns and Scapens, 2000), all traits sought after in accountants working in an NPD context (Hughes and Pierce, 2006). The next section discusses this transformation in more detail and sets out the possible implications of this for the development of new products.

2.5 THE CHANGING ROLE OF THE FINANCE FUNCTION

The business environment has altered significantly over the past three decades.³ Rapid globalisation resulting in increased competitiveness (Burns *et al*, 1999), scientific and technical advancement bringing about changes in information technologies (IT) as well as production and logistics technologies (Burns and Yazdifar, 2001) and widespread organisational restructuring as firms rush to downsize, delayer and outsource (Ezzamel, Lilley and Wilmott, 1994) have all led to an increasingly turbulent and uncertain business environment (Otley, 1994). These trends are thought to have encouraged significant changes in management accounting in terms of the development of new accounting techniques and systems (Pierce and O'Dea, 1998)

³ This refers primarily to the period from 1980 to date.

together with a transformation in the role performed by the Finance function (Burns and Yazdifar, 2001; Scapens *et al*, 2003).

Johnson and Kaplan (1987) presented a ‘relevance lost’ argument that articulated concerns regarding the continued relevance of management accounting techniques in light of these changes in the business environment. This prompted a decade of criticisms being levelled at the management accounting profession coupled with suggestions for improvement. This period saw the emergence in the literature of a variety of contemporary management accounting techniques discussed in Section 2.3.2.

The development of these new and progressive accounting techniques was coupled with calls for a move away from the traditional number crunching role of the accountant to that of a more strategically focused financial advisor (Byrne and Pierce, 2007). There were increasing calls in the literature for the Finance function to balance the role of controlling the organisation’s financial interests with that of effectively advising and helping managers to run the business (Burns and Scapens, 2000). The term ‘hybrid accountant’ (Burns *et al*, 1999) was coined to encapsulate this dual role, and to perform it effectively accountants were required to develop a stronger understanding of the complexities of the business and to increase their interaction with people throughout the organisation (Burns and Scapens, 2000).

A number of studies have examined the extent to which changes in the accountant’s role have matched up to expectations. Several of these studies have indicated a broadening of the accountant’s role together with a growing emphasis on the analytical skills and social competencies of accountants (Siegel and Sorensen, 1999; Burns and Yazdifar, 2001; Yazdifar and Tsamenyi, 2005; Byrne and Pierce, 2007; Järvenpää, 2007; Bhimani and Bromwich, 2010). Some suggest that accountants are still heavily relied upon for scorekeeping and internally oriented activities (Burns and Vaivio, 2001; Verstegen, De Loo, Mol, Slagter and Geerkens, 2007; Zoni and Merchant, 2007). Caglio (2003), Burns and Balvinsdottir (2005) and De Loo, Verstegen and Swagerman (2011) uncovered evidence of the existence of a ‘hybrid’ accountant who demonstrates an increased involvement in business processes combined with a more traditional monitoring and control role.

However, the literature does not provide a consistent picture of the contemporary accountant. It has been suggested that the accountant's role varies from organisation to organisation and that it is influenced by a variety of contextual factors, some pertaining to the specific organisation, some pertaining to the management team and some pertaining to the accountants themselves (Gerdin and Greve, 2004; Feeney, 2006; Byrne and Pierce, 2007). This introduces the concept of contingency theory to the study of accounting information.

2.5.1 A contingent perspective

Contingency theories surfaced in organisational theory literature in the mid-1960s but did not appear in the management accounting literature until the mid-1970s. The contingent approach to management accounting is based on the premise that:

... there is no universally appropriate accounting system which applies equally to all organisations in all circumstances, the choice of appropriate accounting systems depends on the specific circumstances in which an organisation finds itself (Otley, 1980, pp.84).

There is a body of literature studying the effectiveness of Management Accounting Systems (MAS) in light of structure, technology, strategy, uncertainty, environment and culture. Horngren (1972) recognises the interdependence between MAS design and organisational structure. Dermer (1977) describes the design of control systems as being necessarily 'situationally specific'. Piper (1978) and Daft and MacIntosh (1978) cite technological development as a key contingent variable affecting the design of MAS. Hopwood (1972) and Otley (1978) assert that organisational structure has an important effect upon the way in which a management accounting system functions. Khandwalla (1972) finds that different levels of competition have different impacts on the use of accounting controls in an organisation. The findings of Otley (1978) suggest that the competitive intensity of the environment in which organisations operates strongly affects the way in which managers use budgetary information and Chenhall and Morris (1986) report on the effects of perceived uncertainty on information systems design.

In the 1980s, strategy began to emerge as a key contingent variable upon which management control systems should be based (Govindarajan and Gupta, 1985; Merchant, 1985; Simons, 1987). It has been established that management control systems which have been developed in a traditional context are not sufficiently broad to apply in a contemporary business environment (Otley, 1980; Otley *et al*, 1991; Otley, 1994; Otley *et al*, 1995). By the late 1980s, the relationship between strategy and management control systems began to emerge as an area which could overcome the inadequacies of traditional theories (Langfield-Smith, 1997). Langfield-Smith's findings provide evidence that management control systems can influence strategy formulation, implementation and change.

Chenhall (2003) suggested that future contingency-based research should focus more on contemporary contingency based factors, particularly those drawn from other theories such as economics, psychology and sociology. Such approaches would begin to focus on interactions between individuals and interactions within groups, all of which might impact the design and function of MAS and consequently the extent of the accountant's role within this MAS.

2.5.2 The decentralisation of accounting information

Empirical evidence suggests that new accounting techniques such as ABC and the BS have not enjoyed widespread implementation (Bright, Davies, Alphaourne and Sweeting, 1992; Drury, Braund, Alphaourne and Tayles, 1993; Innes and Mitchell, 1995; Innes, Mitchell and Sinclair, 2000). In some cases, new techniques are being integrated with traditional techniques, while the information from 'traditional' techniques is being adapted to meet the changing needs of users (Pierce and O'Dea, 1998). Burns *et al* (1999) assert that while MAS and techniques have not changed significantly, the way in which they are used and administered has altered and these changes reflect a wider shift in the process of management. For instance, technological advances mean that information is now so widely dispersed that managers have ready access to the accounting information that was previously provided by the accountant. This has resulted in managers preparing their own budgets, updating their own forecasts and, in some cases, even assessing their own

performance. This reduces the accountant's responsibilities in terms of basic accounting information provision. It is accepted, however, that for information to have any real value it must be presented in a commercial context, mindful of strategic considerations and often expressed in non-financial terms. In this sense, MAS are altering little in terms of the information they produce but it is becoming increasingly necessary to interpret this information in a broader context. Here, according to Burns *et al* (1999), lies the defining characteristic of the accountant's contemporary role:

The ability to place financial numbers in a broader context and relate them to key non-financial measures (p.29).

As set out in this section, empirical studies have reported that managers have expressed a strong desire for the Finance function to add more value, demonstrate more business awareness and become more actively involved in the development and pursuit of competitive strategies. However, there is a dearth of empirical findings examining the role of the Finance function in NPD, which is an area of key strategic significance for most organisations. If managers engaged in NPD are accessing accounting information themselves, as might be the case in light of the findings made in the wider accounting literature outlined above, this raises important questions in terms of what role the Finance function performs in the process, and what impact their involvement, or lack thereof, has on the role of accounting information in NPD.

2.6 CONCLUSION

A firm's innovativeness is executed through its NPD process; this is a systematic way of pushing a new product along from idea to launch. A well-executed NPD process is believed to be truly cross-functional, with multiple participants all having varying perspectives and conflicting interests. It is speculated that accounting information provides an integrating vernacular allowing cross-functional managers to make sense of and discuss issues throughout the NPD process. However, discussions surrounding the role of accounting information in NPD are largely normative and the validity of their benefit claims have not yet been firmly established in the literature. The literature also lacks a strong theoretical foundation making it difficult to achieve a significant depth of insight.

Concerns have been expressed in the wider accounting literature regarding the extent to which accounting information can satisfy managerial needs in a turbulent business environment. There is recognition throughout this literature that the role of accounting information is not homogenous and varies from company to company. Contingency theory has been used to examine the impact of a number of organisational variables on accounting information use. However it is widely accepted that NPD is a cross-functional activity, involving a range of participants with varying interests. It is likely that the role of accounting information varies not just from company to company but from user to user, with the result that the use of accounting information is actually a social phenomenon within an organisation.

Much of the literature examining the role of accounting information has lacked a theoretical foundation or has relied on traditional, functionalist theories. A more critical view could be used to explore how the varying motivations and objectives of different users and groups of users are implicated in accounting information use. This recognition of the social implications of accounting information use requires a theoretical framework which would support the exploration and interpretation of such social phenomenon. Structuration Theory emerged as an appropriate theoretical lens through which to examine the role of accounting in NPD primarily because it places agency and structure, that is people and practice, equally at the centre of the analysis. Structuration Theory is examined in detail in the next chapter.

Chapter Three

Structuration Theory

3.1 INTRODUCTION

A central issue of concern in the social sciences is the distinction between those people with an objective view of the social world and those with a subjective view. The objective perspective maintains that social action is entirely determined by social structures. Conversely, the subjective perspective holds that all social action is voluntary and that social structures are merely a reflection of that action. Of particular relevance to this study is the respective roles played by structure and agency within these opposing perspectives. Those with an objective view consider structure to predominate over agency, while those with a subjective view believe that the agency determines the structure. Structuration Theory proposes a middle ground between these two extremes in which structure and agency are not independent conflicting concepts but rather are a mutually interacting duality. The distinction between the objective and the subjective becomes less clear in Structuration Theory. This mutually interacting duality contains both objective and subjective elements, in that while human agency is entirely subjective, it can create social structures which then become externalised and subject to objective analysis.

Structuration Theory originally emerged from the school of critical research when Anthony Giddens developed the theory in order to explore how power, knowledge and discourse are implicated in social interaction. It has been the subject of numerous texts, countless academic papers and much discourse at a profound theoretical level. This chapter distils this highly theoretical debate by outlining the key principles of Structuration Theory.

Section 3.2 provides an account of Structuration Theory as originally introduced by Anthony Giddens. Section 3.3 discusses the limitations of Giddens' theory. Section 3.4 presents Stones' (2005) strong structuration model, so called because it was intended to address the weaknesses inherent in Giddens' original framework. Section 3.5 examines Stones' strong structuration model in action, with a particular focus on its use in accounting research. Section 3.6 concludes the chapter.

3.2 GIDDENS' STRUCTURATION THEORY

Structuration Theory was originally set out by Anthony Giddens. In his formulation of the theory, Giddens is primarily concerned with understanding the relationships between the activities of knowledgeable agents and the structuring of social systems. A system comprises a set of discernibly similar social practices. A structure refers to the structuring properties that bind these social practices together. An agent is the individual engaged in these social practices, while agency refers to the actions taken by that individual (see Giddens, 1976, 1979, 1984, 1987).

For Giddens, systems are not structures. Rather, he argues that systems have structures which are drawn upon in social interaction. It is through action and interaction that structures themselves are reproduced. This is a key contribution of Giddens' Structuration Theory, the reconceptualisation of the structure-agency dualism as a 'duality of structure'. For Giddens, this duality of structure means that structures are both the medium and the outcome of social interaction (Giddens, 1984, p.25).⁴

3.2.1 Giddens' Structuration Theory: key concepts

Giddens proposes that structuration takes place along three dimensions: signification, legitimation and domination. Human agents draw on their own internal structures of signification to inform their understanding and communicate meaning. Using signification structures, agents draw on interpretive schemes and discursive practices to communicate meaning and understanding. Interpretive schemes are stocks of shared knowledge, accumulated skills and mutual cognitive rules which agents draw on to understand events. Discursive practices consist of speech, writing and other forms of discourse that agents engage in to communicate meaning to others (Giddens, 1984, p. 28).

⁴ A detailed account of the philosophical debate from which structuration theory emerges is presented in Chapter Four: Research Methods and Research Methodology.

Agents then draw on their internal structures of legitimation to define the limits of acceptable conduct and sanction particular behaviours. Legitimation structures consist of the normative rules and moral obligations of a social system. Normative rules consist of the codes or norms of proper conduct, while moral obligations involve the rule-following behaviour of agents (Giddens, 1984, p. 29).

Finally, agents draw on their internal structures of domination to exercise power and exert influence. The capacity to exercise power or domination can be related to asymmetries in the distribution of resources. Giddens distinguishes between two types of resources; Allocative resources which arise from having command over or knowledge of material objects and authoritative resources which arise from having command over or influence on other agents. Both types of resources facilitate the transformative capacity of human action (i.e. power in the broad sense) while at the same time providing the medium for domination (i.e. power in the narrow sense). (Giddens, 1984, p.31).

These three dimensions of social structure are separated for analytical purposes only. In practice they are intrinsically linked:

In any concrete situation of interactions, members of society draw upon these as modalities of production and reproduction, although always as an integrated set rather than three discrete components (Giddens, 1976, p.124).

Signification, legitimation and domination describe the knowledgeability of agents in relation to their social structures. This is distinct from their modalities, which are the media by which agents draw on these structures. As set out in Figure 3.1, agents draw on interpretive schemes to make sense of activities through signification structures. They draw on norms to legitimise their behaviour through legitimation structures and they draw on facility to control allocative or authoritative resources through domination structures. Essentially, structures of signification and legitimation are rules, and structures of domination are resources, which together represent abstract codes or templates that guide agents' social behaviour and can be both enabling and constraining of human action (Conrad, 2005).

Figure 3.1: Structures as employed in social practice

INTERACTION	communication	power	sanction
(MODALITY)	interpretive scheme	facility	norm
STRUCTURE	signification	domination	legitimation

(Giddens, 1979, p.72)

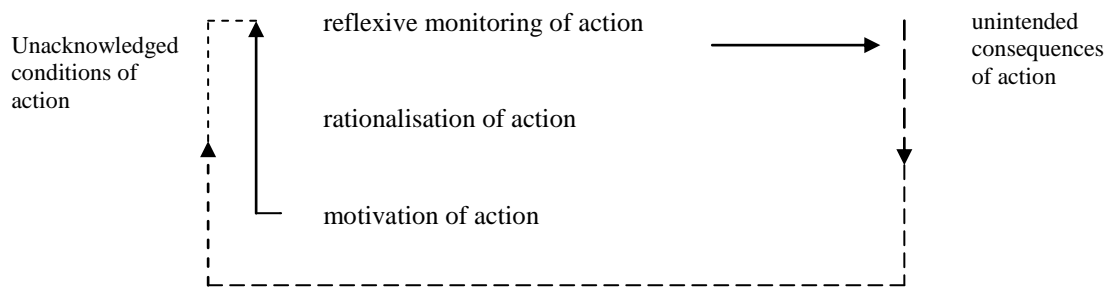
3.2.2 Agents, agency and action

In understanding the link between structures and the agents who reproduce or modify these structures, it is important to recognise the rational and reflective nature of agents. Giddens illustrates this through his stratification model, presented in Figure 3.2 below, in which he explores how individuals examine or reflect on their own conduct. Giddens identifies three elements of action: reflexive monitoring, rationalisation and motivation.

The ‘motivation of action’ refers to the wants or desires of the agent which provide him with the impetus to engage in practices. The ‘rationalisation of action’ refers to the process by which the agent draws on his knowledgeability of social structures. Finally, the ‘reflexive monitoring of action’ refers to the way in which the agent orders and integrates his various practices into more, less or equally important concerns. Together these are the three key elements of any social action.

At the same time, agents often take action while they possess only partial information of the context and outcome of that action. This distinguishes the ‘acknowledged conditions of action’ and the ‘intended consequences of action’ from the ‘unacknowledged conditions of action’ and the ‘unintended consequences of action’. Furthermore, actions may have unintended consequences which feed back into the unacknowledged conditions of further actions (Giddens, 1984, pp.1-4).

Figure 3.2: Giddens' stratification model of the agent



(Giddens, 1984, p.5)

This model illustrates the highly autonomous nature of agents. There is always the possibility that they could have acted otherwise. They know why they act and what they do. If asked, they will usually be able to explain or rationalise the grounds of their social action. This may be at a discursive level, whereby they can give reasons for their behaviour using their linguistic skills to speak, write and reflect about the rules and resources involved in their social interaction. Alternatively it may be at a practical level, whereby they rely on implicit stocks of knowledge about how to act and how to interpret events and actions (Giddens, 1984, p.5).

It also illustrates that not all human agency can be defined in terms of intention. Some structures result from human actions which are not intended. The consequences of rationally-calculated action may sometimes be unforeseen, or human action may not be guided by conscious intention at all. Either way, the structural outcome of human action may be quite different from what was anticipated or intended (Giddens, 1984, p.8).

Routinisation and ontological security are key building blocks in Giddens' interpretation of the agent (Macintosh and Scapens, 1990). Routinisation is a fundamental aspect of structuration. 'Routine' describes whatever is done habitually across time/space locations (Giddens, 1984, p. xxiii). In routine social situations, structures tend to dominate agency. However, in 'critical' situations, meaning situations characterised by sharp changes in conditions, established routines are undermined or shattered and social systems are likely to change through the action of individual agents. This continuity or change in social systems occurs through

structuration (Giddens, 1984, p.60). The ability of Structuration Theory to provide an explanation of social change illustrates its advantage over structuralism. However, agents do have a primary need for ontological security, that is, a sense of continuity and order regarding the events that they are engaged in. The maintenance of situations that are predictable and stable over time and that are ordered in space provides an important means of coping with subconscious anxiety. This sometimes motivates agents to routinely reproduce structures even if they recognise these structures as ineffective or even coercive (Giddens, 1984, p.60).

Giddens' Structuration Theory made a 'small but distinctive contribution to management accounting research' (Baxter and Chua, 2003, p.100), primarily as a 'sensitising device' facilitating an in-depth analysis of how management accounting practices may be implicated in the social order of organisations (Macintosh and Scapens, 1990). The next section will review this literature.

3.2.3 Giddens' Structuration Theory and accounting research

Structuration Theory has proved to be a helpful framework with which to analyse accounting information systems. For example, in terms of signification structures, accounting discourse is frequently the means by which managers make sense of business activities. Drawing on legitimation structures, accounting information is often used to legitimise business activities and to justify business decisions and, drawing on structures of domination, accounting data are regularly used as a tool with which to exercise power within an organisation. Signification structures are implicated in domination structures and all three are subject to constant change as they are drawn upon and reproduced or reconfigured through the use of management accounting systems by organisational participants (Scapens and Macintosh, 1996).

Structuration Theory has been relied upon as a sensitising device for researchers to understand the nature of accounting information and its role in the organisation. Roberts and Scapens (1985) use Structuration Theory to examine how accounting systems supplement local meanings and norms by imposing discipline on the work of dispersed organisational participants. Roberts (1990) illustrates, in structuration terms,

how face-to-face meetings between divisional managers build a greater sense of local accountability than more formal systems of measurement and control. Macintosh and Scapens (1990, 1991) and Scapens and Roberts (1993) use Structuration Theory to explore how management accounting systems change over time and why there might be resistance to change in management accounting practices. Similarly, Ahrens and Chapman (2002) and Conrad (2005) use Structuration Theory to examine aspects of accountability as well as tradeoffs between legitimacy, signification and domination over time.

These studies demonstrate the suitability of Structuration Theory as a 'sensitising framework' for the analysis of management accounting systems as they are used in organisations (Macintosh and Scapens, 1991). Examining management accounting systems in terms of signification, legitimation and domination structures, together with their underlying modalities, recognises accounting as a social phenomenon within an organisation. These studies tell a story of how and why accounting information in specific organisational circumstances plays the role that it does.

3.3 GIDDENS' STRUCTURATION THEORY – LIMITATIONS AND CRITICISMS

Giddens' work has been considered underdeveloped in certain fundamental areas and has been subject to criticism in the literature. It is considered excessively philosophical. It lacks clarity on external structures. It pushes the notion of methodological bracketing too far. It lacks insight into an agent's position practices. Finally, attempts to overcome the realism-structuration divide mean that the effects of past practices on present actions are effectively ignored. These criticisms are now considered in more detail.

3.3.1 Excessively philosophical

Firstly, Giddens' work has been accused of being overwhelmingly philosophical (Thrift, 1985; Bauman, 1989; Gregson, 1989) and limited in terms of its role in guiding the understanding of specific phenomena in terms of time or place (Stones, 2005, p.7). Its application to empirical research has been considered doubtful and has been described as a 'meta-theory', or a way of thinking about the world, as opposed to an empirically testable explanation of social behaviour (Thrift, 1985; Baumann, 1989; Gregson, 1989). Giddens himself claims that Structuration Theory is 'essentially procedural and does not supply concepts useful for the actual prosecution of research' (Giddens, 1990, p.311). He favours the use of Structuration Theory as a 'sensitising device' for the examination of social behaviour. In this context a sensitising device is a type of analytical tool which provides an organised way of making sense of social life (Giddens, 1984, p. 326). Indeed most accounting studies adopting Giddens' Structuration Theory have employed it in this way (Jack and Kholeif, 2007).

3.3.2 Lack of clarity on external structures

Giddens' conception of Structuration Theory is based on a mutually interacting duality of structure which contains both subjective and objective elements. Within this theory, human agency is entirely subjective, but it can create social structures which then become externalised and subject to objective analysis. In recognising the existence of this duality of structure, Giddens accepts the existence of an external structural context within which an agent must operate. However, he goes on to focus on the agent's internal knowledge of those structures and how that specifically influences his behaviour. The external structural context itself is virtually ignored, leading to a lack of clarity as to how the duality of structure actually operates (Whittington, 1992; Archer, 1995; Parker, 2000). Giddens describes structures in terms of memory traces and stocks of knowledge about the distribution of meaning (structures of signification), norms (structures of legitimation) and power (structures of domination) within the terrain of action, but gives very little attention to the material elements of that terrain of action. Giddens' preoccupation with internal

structures is accused of leading to a failure to properly explain the notion of external structures and how they interact with each other (Stones, 2001).

3.3.3 Methodological bracketing

According to the duality of structure theory, agency and structure presuppose one another. In this sense, it is conceptually impossible to separate the actions of agents from the structures that are the medium and outcome of their actions. However, Giddens, concerned with the difficulties of applying Structuration Theory at a concrete and substantive level, distinguishes between the 'analysis of strategic conduct' and 'institutional analysis'. The former puts the spotlight on agency while the latter highlights social structure (Scapens and Macintosh, 1996). In other words, Giddens contends that it is not possible to consider the structural and agential aspects of a situation simultaneously; one has to consider them separately. This 'methodological bracketing' encourages us to momentarily ignore how people produce and reproduce structures in daily life when engaged in institutional analysis, or to ignore properties of institutional context when engaged in the analysis of strategic conduct. Giddens considers this necessary because of the practical and methodological problems associated with examining both at the same time (Giddens, 1984, p.288). Methodological bracketing is a tool with which Structuration Theory may be operationalised as a framework for empirical research. There is however a danger that pushing this bracketing too far succeeds in re-introducing the dualism between objectivism and subjectivism which the theory of duality of structure was intended to eradicate in the first place (Scapens and Macintosh, 1996).

3.3.4 Social positions and position practices

Within the methodological bracketing discussed in the previous section, Giddens (1984) describes the term 'social position' as:

A social identity that carries with it a certain range of prerogatives and obligations that an actor who is accorded that identity may activate or carry out- these prerogatives and obligations constitute the role-prescriptions associated with that position (p.84).

An example of a 'social position' might be a company's managing director or a member of the Finance function. Giddens does not explain how these social positions are produced and re-produced in the duality of structure. Social identity might explain how structures persist, but not how the actions of the incumbents of each position reproduce those identities (Cohen, 1989). In other words, Giddens does not consider how structuration occurs in the context of specific roles or positions and the recognisable behaviours associated with them.

Subsequent theorists sought to establish what Thrift (1985, p.618) referred to as the 'missing institutional link' in Giddens' work. Bhasker (1979) used the term 'position practice' to describe the slots in which actors, in clustered groups, fit in order to reproduce structures. These slots incorporate the 'position' which the actor occupies, and the 'practice' in which the actor must engage by occupying that position. Cohen (1989) did not accept the notion that positions are 'slots' into which actors are placed, considering that this ignores the fact that agents can accept, modify and disregard roles rather than necessarily acting within the roles assigned to them. The roles need to be continually sustained through embedded practices or active position-taking. Cohen (1989) combines and modifies the views of Giddens and Bhaskar, describing 'position practices' as resulting from past practices that pre-exist the human agents that subsequently inhabit, re-produce or transform them. Cohen's treatment of 'position practice' becomes very important in subsequent Structuration Theory frameworks.

3.3.5 The realism-structuration divide

Ultimately, Giddens' Structuration Theory attempts to unite the interpretative and functionalist traditions into a single theoretical framework, which subsumes the traditional subjective/objective perspective of social theory.⁵ Giddens' key contribution is his proposal that agency and structure are not two independent

⁵ The interpretative and functionalist traditions refer to Burrell and Morgan's (1979) functionalist and interpretivist paradigms for the analysis of social theory. The functionalist paradigm assumes that the social world consists of hard immutable structures and suggests that organisational behaviour can be best understood through hypothesis testing. The interpretivist paradigm assumes that reality is constructed by social perception and that, therefore, predictions cannot be made. This is explored in detail in Section 4.3.5.

phenomena with one superseding the other, but that agency and structure exist as a duality, which are simultaneously both the medium and the outcome of social interaction (Sewell, 1992; Whittington, 1992).

One of Giddens' strongest critics, Margaret Archer, criticises Structuration Theory for its combination of individual agency and social structure into a single recursive relationship that blends structuralism and individualism. She suggests that Giddens' 'duality of structure' conflates agency and structure to such an extent that structures appear only to be a product of contemporary practices and that they only exist in the 'here and now'. This, in her view, ignores the effect of past practices on present action (Archer, 1996).

Archer does however agree that social theory must explain the relationship between individual agency and social structure. She therefore proposes a realist social theory, deriving from a morphogenetic approach, which, in contrast with Giddens' Structuration Theory, recognises an analytical dualism between structure and agency. Archer contends that social structures pre-exist agents, but that they are transformed or re-produced through agents' actions. In other words, structures exist that constrain and enable agents, whose actions produce intended and unintended consequences that lead to the re-production or transformation of the initial structures. The resulting structures provide a context of action for future agents. So, while structure and agency are interdependent, Archer also argues that they are analytically distinct, i.e. a dualism. To this end, she argues that any attempt to eradicate this dualism, as occurs in Structuration Theory, is incompatible with the distinction between agency and structure which exists in realist social theory (Archer, 1995).

British social theorist and proponent of Structuration Theory, Rob Stones, accepts elements of Archer's morphogenetic approach. He believes it to be an advance for social theory, particularly in terms of the temporality implied in its characterisation of action; structure precedes action, which leads to a structural outcome, which provides the preconditions for action. Stones disagrees, however, with Archer's contention that a realist approach such as hers is entirely incompatible with Structuration Theory, accusing her of misinterpreting Giddens' notion of duality (Stones, 2001). Giddens does focus on the structures which are created in the moment of structuration, in

‘what people actually do’ (Giddens and Pierson, 1998, p. 81), but he also recognises that people’s actions take place within a context which places ‘limits upon the range of options open to [them]’ (Giddens, 1984, p. 177). According to Stones (2001), Giddens rejects any dualism which always views structures as being entirely external to the agent. Instead, according to Stones, he distinguishes between virtual structures, which are internal to the agent, and objective external structures. Action is always mediated through the former but agency is affected by both (Jones and Karsten, 2008).

Stones (2001, 2005), in his development of Structuration Theory, draws on all of these criticisms, debates and defences in relation to Giddens’ work. A detailed account of Stones’ framework is presented in the next section.

3.4 STONES’ STRONG STRUCTURATION THEORY

Stones builds on Giddens’ construct, providing what he describes as a strengthened version of Structuration Theory which has more resonance in empirical research (Stones, 2005, p.1). Parker (2006) describes Stones’ theory as ‘the most serious attempt to date to give Structuration Theory a new lease of life (p. 122)’. In order to encourage its use at a more empirical level, Stones moved away from what he called Giddens’ ‘ontology in general’, developing Structuration Theory so that it could be used to guide empirical research in specific situated contexts, otherwise known as ‘ontology in situ’, via a meso-level framework.

3.4.1 Stones’ strong Structuration Theory- key concepts

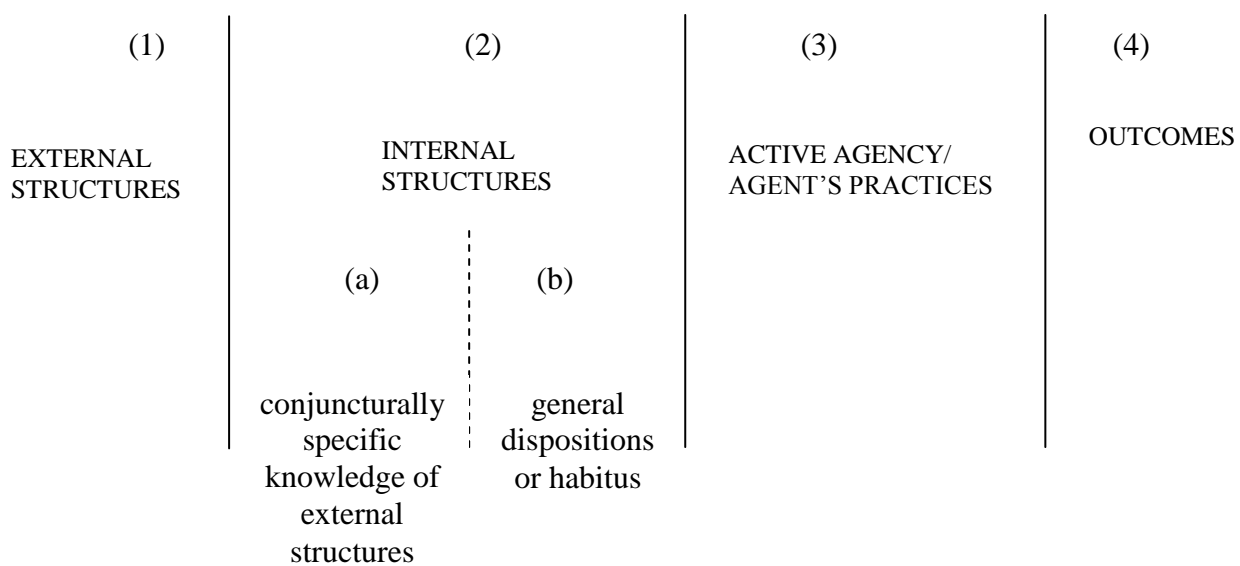
As represented in Figure 3.3, Stones’ meso-level framework breaks the notion of the duality of structure into four analytically separate components called the quadripartite cycle of structuration. These are: (1) external structures as conditions of action; (2) internal structures within the agent; (3) active agency, i.e. when agents draw on internal structures in producing practical action; and (4) outcomes, as external and internal structures and events (Stones, 2005, p.84). These four components are introduced by Stones in order to:

... elaborate upon and clarify the variety and nature of the elements involved in the duality of structure (p.9).

3.4.2 External structures

Giddens' critics, most notably Archer (1995), call attention to his neglect of external structures and discuss the notion of the 'objective existence' of external structures and, in particular, the degree of constraint imposed by those external structures. Stones (2005) believes that Archer's conception of external structures separates these structures from the agents and negates the role of the agents and, in turn, the duality of structure within external structures. In response, he presents external structures as those structures which provide the agents with their conditions of action.

Figure 3.3: The quadripartite nature of structuration



(Stones, 2005, p.85)

Describing them as 'independent forces and pressuring conditions that limit the freedom of agents to do otherwise' (p. 109), Stones gives particular consideration to the nature of the autonomy of external structures, wishing to avoid accusations of being overly voluntaristic in his conceptualisation of them. To this end, within external structures he distinguishes between *independent causal influences*, where the external structures are constituted, reproduced or changed independently of the wishes of the agents although they may directly affect the life of the agent, and *irresistible*

causal forces where the agent has the capacity to resist an external influence but feels unable to do so. While independent causal influences are entirely independent of the control of the agent, an agent's capacity to control or resist an irresistible causal force is dependent on his hermeneutic frame with all of its beliefs, understandings and meanings. They have, what Stones (2005) describes as, a 'value-dependent' influence (p. 112).

External structures involve position practices and their networked relations. Stones (2005) describes position practices as the tangible systems through which external structures are mediated. In this way, Stones is subscribing to Cohen's (1989) interpretation of position practices as routines and recognisable behaviours associated with a particular role or phenomenon (3.3.4).

In Stones' view then, position practices result from past practices and pre-exist the human agents that subsequently inhabit them but, like all structures, their reproduction or modification requires action by the agent inhabiting them. In this context, Stones is identifying structures independently of their occupants. Institutionalised positions, positional identities, prerogatives and obligations are accepted as emergent properties of past practices and provide pre-existent conditions for subsequent actions, rendering them in effect external structures (Stones, 2005, p.63). Stones' meso-framework contributes to Giddens' original Structuration Theory by facilitating an exploration of how specific position practices emerge in the first place.

3.4.3 Internal structures

Archer (1995) criticises Structuration Theory for its combination of agency and structure into a single recursive relationship. She argues that Giddens' stance on the duality of structure, in which structures refer to the agent's internal knowledgeability of structures, means that it is impossible to tell where structures begin and agents end, and vice versa. Stones defends Structuration Theory against this criticism by referring to Giddens' distinction between virtual structures which are internal to the agent and objective external structures (3.3.5). Stones develops this notion of virtual or internal

structures by suggesting that there are aspects of an agent's internal structures which are habitual or generalisable, and there are aspects which are oriented towards a particular job or task.

The latter he describes as *conjuncturally specific internal structures*. These emerge from a specific role or position that has various rules and norms embedded within it. Ultimately, conjuncturally specific internal structures refer to the situated agent's knowledge of the three intrinsically linked aspects of structures presented by Giddens. While Giddens discusses virtual structures of signification, Stones describes the situated agent's own sense of the interpretative schemes and discursive practices associated with his role, as well as conjunctural knowledge of how particular positioned agents within a given context would interpret the actions and utterances of others. While Giddens refers to virtual structures of legitimation, Stones discusses the situated agent's own sense of the normative expectations that come with his position, as well as conjunctural knowledge of how agents-in-context would be likely to decide to behave. Finally, while Giddens describes virtual structures of domination, Stones refers to a situated agent's own sense of the power capacities existing within a given conjuncture, as well as conjunctural knowledge of how agents within a particular context see their own conjuncturally specific power capacities (Stones, 2005, pp. 89 – 92). In essence, Giddens can be credited with recognising the importance of an agent's internal knowledgeability within a given contextual conjuncture, labelling them structures of signification, legitimation and domination. Stones developed Giddens' explanation of internal structures by providing a model which helps us to relate this internal knowledge to external structures (Parker, 2006).

The habitual and generalisable elements of an agent's internal structures, described as *general dispositional internal structures*, are transposable skills and dispositions, including general world views, cultural schemas, typified recipes of action and habits of speech and gesture. These dispositional internal structures, for the most part, exist in a 'taken-for-granted' and unnoticed state, and are drawn upon naturally without reflection (Stones, 2005, p.87).

Stones (2005) uses his structuration-informed analysis of the pound sterling valuation policies of Harold Wilson's Labour Government in the United Kingdom (UK) from

1964 to 1970 to illustrate these internal structures (p. 95). This was a period during which the UK government experienced four currency crises, ultimately leading to a devaluation of the pound sterling in 1967. Stones identifies and discusses the specifics of the immediate conjuncture within which the government had to act. In his analysis, Stones does not use Giddens' specific terminology when discussing the government's conjuncturely specific internal structures but it is not difficult to detect the link between Stones' description and Giddens' terminology. He describes power resources and specifically how the government's actions would have been informed by their knowledge of the power possessed by holders of sterling who might withdraw their sterling investments causing a run on the pound. This illustrates how the government drew on their internal domination structures. Stones describes the government's fear of sanctions by the international financiers who were under-writing sterling, again illustrating how the government drew on their internal legitimation structures when making decisions. Shared understandings of financial markets, macro-economic policy and the international financial system facilitated communication and interaction between the government and all of their networked others. This illustrates how the government also drew on their internal signification structures to inform their actions.

The government's general dispositional internal structures are those more transposable aspects of their internal knowledge which are evident in their attitude to their circumstances and conditions. Stones identified the principles of Keynesian welfare state social democracy, as well as a principled commitment to full employment, higher living standards and an expansion of social welfare services, as the most significant aspects of this Labour Government's dispositional frame.

3.4.4 Active agency

Active agency refers to the way in which agents draw upon their internal structures and apply their knowledge and understanding to the situations in which they operate. It encapsulates the observable behaviour during which an agent, motivated by his internal structures, chooses to act in order to confront his external structures (Stones, 2005, p.100).

The concept of agency is amongst the most problematic in social theory. It is considered vague and elusive, primarily because it is very difficult to disentangle agency from the structures to which it is so tightly bound (Emibayer and Mische, 1998). Archer (1982, 1988, 1995, 2000) was particularly concerned by Giddens' refusal to separate structure from agency in his presentation of the duality of structure (3.3.5) but Stones addresses this criticism by explaining that structures, both internal and external, while causally influential, can pre-exist the moment of their being drawn upon. He illustrates this as follows:

I will usually be expected to have a sense that I have a \$10 note before I decide to spend it. I will also know - more or less well - about any other forms and sources of wealth, income and likely calls on these within a relevant time horizon, and this background knowledge will play its part, virtually, in that action that is the spending of the \$10 note (Stones, 2005, p. 56).

In this sense, an agent's external and internal structures, presented above in Sections 3.4.2 and 3.4.3 respectively, combine in the moment when an agent chooses to act. This is consistent with Mouzelis' concept of the 'situational-interactive conduct of the agent'. He describes how an agent's internal and external structures combine when that agent either consciously and strategically decides to act, or simply reacts without any conscious decision to do so (Mouzelis, 1991, P. 128). Stones (2005, pp. 101-103) highlights five aspects of active agency which must be considered when examining the character of and dynamism within an agent's conduct. These are:

- (1) The horizon of action arising from the motivated, purposive action in hand - this is significant because it influences which particular aspects of an agent's internal and external structures will be animated during that action.
- (2) The possibility of creativity, improvisation and innovation within an agent's conduct - such improvisation will emerge, not from unpredictable creative forces, but from a combination of the orientations, principles, habits and skills sedimented within an agent's habitus, as well as the perceived demands of his specific conjuncture.
- (3) The varying degrees of critical distance which agents bring to their internal structures - this refers to the extent to which an agent reflects on his own conduct.

- (4) The impact of conscious and unconscious motivations on the way that internal structures are mediated, perceived and drawn upon by agents - in this way Stones is acknowledging the depth, complexity and internally-conflictual nature of the agent.
- (5) The ordering of concerns or the categorising of priorities into a hierarchy of purposes - this acknowledges a plurality of possible projects attached to various status and role positions.

Stones' examination of active agency expands on Giddens' stratification model of action, which effectively constructed a continuum between the unreflective and reflective dimensions of action (discussed in Section 3.2.2). Despite presenting a model that explores how agents reflect on their own behaviour, Giddens focuses more on routinised practices in which behaviour is habitual and largely unreflective (Emibayer and Mische, 1998). Stones' position on active agency acknowledges the complexity of agents: their varying degrees of critical distance from their structures, their potential for internal conflict and their internal ordering of concerns and projects.

3.4.5 Outcomes

As discussed from the outset of this chapter, the central tenet of Structuration Theory is the duality of structure, that is, the notion that structures are both the medium and the outcome of social interaction. To date, the outcomes of structuration have received little attention in their own right. This is perhaps due to Giddens' reluctance to distinguish between structure and agency in his presentation of the duality of structure (Stones, 2005, p.21). Outcomes are the result of active agency. This encapsulates the effect of action and interaction on both internal and external structures, as well as other kinds of outcomes. The effects of agency on structures, both internal and external, might result in their being changed, elaborated on, reproduced or preserved. Other kinds of outcomes refer to any event resulting from social interaction, regardless of their impact on structures. This will frequently include the success or failure of the agent's purpose (Stones, 2005, p.85).

3.4.6 Methodological bracketing reconsidered

As set out in Section 3.3.3, Giddens, agreed that it is not possible to consider the structural and agential aspects of a situation simultaneously and encouraged a process of methodological bracketing, distinguishing between the ‘analysis of strategic conduct’ and ‘institutional analysis’. The former puts the primary focus on agency and the latter highlights social structure. Giddens’ approach was criticised for effectively re-introducing the dualism between agents and structure which he had tried to overcome (Englund and Gerdin, 2008; Englund, Gerdin and Burns, 2011; Kilfoyle and Richardson, 2011). Stones defends Giddens’ use of methodological bracketing but criticises his failure to explore the connecting tissue between the two brackets (Parker, 2006). He replaces Giddens’ ‘analysis of strategic conduct’ with conduct analysis, which focuses attention on the internal aspects of the agent, and he replaces Giddens’ ‘institutional analysis’ with context analysis, which focuses attention on the external aspects of the agent (Stones, 2005, p. 121). Conduct analysis examines the agent’s knowledgeability, focusing on his dispositional and conjunctural internal structures as well as his reflexive monitoring, ordering of concerns, hierarchy of purposes and motivations. Context analysis examines the terrain facing the agent, as opposed to Giddens’ institutional analysis, which treats institutions as chronically reproduced rules and resources. It also recognises the relationships and interactions between the internal and external aspects of the agent, thereby leading us ‘through the agent, out into the conjunctural terrain of action’ (Stones, 2005, p. 122).

This is the essential contribution of Stones’ quadripartite cycle of structuration. It recognises the effects of actions and interactions on both external and internal structures. It retains the theory’s focus on the knowledgeability and conduct of agents but recognises the extent to which this knowledgeability and conduct is affected by external structures (Parker, 2006). This is how Stones strengthened the original structuration construct, moving away from Giddens’ ‘ontology-in-general’ to an ‘ontology-in-situ’. Stones’ form of methodological bracketing, when applied to empirical evidence, can yield substantive insights into the processes of structuration taking place in an environment under review. He presents a series of recurrent steps which provide more subtle and differentiated distinctions within each broad bracket

(Stones, 2005, p. 123). These steps are discussed in more detail in Section 4.10 which describes the means by which the study's data are analysed.

3.5 STONES' STRONG STRUCTURATION THEORY IN ACTION

Stones (2005) presents two detailed examples of strong Structuration Theory in action, each of which illustrates aspects of the four parts of the quadripartite character of the duality of structure.

The first example re-examines Morawska's (1996) case study of the Jewish migrant population in a small Pennsylvanian town during the fifty year period immediately preceding 1940. In this example Stones locates his detailed structuration study within broader historical and social trends. He focuses primarily on the relative durability of longstanding routines within this group. He demonstrates how the migrants' dispositional perspectives slowly evolve as they engage more and more with their host country's traditions and lifestyles, leading to significant changes in roles and behaviours amongst the Jewish community.

The second example is a strong structuration analysis of the chain of events in Ibsen's Nineteenth Century play, *A Doll's House*. While the Morowska study can be located within a socio-historical perspective over a lengthy time period, the Ibsen study focuses on micro interactions between individuals over a short, intense and highly transformative time period. This example demonstrates the effects of instability and the unsettling of routines on an agent's internal structures. In particular, it illustrates how shifting the focus of structuration from agent to agent highlights how individuals differently situated in different positions within sets of position practice relations confront varying external conditions, constraints and opportunities in different ways.

Greenhalgh and Stones (2010) adapt strong Structuration Theory and combine it with actor-network theory (ANT) ⁶ to examine technology programmes used in the UK National Health Service. In this way, they examine the links between human agents

⁶ ANT provides a framework with which to consider the dynamic relationships between human and non-human actors in a network (Greenhalgh and Stones, 2010).

and technology in dynamic networks of position practices. They focus first on the broad strategic terrain within which individual actors apply their knowledge to take action with respect to technology. They go on to examine the local circumstances of technology users within a specific conjuncture. The authors admit that adding technology as a third strand to the ‘agent-structure’ relationship complicated the ontological picture, but it did raise some interesting questions in terms of the capacity of technology to have agency.

3.5.1 Stones’ strong Structuration Theory and accounting research

Several studies in the management accounting stream have drawn on Stones’ work to explore the role of management accounting in varying contexts and circumstances. In doing so they have contributed to our understanding of Stones’ elaboration of Structuration Theory.

Jack and Kholeif (2007) discuss the potential for Stones’ strong Structuration Theory in guiding qualitative case study research in organisation, management and accounting disciplines. First, they revisit two of their own studies in order to apply Stones’ theory in an accounting context. They go on to examine the appropriateness of Stones’ theory in the context of two important papers: Ahrens and Chapman (2006), which discusses the relationship between case research and theory, and Pozzebon and Pinsonneault (2005), which examines the use of Structuration Theory in Information Technology (IT) research.

Jack (2004, 2005) uses a mixture of institutional theory and Giddens’ Structuration Theory to explore why certain accounting practices have persisted over a fifty-year time span, specifically examining the use of the agricultural gross margin in UK agriculture since the 1960s. The data collected describes different clusters of actors behaving in different ways, all contributing to inertia in terms of the development of new management accounting practices. The theoretical frameworks considered were found by Jack to be inadequate to explain the findings, and the data analyses were recast in terms of Stones’ strong structuration ontology. Jack based this re-analysis on Stones’ (1996) study together with unpublished chapters of Stones’ (2005) work

which were made available to Jack. A strong structuration approach encouraged what Jack and Kholeif (2007) describe as ‘mid level contextualisation’ (p. 218), which facilitated a focus on a number of actors in different groups (farmers, governments and advisors) who provided insights into their own and their industry’s practices. What resulted were two investigations. The first is a review of the literature and documentation examining the initiation and implementation of the agricultural gross margin over a fifty-year time period. The second explores more deeply aspects of signification, legitimation and domination amongst the actors and clusters of actors in the different groups. Combined, these investigations resulted in a study which shares Stones’ (2005) concern for both ‘hermeneutics and structural diagnostics’ (p. 81).

Kholeif’s (2005) examination of how an organisation’s introduction of an Enterprise Resource Planning (ERP) system affects the role of the management accountant was originally conducted using a similar fusion of structuration and institutional theories. The emergence of Stones’ (2005) strong structuration framework facilitated an enhanced analysis of the actions and structures involved. This revised study was introduced in Jack and Kholeif’s (2007) work and presented in detail in Jack and Kholeif’s (2008) study. In these, they clearly identify the quadripartite nature of structuration in operation, highlighting the difficulties in establishing enduring structures when there are conflicting dispositions and conjecturally specific understandings within the roles of different clusters of actors in the organisation. In light of such conflicts the role of the management accountant becomes overwhelmed by the position practices of internal and external actors, and ultimately reverts to the traditional roles of data custodian and information provider.

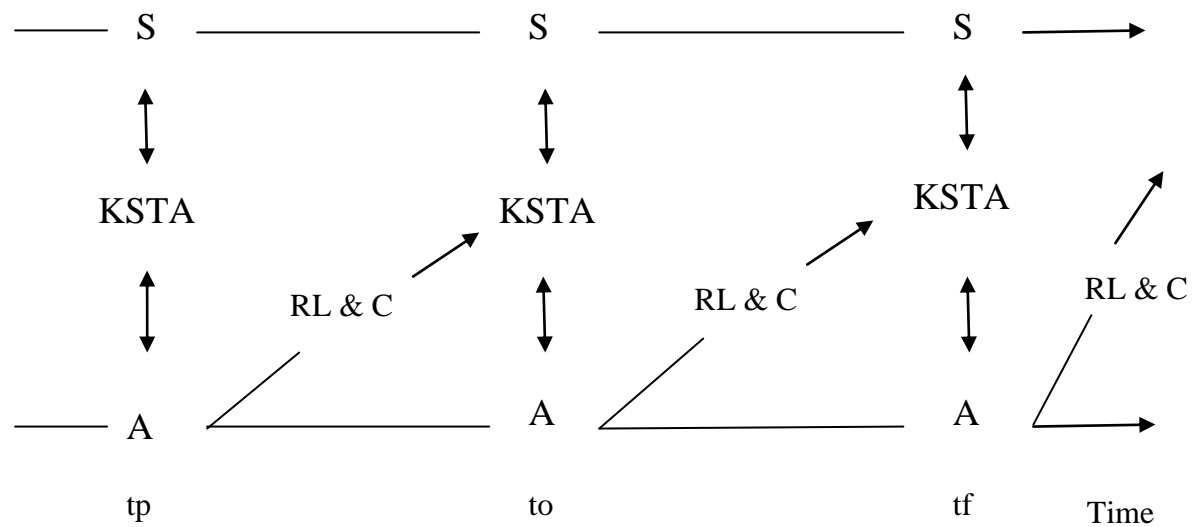
Jack and Kholeif’s (2007) paper provides a compelling case for the use of Stones’ (2005) strong Structuration Theory to inform substantive empirical research. The theory emerges from rigorously-argued ontological grounds, which are in keeping with the views of Ahrens and Chapman (2006). It addresses Pozzebon and Pinsonneault’s (2005) concerns that few studies in management and accounting literature recognise any critical work on Giddens’ theory since 1984.

Coad and Herbert (2009) combined Stones’ strong Structuration Theory approach with a skeletal model of the structuration process to analyse a case study of

management accounting practices in a privatised utility company. In the skeletal theory of the structuration process presented by them, they depict the relationships between structures (S), agency (A), knowledge of structures and theories of action (KSTA) and reproduction, learning and change (RL & C). S represents structures as ‘external’ or ‘actual’. Coad and Herbert then conceptualise internal structures as KSTA. This is designed to capture the essence of structuration without perpetual reference to the Giddensian structures of signification, legitimation and domination, whilst also incorporating the dispositional aspects of Stones’ internal structures.

Their model, as set out in Figure 3.4 below, emphasises the temporal aspect of structuration and, by adding the RL and C dimension, seeks to provide some insight into how internal structures are reproduced and changed over time.

Figure 3.4: A skeletal theory of the structuration process



Key
 S : Structures
 KSTA : Knowledge of structures and theories of action
 A : Agency
 RL & C : Reproduction, learning and change
 tp : Past
 to : Present
 tf : Future

(Coad and Herbert, 2009, p. 180)

Coad and Herbert’s separation of the KSTA and A of management accountants and engineers in their case company highlights the significant differences in their KSTA in respect of management accounting practices. In their case study, the accountants

believed that they had encouraged cost consciousness amongst engineers, while the engineers believed that this cost consciousness was a long-standing attitude within the company and that the management accountants were of little value except as a control device for senior management. Furthermore, the longitudinal nature of their study allowed Coad and Herbert to examine how external structures, internal structures, and management accounting practices differed between 1998, 2002 and 2007. However, their analysis stops short of exploring why. They attribute their inability to further explore changes in internal and external structures to the weakness of Stones' model in terms of providing guidance as to why structures interact in the way that they do, and how this influences the reproduction of, or changes in, management accounting practices. They argue that further insight into the processes of RL & C requires a greater depth of understanding of the 'connecting tissue' between the elements of the quadripartite model (Coad and Herbert, 2009, p. 191).

In all of these studies, strong Structuration Theory was used to enhance the analysis of the data available. The data were gathered with alternative, though similar, theoretical approaches in mind. Jack and Kholeif (2007) are particularly vocal with regard to the potential of Stones' (2005) framework to enhance case study work, particularly if introduced at a design stage so that researchers can more explicitly examine internal and external agents and structures.

3.6 CONCLUSION

This chapter introduced the theoretical lens that will be used to interpret the findings of the study. In this regard, Structuration Theory facilitates an examination of the use of accounting information as a social phenomenon. It was first introduced by Giddens, who described social systems as having structures that were both the medium and the outcome of social interaction. He called this the 'duality of structure'. Giddens' initial framework provides a valuable tool for exploring the role of accounting in producing meaning, power and norms in organisations. Stones subsequently elaborated on Giddens' model breaking the duality of structure into four analytically separate components: external structures, internal structures, active agency and outcomes. Stones himself claimed that his strong structuration model retains the core

strengths of Giddens' construct while addressing its weaknesses and limitations. For the most part, this is what it does. By articulating the relationship between external and internal structures, Stones addresses Giddens' lack of guidance as to how Structuration Theory may be applied at a substantive level (i.e. how we proceed from macro to micro levels of social reality). By incorporating Cohen's 'position practice' and networked agents, Stones provides the tools with which to map out the relationships between clusters of actors and how these affect internal and external structures.

There is a growing recognition in the literature that Stones' model addresses the challenges to Giddens' original construct. In particular Stones revisits Giddens' original concept of methodological bracketing. He retains Giddens focus on the knowledgeable and conduct of agents, but recognises that this knowledgeable and conduct is affected by external structures. This recognition of the interaction of internal and external structures is precisely why Stones' model provides a valuable tool with which to guide empirical research in specific contexts.

Structuration Theory, incorporating the principles of both Giddens' and Stones' frameworks, allows us to take a broad view of a social system in order to develop a complete picture of the clusters of actors involved and comprehensively examine the relevant structures, both internal and external, and to understand how these are formed, reformed or modified through the actions of agents. A detailed account of how Structuration Theory is incorporated into this study's research design is presented in Chapter Four

Chapter Four

Research Methodology and Research Methods

4.1 INTRODUCTION

A researcher's chosen theoretical perspective is fundamental to their study's design. The choosing of a theoretical perspective is often as much a voyage of discovery as the actual gathering of empirical data. While, to a certain extent, the appropriate perspective will emerge as the various stages of the study are designed and executed, ultimately it will be shaped by the researcher's beliefs and assumptions about the world, knowledge and human behavior.

The study's theoretical perspective is grounded in Structuration Theory because it provides a model with which to make sense of social actions in organisations or institutions. Structuration Theory, a detailed account of which is presented in Chapter Three, is a sociology framework which draws from a number of philosophical influences and seeks to reconcile many of the theoretical dichotomies of social systems. It is therefore necessary, in the early part of this chapter, to provide an overview of the varying theoretical perspectives of research in the social sciences in general, and in accounting in particular. This overview examines the debates which have emerged between these different schools of thought and, in doing so, explains how Structuration Theory has emerged as a mediating concept to resolve the split within the social sciences between those who consider social phenomena to be the product of human action, and those who consider it to be caused by objective social structures.

Section 4.2 presents the study's research objective. Section 4.3 sets out some fundamental assumptions on knowledge and social phenomena, and introduces Burrell and Morgan's seminal framework which identifies four contiguous, but mutually exclusive, sociological research paradigms. Section 4.4 discusses the various philosophical perspectives of accounting research and how these have emerged from the wider social science discipline. Hopper and Powell's taxonomy builds on Burrell and Morgan's framework, providing a useful overview of research traditions in finance and accounting. This overview provides an insight into the roots of Structuration Theory. Section 4.5 explains the philosophical assumptions and the theoretical approach underpinning this study. A description of the research design is set out in Section 4.6. Data was gathered by means of an embedded case study that

was conducted within a single organisation. A description of the data-gathering techniques employed is presented in Section 4.7. Section 4.8 discusses the analysis of the initial exploratory data gathered in 2007 and its implications in terms of refining the research objective and focusing the search for the study's theoretical framework. Data analysis of the final case study was performed in two phases. The first, outlined in Section 4.9, resulted in a rich understanding of the case site, the process of developing new products in that site and the use of accounting information in the development of new products. The second phase of the data analysis, described in Section 4.10, examined the data through the theoretical lens of Structuration Theory. The final section concludes the chapter.

4.2 RESEARCH OBJECTIVE

Accounting information is presented in the literature as a valuable NPD resource that facilitates cross-functional dialogue, communicates profitability objectives and supports managers in managing resources and controlling costs (Cooper and Chew, 1996; Nixon and Innes, 1997, 1998; Hertenstein and Platt, 2000, 1998; Rabino, 2001). Chapter Two presents a series of studies from both the accounting and the NPD literature, describing how accounting information ought to contribute to each stage of the NPD process and setting out the role the Finance function ought to play in order to facilitate this. These assertions, however, are largely normative and the validity of their benefit claims has not yet been firmly established empirically. This has resulted in little or no understanding of the relationship between accounting information and NPD. With this in mind, the objective of this study is to explore the role of accounting information in NPD.

NPD is a complex social action involving a wide range of different actors and clusters of actors, all acting together, though in different ways, and drawing on structures that are both internal and external. Structuration Theory provides a comprehensive way to critically analyse and understand the role of accounting information in this process. Sections 3.2.3 and 3.5.1 demonstrate how useful Structuration Theory has proven to be in a range of different accounting practice contexts. However, it has yet to be applied in an NPD context.

4.3 FUNDAMENTAL ASSUMPTIONS ON KNOWLEDGE AND SOCIAL PHENOMENA

Burrell and Morgan (1979) conceptualise the philosophical underpinnings of social science in terms of four cascading groups of assumptions relating to ontology, epistemology, human nature and methodology. This provides a systematic means by which to understand how a researcher's view of the world underpins his or her research activity in general, and this study in particular. The following sections set out each of these in turn.

4.3.1 Ontology

Ontological assumptions are those which relate to the nature of reality and, specifically, whether reality exists independently of an individual or whether it is the product of one's mind (Gill and Johnson, 1997). In terms of ontological debate, Burrell and Morgan (1979) distinguish between realism and nominalism. Realists assume that the social world exists independently of the individual and consists of hard, tangible and immutable structures. The nominalist perspective, on the other hand, assumes that the social world external to the individual is made up of nothing more than names, concepts and labels which are used to structure reality (Burrell and Morgan, 1979).

4.3.2 Epistemology

Epistemology concerns the nature of knowledge, specifically, what form it takes, how it can be acquired and how it can be passed on to others (Gill and Johnson, 1997). In this context, Burrell and Morgan (1979) broadly distinguish between positivism and anti-positivism. Positivist researchers understand the social world through explanations based on predicted regularities and causal relationships (Easterby-Smith, Thorpe and Lowe, 1991). The research approach is grounded in objectivity. It requires *a priori* hypotheses, the measurement, isolation and control of variables and the verification of measurement methods (Smith, 2004).

Positivists search for universal laws, so it is unsurprising that the positivist epistemology is based on the traditional approaches which dominate the natural sciences and that its roots lie within an empiricist⁷ philosophy. Conversely, anti-positivist researchers reject empiricism and exclusively scientific methods of social enquiry (Bryman, 2004). They believe that the social world can only be understood from the point of view of the individuals directly involved in the activity being studied. Anti-positivist research is a subjective enterprise in which the researcher must occupy the frame of reference of the participant in action (Burrell and Morgan, 1979). The anti-positivist perspective is a broad one and is associated with several schools of thought, including interpretivism, phenomenology and qualitative research.

Interpretivism assumes that an understanding of the social world first requires knowledge of the subject, for example whether it be people, groups or institutions. It recognises that there are differences between people and therefore requires a research strategy which grasps the subjective meaning of action (Hopper and Powell, 1985). Phenomenology examines the nature of a phenomenon, that which makes something what it is or someone who they are. Phenomenological research seeks to understand the nature and meaning of an individual's lived experience (Van Manen, 1990). Like interpretivists, phenomenologists view knowledge as soft, subjective and intuitive, and something that is obtainable through personal investigation and experience. Finally, qualitative research seeks to gather an in-depth understanding of human behaviour and the reasons that govern such behaviour. It includes forms of data collection and analysis that rely on an understanding and that emphasise meanings (Patton, 2002).

⁷ In sociology, the term *empiricism* describes research that emphasises the gathering of facts and observations at the expense of conceptual reflection and theoretical enquiry. It emerged from a philosophical tradition which, in its modern form, developed in the context of the scientific revolution of the Seventeenth Century and subsequently developed in close association with modern science. In sociology, empiricism has been widely adopted as a philosophical approach by those who advocate methodological naturalism, that is the development of sociology as a scientific discipline (Patton, 2002).

4.3.3 Human nature

Assumptions at the level of human nature refer to the extent to which human beings are influenced by their environment or are independent of it. Burrell and Morgan (1979) distinguish between determinism, which assumes that the environment determines human behaviour, and voluntarism, which assumes that human beings are entirely autonomous and free-willed.

Social researchers might incline toward either perspective or they might take an intermediate standpoint 'which allows for the influence of both situational and voluntary factors in accounting for the activities of human beings' (Burrell and Morgan, 1979, p. 6).

4.3.4 Methodology

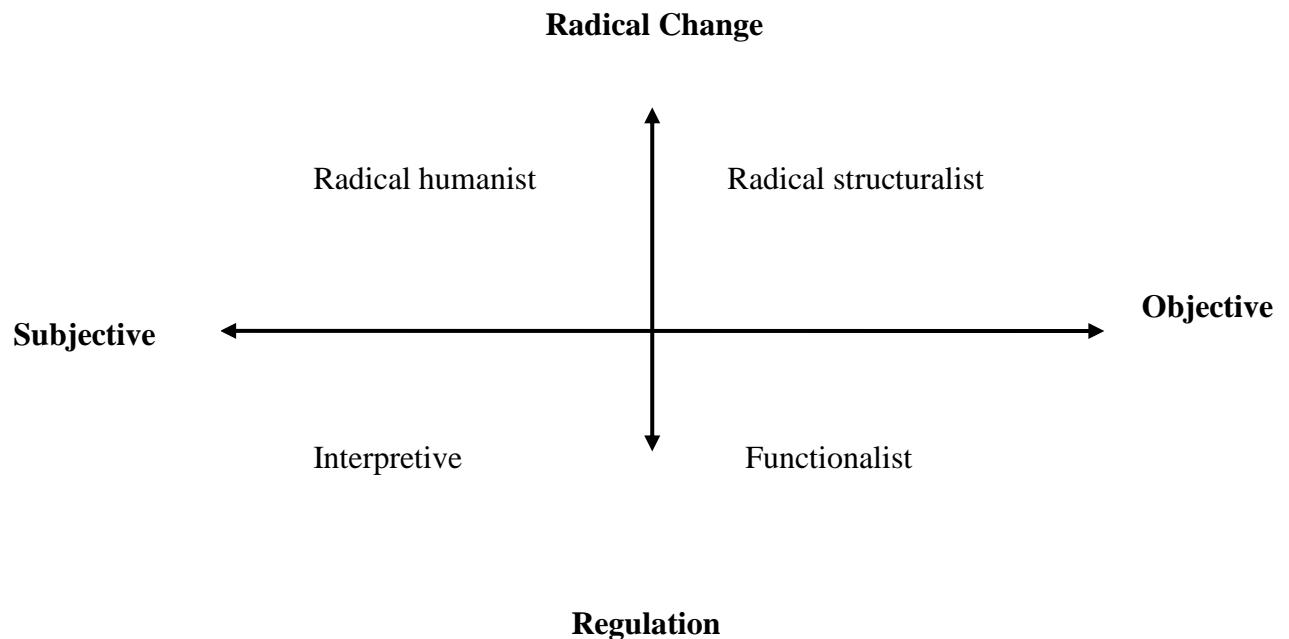
Methodological issues relate to the approaches taken in the process of conducting research. Burrell and Morgan (1979) distinguish between nomothetic and ideographic methods. Nomothetic methods seek to provide more general law-like statements about social life, frequently emulating the logic and methodology of the natural sciences. Ideographic methods, on the other hand, highlight the unique elements of the individual phenomenon. Gill and Johnson's (1997) comparison of the two approaches is presented in Figure 4.1.

The researcher's assumptions at the level of ontology, epistemology and human nature will influence his or her methodological choice. If the social world is assumed to be a hard, external and objective reality, as in the natural sciences, then nomothetic methods will be applied. These methods draw on standard research instruments, such as questionnaires and surveys to collect quantitative-type data, which are then analysed using statistical techniques to identify, explain and predict relationships and regularities among social elements. Alternatively, if knowledge is assumed to be socially constructed and the social world is perceived as soft, subjective and intuitive, ideographic methods will be adopted. For example, observation or in-depth interviews

4.3.5.1 The functionalist paradigm

The *functionalist* paradigm assumes rational human action and rests on the premise that one can understand organisational behaviour through hypothesis testing, much like the natural sciences. Functionalists tend to view social concerns from the perspectives of realism, positivism and determinism and, adopting nomothetic methodologies, will focus predominantly on providing explanations of coordination, integration, cohesion, satisfaction of needs and social order.

Fig 4.2: Four paradigms for the analysis of social theory



Source: Burrell and Morgan (1979, p. 23)

4.3.5.2 The interpretivist paradigm

The *interpretive* paradigm, in contrast, supports the belief that reality is constructed by subjective perception and that, therefore, predictions cannot be made. It holds that human beings cannot be studied using models developed for the physical sciences because humans are qualitatively different from natural events. The interpretive approach to social enquiry tends to be nominalist, anti-positivist and voluntaristic, and

it is carried out using primarily ideographic methodologies. As illustrated by their respective positions on the grid in Figure 4.2, the interpretive and functionalist paradigms both try to explain society as stable, orderly and regulated. However, they see the world from different perspectives; the interpretive stresses the subjective aspect of the world, while the functionalist emphasises its objective features.

4.3.5.3 The radical humanist paradigm

The *radical humanist* paradigm is similar to the interpretive paradigm in as much as it views the world from an anti-positivist perspective. However, its frame of reference emphasises the importance of overthrowing or transcending the limitations of existing social arrangements. Theorists in this paradigm are mainly concerned with releasing the social constraints that limit human potential and they often draw on it to justify their desire for revolutionary change. Consequently, as a paradigm, it is largely anti-organisation in scope.

4.3.5.4 The radical structuralist paradigm

The *radical structuralist* paradigm advocates a sociology of radical change, but from an objectivist perspective. Radical structuralists focus on structural relationships within the social world. They emphasise the analysis of structural conflict, modes of domination, contradiction and domination, ultimately believing that radical change is built into the nature and structure of society.

4.3.5.5 Influence of Burrell and Morgan

Burrell and Morgan's (1979) framework is not without its critics (Chua, 1986; Willmott, 1990; Deetz, 1996), who regard their creation of a mutually exclusive dichotomy between objective and subjective research as too simplistic, resulting in a neglect of cross-paradigm, pluralistic and critical research approaches.⁸ The framework, nevertheless, provides a classification schema that focuses attention on

⁸ The Objective-Subjective debate refers to the distinction between those who view the world as a distinct reality that exists independently of the mind (objectivists), and those who view the world as something that is constructed by the individual (subjectivists) (Ryan *et al*, 2002). This debate is significant and is examined in more detail in Section 4.4.4 of this chapter.

the broad streams of social science approaches to empirical research and it illustrates how a researcher's position on ontology, epistemology, human nature and methodology are implicit in their specific approach to empirical research (Laughlin, 1995). In addition, it went on to inspire a range of accounting-related classifications, one of which is examined in detail in the next section.

4.4 PHILOSOPHICAL PERSPECTIVES OF ACCOUNTING RESEARCH

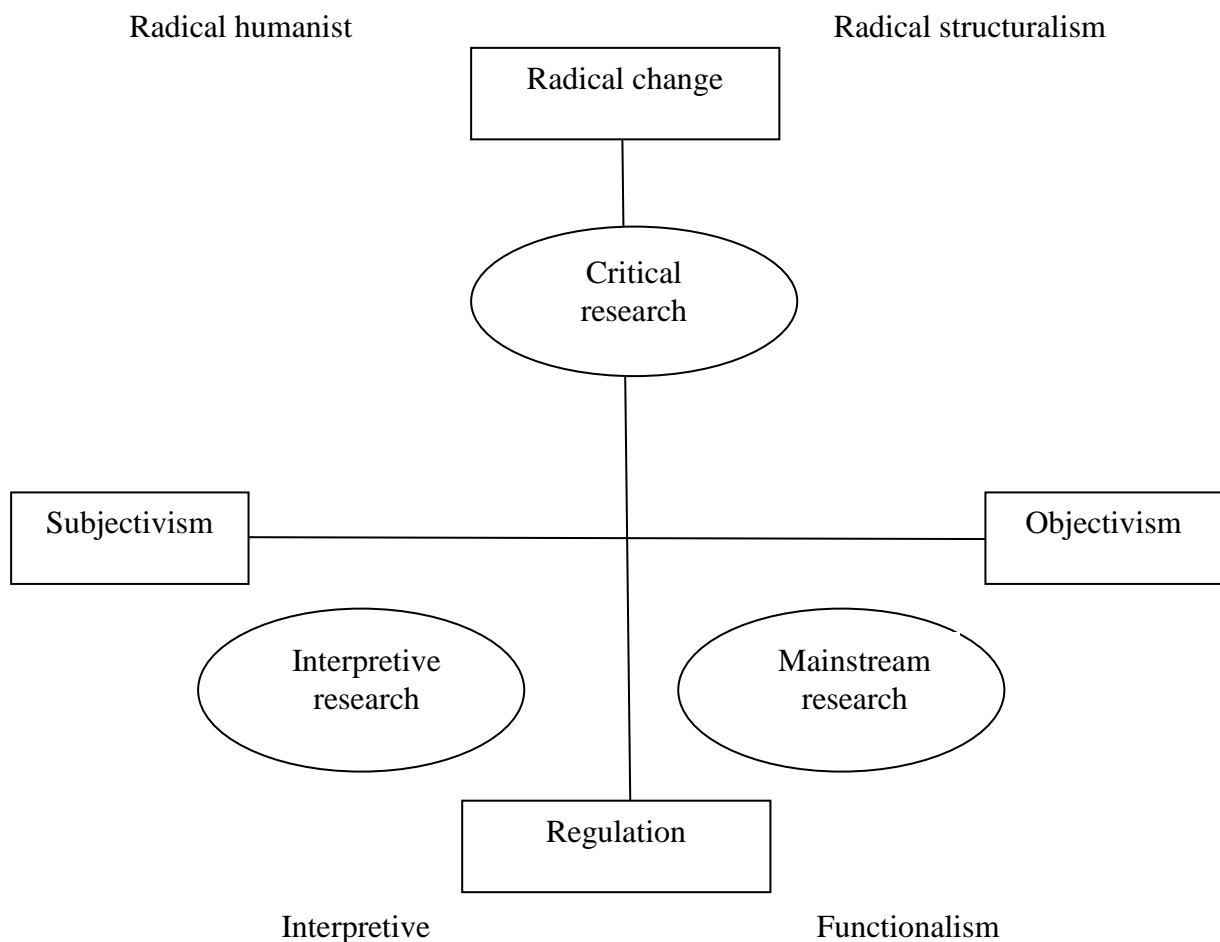
In order to contextualise the philosophical underpinnings of the study, it is necessary to understand the range of philosophical perspectives which have informed accounting research. Until the middle of the twentieth century, management accounting research was largely limited to the basic construction of accounting techniques. The recognition in the 1950s and early 1960s that accounting information should be appropriate to the needs of users led to the development of management accounting as a research discipline, albeit with a normative focus. The 1970s, influenced by both the 'economic' and 'behavioural' wings of the accounting academic community, welcomed the demand for a greater empirical understanding as researchers sought to explore the organisational, social and political roles and influences of accounting practice (Hopwood, 1989; Humphrey and Lee, 2004). Since then, the academic discipline of management accounting has evolved, influenced by developments in wider organisational research as well as by changes in the profession and the wider business environment (Traun and Hughes, 1999).

Accounting academics have adapted theoretical and methodological approaches attributable to key social and political theorists to developing our understanding of accounting (Laughlin, 1995). Hopper and Powell (1985) drew on the work of Burrell and Morgan (1979) to develop a taxonomy of accounting research that provides an overview of research traditions in management and financial accounting. Ryan, Theobald and Scapens' (2002) adaptation of the model is presented in Figure 4.3 in which they distinguish between: (1) mainstream accounting research; (2) interpretive accounting research; and (3) critical accounting research.

4.4.1 Mainstream accounting research

Mainstream accounting research has been characterised by Hopper and Powell (1985) as that which falls within Burrell and Morgan's (1979) 'functionalism' category, meaning that which combines an objectivist view of the world with a concern for regulation. Functionalists believe that empirical reality is objective and external to the subject and the researcher. Theory and observation are held to be independent of each other and quantitative methods of data collection are favoured in order to provide a basis for generalisation (Chua, 1986).

Fig 4.3: Hopper and Powell's taxonomy of accounting research



Source: Ryan et al (2002, p. 40)

Drawing largely from a neoclassical economic framework, a positivist approach to knowledge is evident in much of the management accounting research that took place during the 1980s and 1990s. At the beginning of the 1980s, it became apparent that researchers lacked detailed knowledge of the prevailing accounting techniques in use in organisations. Research emphasis was therefore placed on describing and explaining the nature of management accounting (Scapens, 2006).

Following this tradition, large cross-section surveys have examined the diversity among management accounting practices used in companies (e.g. Clark, 1992; Drury *et al*, 1993; Pierce and O’Dea, 1998), or companies’ success in implementing innovative accounting techniques, such as Activity Based Costing (ABC) or the Balanced Scorecard (e.g. Innes and Mitchell, 1995; Shields, 1995; Innes, Mitchell and Sinclair, 2000).

4.4.2 Interpretive accounting research

Throughout the 1990s, a wider range of theories and methodological approaches were integrated into studies of management accounting practices, extending the theoretical focus of management accounting research from economic theory to include social and organisational theory (Scapens, 2006). Described by some as ‘alternative management accounting research’ (Baxter and Chua, 2003), Hopper and Powell (1985) characterise this as interpretive management accounting research, and as falling within Burrell and Morgan’s (1979) ‘interpretive’ category, the aim of which is to make sense of human actions and the meanings attached to issues in everyday-life contexts (Chua, 1986). Interpretive research recognises that social practices, including management accounting practices, are not natural phenomena but are socially constructed and subject to change by individuals. Interpretive accounting research does not search for universal laws and generalisations as does mainstream research, but rather it seeks to identify the rules which structure social behaviour. These rules are themselves the outcome of that social behaviour, making them recursive, in that they are both a condition and a consequence of social action. This type of research, therefore, requires an exploration of the relationship between day-to-day social action and the

dimensions of social structure. The study of accounting, in this context, requires the detailed examination of accounting practice (Ryan *et al*, 2002).

The research described is distinctly anti-positivist in nature and regards the individual as voluntaristic. It places a greater reliance on qualitative methods of data collection, such as in-depth interviews and case studies, and its emphasis is on exploring how diverse meanings and behaviours emerge through social interaction (Bhimani and Roberts, 2004). Replicability is not an issue with these studies. Results are rarely extrapolated or generalised. Rather, their objective is to develop a richer understanding of an individual situation or circumstance (Patton, 2002). These studies, then, examine how management accounting systems develop over time and seek to understand the organisational and social context in which management accounting systems are embedded (Scapens, 2006).

4.4.3 Critical accounting research

Burrell and Morgan (1979) use the top two quadrants of their framework to distinguish between radical structuralism and radical humanism. The former describes research which views society as shaped by social structures. The latter describes research which places the individual at its centre and views society as the creation of that individual. Hopper and Powell refer collectively to these two types of research as critical accounting research.

Critical theorists examine society and culture. In a management accounting context, a critical theory perspective recognises that accounting systems are more than technical phenomena and that to understand and change them requires an exploration of their social roots (Roslender, 2006).

Critical Theory itself dates back to the 1920s when the German philosopher Habermas, together with his colleagues in the Frankfurt school, constructed it by building on the early writings of Hegel (1770-1831) and subsequently Karl Marx (1818-1883). Marx believed that individual action is conditioned by social structures, in particular, the capitalist social structures that serve the interests of the capitalist

classes. Habermas followed the Marxist tradition in his numerous critiques of social order in capitalist countries⁹. Braverman's (1974) subsequent labour process perspective built on this work. He believed that labour within capitalist organisations was exploitative and alienating, and resulted in workers being coerced into servitude, again demonstrating how social action is determined by social structures. The French post-structuralist philosopher Foucault (1926-1984) explored how power, knowledge and discourse are implicated in social interaction. As discussed in detail in Chapter Three, the British scholar, Anthony Giddens, recognised and further explored these relationships between action and social structures, proposing that structures are both the medium and the outcome of social action, while the French sociologist Bruno Latour's¹⁰ critical theory of technology examines the roles of humans and non-humans in the structuring of society.

The 'critical accounting project', as it became known, was initiated in the University of Sheffield in the mid 1970s when accounting scholars, Tony Lowe and Tony Tinker, began drawing on Marxist theory to examine the sociological implications of accounting. A critical accounting movement followed, with several studies drawing on these critical theories to explore the interconnections between society, history, organisations and accounting theory and practice (Lodh and Gaffikin, 1997). For instance, Berry, Capps, Cooper, Ferguson, Hopper and Lowe (1985) use a distinctly critical approach to demonstrate how management control is constructed and continually reconstructed in practice. Influenced by Braverman's labour perspective, Hopper and Armstrong (1991) re-examine developments made in cost accounting since the 1930s. A range of critical accounting studies also draw on Foucault's concept of 'disciplinary power' to examine the history and social consequences of accounting (e.g. Burchell, Club and Hopwood, 1985; Loft, 1986; Miller and O'Leary, 1987; Hopwood, 1987; Macintosh and Hopper 1991). Macintosh and Scapens (1990) and others draw on Giddens' structuration model in order to understand the social and political dimensions of management accounting. Latour's Actor Network Theory has become a focus for researchers studying the application of accounting procedures in

⁹ Habermas published several works in the tradition of critical theory, most notably 'The Theory of Communicative Action' published in two volumes in 1987

¹⁰ Latour's critical theory of technology is better known as Actor Network Theory, a detailed account of which is available in Latour's (2005) work.

new areas, particularly within the public sector (e.g. Preston, Cooper and Coombs, 1992).

Critical accounting research brings with it a new appreciation of how accounting is implicated in broader social processes and structures. There are clear similarities between the interpretive and critical approaches, in that both acknowledge the subjective value of the world. Interpretive research focuses more on how accounting is socially created and how the perceptions attached to it preserve the status quo. Critical research, on the other hand, focuses to a greater extent on explaining which ideological pressures are influential and which group interests are met by regulation (Hopper and Powell, 1985).

4.4.4 The subjective – objective debate

Burrell and Morgan's (1979) framework distinguishes between the objective and the subjective nature of reality, knowledge and human behaviour. Those with an objective perspective will adopt a realist view of the world, drawing on a positivist epistemology, regarding human nature as deterministic and using nomothetic methods of enquiry. Subjectivists will adopt a more naturalist view of the world. Based on an anti-positivist perspective, they will regard human nature as voluntaristic and will be more inclined to use ideographic methods of inquiry. Burrell and Morgan, however, have been criticised for presenting the subjective approach and the objective approach as a mutually exclusive distinction. To be fair to Burrell and Morgan, it must be acknowledged that, in their discussions at the level of human nature, they did refer to an intermediate standpoint between voluntarism and determinism, which allows for the influence of both situational and voluntary factors in accounting for the behaviour of human beings. However, this is not well reflected in their framework. Hopper and Powell (1985) go some way towards reconciling this split in an accounting context by regarding the line between the subjective and the objective as a continuum, thereby recognising perspectives of reality, knowledge and human behaviour that combine subjectivist and objectivist features.

Debates on the merits and challenges of combining a 'subjectivist insight with an objectivist posture' lie at the heart of what we understand as interpretative management accounting research (Ahrens, 2008, p. 292). Chua (1986) regards any mutually exclusive treatment of subjectivity and objectivity as illogical, preferring to combine research traditions in management accounting instead of emphasising their exclusivity. Kakkuri-knuuttila, Lukka and Kourikoski's (2008) examination of Dent (1991) concludes that interpretative studies cannot be exclusively subjectivist and that objectivist and subjectivist approaches can and must successfully coexist and cooperate. Ahrens (2008) declares the debate to be over, citing several studies that have successfully explained social reality as an emergent phenomenon that is subjectively created and yet is objectified in specific social intercourse (Tomkins & Groves, 1983; Chua, 1986; Ahrens and Chapman, 2006). Kakkuri-knuuttila *et al* (2008) disagree with Ahrens, concluding that more philosophical debate dealing with subjectivist and objectivist positions in management accounting research is needed in order to achieve conceptual clarity.

This subjective-objective distinction mirrors a related debate within social theory regarding the relationship between individual action and social structures. The objective perspective is associated with structuralism, which maintains that social action is wholly determined by social structures. According to this theory, the individual is entirely passive and their behaviour is determined by situational variables. The subjective perspective, on the other hand, relates to individualism, which maintains that all social action is voluntary and that social structures are merely a reflection of individual action (Ryan et al, 2002).

This issue manifests in European social science as the agency/structure debate and has been approached in two primary ways (Kilfoyle and Richardson, 2011). The first is through Practice Theory which discounts the significance of either agency or structure, instead using the notion of practices, which are systems of human activity centrally organised around shared practical understandings (Schatzki, 2001, 2003). The second approach is through Structuration Theory, which is examined in detail in Chapter Three but is discussed briefly in the next section in the context of the overall agency/structure debate.

4.4.5 Structuration Theory- a mediating concept

Structuration Theory regards agency and structure as a mutually constitutive ‘duality’ and contends that, during agency, individuals draw on norms and institutionalised knowledge to produce social order, or structures, thereby simultaneously reaffirming and reasserting those norms and institutionalised knowledge as modalities of that social order (Giddens, 1984). Margaret Archer argues that Giddens’ notion of ‘duality of structure’ conflates agency and structure, with the result that structures appear only to be a product of contemporary practices.¹¹ Her morphogenetic approach argues that at any particular moment existing structures are both constraining and enabling agents, whose interactions produce intended and unintended consequences, and these lead to structural elaboration and the reproduction or transformation of the initial structure. The resulting structure then provides a similar context of action for future agents (Archer, 1995, 2000, 2003). Rob Stones’ more recent development of Structuration Theory embraces the temporality implied in Archer’s approach in that he accepts that structures may precede action, which leads to structural outcome, which provides the precondition for further action. However, he criticises Archer’s assumption that structures are always in some way external to the agent. He therefore distinguishes between external structures, which provide agents with their conditions of action, and internal structures, which refer to the agent’s internal knowledgeability. Stones’ model recognises the effect of action and interaction on both external and internal structures (Stones, 2001, 2005).

Ultimately, Structuration Theory attempts to resolve the agency/structure dualism, that is, the split within the social sciences between those who consider social phenomena to be products of the action of human agents in light of their subjective interpretation of the world, and those who consider social phenomena to be caused by objective social structures. It attempts to forge a middle ground between these two extremes by proposing that structure and agency are not independent conflicting concepts but are in fact a mutually interacting duality (Jones, 1999, p.104). Ryan *et al* (2002) illustrate the relationship between agency and structure by referring to the use of language. When an individual speaks, he draws on the grammatical structure of

¹¹ Structuration Theory and the influence of Margaret Archer in more recent developments in Structuration Theory are set out in detail in Chapter three.

language. Language, as a structure, is created and recreated every day through these speech acts. Consequently, changes in these speech acts will bring about changes in the language. In this sense, human agency is inherently subjective but it creates social structures which become externalised and capable of objective analysis.

The next section will contextualise the broad theoretical overview provided in Sections 4.3 and 4.4 by clarifying the philosophical underpinnings of the study and linking this philosophical perspective with the theoretical lens through which the study is conducted.

4.5 PHILOSOPHICAL UNDERPINNINGS OF THE STUDY

As set out in the previous section, Burrell and Morgan (1979) present four cascading groups of assumptions which combine to present four distinct paradigms of social research. For convenience, these are summarised in Table 4.1.

Table 4.1: Summary of Burrell and Morgan’s assumptions

Ontology (nature of <i>reality</i>)	Realism	Nominalism
Epistemology (nature of <i>knowledge</i>)	Positivism	Anti-positivism
Human Nature (nature of the <i>individual</i>)	Determinism	Voluntarism
Methodology (nature of <i>empirical inquiry</i>)	Nomothetic	Ideographic

Subsequent developments of Burrell and Morgan’s model reflect how research in the social sciences in general, and in accounting in particular, have embraced cross-paradigm and pluralist research approaches (Hopper and Powell, 1985; Loughlin, 1995). Nevertheless, these polarised positions, while simplistic, provide an effective starting point from which to discuss a researcher’s philosophical perspective.

This study explores the role of accounting information in NPD. The study’s ontological position could be classified as mid-way between nominalism and realism, as it integrates objectivist elements of the manager’s environment with subjectivist features of the manager within that environment. The study’s epistemological position

is oriented toward anti-positivism as it is carried out from the perspective that the social world being investigated, that is the NPD environment, can only be understood from the perspective of the managers directly involved with it. It adopts an intermediate standpoint between determinism and voluntarism as it recognises the influence of both situational and voluntary factors in understanding the activities of those managers. Burrell and Morgan combine these four sets of assumptions with the researcher's perspective on 'society', differentiating 'regulation' from 'radical change', the latter referring to the extent to which an investigation is intended to achieve change in the phenomena being investigated. This study's examination of the role of accounting information is more oriented towards 'regulation' than 'radical change'. The collective consideration of these issues would place this study in Burrell and Morgan's interpretive paradigm and, similarly, in the interpretive category of Hopper and Powell's (1985) subsequent framework. This research approach will facilitate an exploration of the use of accounting information as a social practice within an NPD context.

Within the interpretive paradigm, the study could have drawn on several theoretical perspectives. It originally set out by drawing on the institutional model developed by Burns and Scapens (2000) but this appeared to give insufficient emphasis to the role of the agent in building and reinforcing institutionalised rules and routines. It was this limitation in the institutional model, for the purpose of this particular study, that led the researcher to Structuration Theory, which emerged as a particularly appropriate model with which to explore the social world of the NPD environment. Structuration Theory combines two antagonistic theoretical perspectives, that of structuralists, who perceive social life as being determined by impersonal and objective social structures and that of hermeneutic humanists, who perceive social life as being the product of subjective and human activity (Macintosh and Scapens, 1990). In this sense, it equally positions agents and structures, that is people and practices, at the centre of its analysis. This is particularly appropriate in an examination of an NPD environment which contains both structures and agents in a dynamic mutually constitutive relationship, with neither appearing to presuppose the other.

As outlined in Section 4.4.3 Structuration Theory originally emerged from the school of critical research when Anthony Giddens, influenced by Marxist traditions as well as by the French and German critical theorists, developed the theory in order to explore how power, knowledge and discourse are implicated in social interaction. Giddens himself originally developed it as a critical theory, designed to have an ideological impact and bring about societal change (Ryan *et al*, 2002). As discussed in Chapter Three, Stones built on Giddens original construct so that it would have more resonance in empirical contexts, moving away from Giddens' 'ontology in general' to what Stones himself refers to as 'ontology in situ'. This involves taking Giddens', admittedly abstract, theory and pointing it toward particular concrete situated entities with their particular qualities, relations, shapes, tone, texture and colour (Stones, 2005, p. 76). This is the spirit in which Structuration Theory is being utilised in this study.

The next section presents a detailed account of the study's research design.

4.6 RESEARCH DESIGN

The nature of the research problem is paramount in determining the research design (Abernethy, Chua, Luckett and Selto, 1999). Rather than aiming to identify the frequency or incidences of the use of accounting information, this study seeks to provide a deep and rich understanding of the social nature of the use of accounting information. It is important to explore the human behavior surrounding accounting information use, specifically how an individual's situational surroundings and human interactions influence that behavior. This is why a qualitative research approach was necessary. Hakim (2000) describes qualitative research as offering a 'worm's eye' as opposed to a 'bird's eye' view of a phenomenon:

Qualitative research is valuable for identifying patterns of associations between factors on the ground, as compared with abstract correlations between variables in the analysis of large scale surveys and aggregate data (p. 37).

Qualitative enquiry offers a holistic perspective which is capable of capturing the complexity inherent in the phenomena being investigated (Patton, 2002). In a management accounting context, Vaivio (2008) describes qualitative research as a

‘messy and time-consuming affair’ (p. 64) but, in spite of this, a necessary and timely counterweight to the ‘textbook idealisations, formalised economic models and consultancy products’ (p. 81) which have dominated management accounting research for much of the past sixty years.

4.6.1 Case study research

Given the inductive nature of this study, an explanatory case study approach has been selected as the most appropriate research method. Explanatory case studies attempt to explain the reason for observed accounting practices. Theory is used in order to understand the specifics, rather than to produce generalisations (Ryan *et al*, 2002).

Stones’ re-enforced model of Structuration Theory is considered particularly well-suited to case study research in accounting, organisation and management (Jack and Kholeif, 2007; Coad and Herbert, 2009). Taking a broad view of the NPD process and the managers involved in a particular organisational setting and examining how they draw upon their conjuncturally specific structures of signification, legitimation and domination, and how these are affected by the managers’ external structural conditions and their general dispositional frames of meaning, will facilitate the development of an in-depth understanding of managers’ behaviour during NPD.

Case studies have emerged in recent years as a commonly adopted research method in interpretative management accounting research (see for example Scapens and Jazayeri, 2003; Burns and Baldvinsdottir, 2005; Quattrone and Hopper, 2005; Byrne and Pierce, 2007; Lukka, 2007; Kakkuri-Knuuttila *et al*, 2008 and Quinn, 2010). Although the case study approach presents challenges in terms of maximising the reliability and the validity of a study’s findings (Yin, 2009), it is consistent with the aim of this study which is to explore the role of accounting information in NPD in a particular organisational context. A case study approach will facilitate a detailed exploration of the human actions and interactions surrounding accounting information use.

4.6.2 Merits of case study research

The overwhelming advantage that case study research offers over alternative approaches to qualitative enquiry is its contextualised and holistic nature. It allows for the study of accounting as part of the broader organisational and social systems of which it is a part (Ryan *et al*, 2002). This is consistent with the methodological underpinnings of this study which, as set out in Section 4.5, are based on the search for both the situational and the voluntary factors associated with managers' use of accounting information during NPD.

In addition, the case study approach facilitates the gathering of data from multiple sources, thereby enabling the ongoing analysis of contradictory and corroboratory evidence. Its flexible and adaptable nature, typically because the researcher is on-site, facilitates prompt elaboration or clarification on any point of enquiry as well as considerable scope to pursue unexpected findings (Yin, 2009).

4.6.3 A single case design

A key issue for any researcher when undertaking case study research is deciding whether to pursue a single case or multiple case design, since each will require different design considerations. Yin (2009) presents five rationales for pursuing a single case strategy. These are set out in Table 4.2:

Table 4.2: Rationales for single case strategy

Rationale	Description
Critical case	A case where clear circumstances exist which may confirm, challenge or extend the relevant theory
Extreme case	A case unique in nature
Representative case	A case which captures common occurrences
Revelatory case	A case in which previously unobserved phenomena may be observed
Longitudinal case	A case which may be observed over several time periods

Within a single case, Yin (2009) also distinguishes between a holistic case study, which involves investigating an organisation at a global level, and an embedded case study where attention is given to a unit or a range of sub-units. The sub-units within an embedded case study often enhance insight into the case, bringing about significant opportunities for extensive analysis. However, the researcher must be careful not to ignore the larger, holistic aspects of the case. These issues will be revisited when the case site for this study is introduced in Section 4.7.2.

4.6.4 Challenges of case study research

The most fundamental issue that any field researcher must confront is the ability to gain access to the field, in this area of research this means an ability to gain access to contemporary organisations (Baxter and Chua, 1998). Frequently, this access is dependent on the opportunism of the field researcher (Buchanan, Boddy and McCalman, 1988). Case study research presents further challenges in terms of negotiating ongoing access or, possibly, renegotiating access (Ahrens, 2004). Baxter and Chua (1998) recommend having the project approved at the highest level in the organisation in order to reduce the risk that access will be terminated prematurely. Ahrens (2004) recommends that a researcher should be prepared to refine the research design opportunistically and should therefore never consider any part of the case study as completely ‘done’.

Case study research is frequently criticised due to the perception that findings cannot be generalised, a criticism directed at single case study research in particular (Bryman, 2004). While it is possible that some predictive ability may emerge from case study research, more often it leads to a deeper insight into a social process which enhances our understanding of similar processes in other contexts and settings (Berry and Otley, 2004). Such moderate ‘generalisation’ would not be statistically inferred, but would be ‘theoretical or analytical’ in nature (Lukka and Kasanen, 1995, p. 77). Lincoln and Guba (1985) refer to this aspect as transferability of findings, concluding that ‘the only generalisation is: there is no generalisation’ (p. 110).

Darke, Shanks and Broadbent (1998) discuss the difficulties associated with the influence the researcher has on data collection and analysis. Both will be subject to the influence of the researcher's own characteristics and background and this possibility for bias may threaten the validity of the findings. Scapens (2004) identifies four possible roles for a researcher in a case study: (1) the outsider, who relies on readily available secondary evidence; (2) the visitor, who visits the case site and interviews the subjects of the research; (3) the facilitator, who is more closely involved in the case site, specifically in raising issues, giving advice and providing options for the subjects of the research to evaluate; and (4) the actor, who is a key player in the subject being investigated, possibly introducing a new technique or procedure. The most common role is that of the visitor who, with the exception of the outsider, has the least potential to influence the case yet still cannot be considered independent. The output of the case study will reflect the visiting researcher's interpretation of the data thereby rendering it inevitably subjective.

4.6.5 Reliability and validity

Ultimately, every researcher must convince the reader of the credibility of their findings. The two key concepts relevant to any discussion on the credibility of research findings are reliability and validity (Silverman, 2009).

Reliability means that if the analyses were to be repeated by a different analyst, he would arrive at the same results. Such reliability is easier to guarantee in relation to quantitative analysis because a quantitative analysis can be reproduced quite easily given the standardised nature of most statistical operations. This proves to be more difficult in relation to qualitative analysis where the analyses techniques are not quite so structured and standardised (Punch, 2005).

Validity means the extent to which the findings may be considered 'true'. It may be broken down into internal validity and external validity. Internal validity addresses the internal logic and consistency of the study. In quantitative research analysis, this concerns the extent to which the relationship between the variables is correctly interpreted. In qualitative research analysis, it addresses the extent to which the

findings represent reality. External validity, on the other hand, addresses the question of generalisability. It questions the extent to which the findings are generalisable to a wider population (Punch, 2005). The conclusions of case study research are often highly contextualised which threatens their external validity. However, as discussed in the previous section, case study results are subject to analytical generalisation whereby the researcher strives to generalise results to a broader theory or analytical domain. In this sense, the external validity of case study research is as important as it is for alternative types of research (Yin, 2009). Punch (2005) suggests that the best way to increase the reliability and validity of qualitative findings is to document the data gathering process and the data analysis methods which were used in as much detail as possible in order to expose them to the maximum amount of scrutiny. A detailed account of the data gathering stage of this study is set out in Section 4.7 below. The qualitative data analysis carried out in this study is presented in Sections 4.8 to 4.10. The measures taken to maximise the reliability and validity of the findings are referred to throughout these sections. However, before discussing them in detail the next section sets out a brief chronology of the key phases of data gathering and data analysis carried out during the study.

4.6.6 A brief chronology of the case study

The study initially set out to examine the role of the accountant in NPD. The initial literature review revealed a shortage of studies examining this issue and so an exploratory interview was conducted at quite an early stage in the study's research process in order to develop an insight into the relevant themes and issues. The analysis of this exploratory interview is described in Section 4.8. A key aspect of these exploratory findings were that the role of accounting information in NPD emerged as far more critical than the role of the accountant in NPD. This resulted in a refinement of the study's research objective to focus less on the role of the accountant in NPD and more on the role of accounting information in NPD.

Another key aspect of the exploratory findings was that the use of accounting information during NPD was not prescriptive or normative and was not aided by SMA techniques. Accounting information is very specific to the individual using it

and is influenced as much by the individual's motivations and attitudes as it is by the information's prescriptive qualities. This recognition of the social implications of accounting information use led the researcher to examine Structuration Theory as a theoretical framework with which to develop the study.

The exploratory findings leading to the refined research objective followed by a now detailed understanding of Structuration Theory justified the selection of a case study approach as the most appropriate research method with which to achieve the research objective. In the subsequent three years the researcher returned to conduct interviews and gather internal documentation in Metbuild, in Metbuild's sister company Topwood, as well as at the parent company. This is discussed in detail throughout Section 4.7.

The data analysis of the case study consists of two phases. Section 4.9 describes the first phase of data analysis which resulted in the development of a detailed description of the case site, the process of developing new products in the case site and the use of accounting information in the development of new products. Section 4.10 presents the second phase of data analysis which applies Stones' composite research strategy to the case data in order to achieve a greater depth of insight into the findings.

4.7 DATA GATHERING

Case study materials gathered during the period 2007-2011 include interviews carried out by the researcher, site tours, e-mail correspondence from throughout this period and the collection of documentary evidence. Access for any form of observation was not forthcoming from the outset of the case study. However, interviews are a valuable means of enquiry within the context of a case study. They provide an insight into feelings, thoughts and intentions that few alternative qualitative data-collection methods will facilitate (Patton, 2002). The remainder of this section details the steps taken in the study's data collection process, each of which was carried out with due cognisance of the challenges of case study research outlined above.

4.7.1 Case site selection

In selecting a company in which to conduct the case, the key criteria were that the company was in the manufacturing sector and that it was engaged in NPD. At the outset of the research, five potentially suitable case sites were identified through the researcher's personal contacts. The researcher had no personal involvement with, and had never worked in, any of the five companies. The opportunism of the field researcher has been identified as a useful option in securing access to the field (Buchanan, Boddy and McCalman, 1988; Baxter and Chua, 1998). Initial contact was made with all five. Three refused access beyond the first meeting due to what they believed was the competitively sensitive nature of the issues being investigated. The fourth was happy to grant access beyond the initial contact but, unfortunately, the company's Irish operation was closed six months after the first meeting. The researcher approached the UK operation which was taking over manufacturing from Ireland but was refused access. The fifth, Magma, progressed to a full case study.

Magma is a large Irish-owned group with three divisions: Natural Resources, Enterprise and Manufacturing. The Manufacturing division – Magma Manufacturing Division (MMD) - consists of two companies: Topwood and Metbuild. Refer to Appendix A for an illustration of Magma's group structure. Interviews were conducted with managers in Topwood and Metbuild, in the divisional entity, MMD, and at Magma's overall group headquarters. This facilitated an embedded case study in Magma. Figure 4.4 sets out the individuals interviewed in each company.

4.7.2 Initial and ongoing access to case site

A contact name and e-mail address for the Magma Group's Chief Financial Officer (CFO), Ian, was acquired through personal contacts. An initial e-mail was sent describing the academic nature of the study and indicating the type of access required. A follow-up phone call was then made during which the CFO agreed to introduce the researcher to relevant individuals throughout the organisation. Baxter and Chua (1998) recommend seeking approval at the highest level possible in order to minimise future access restrictions. Throughout the case study, Ian performed as both

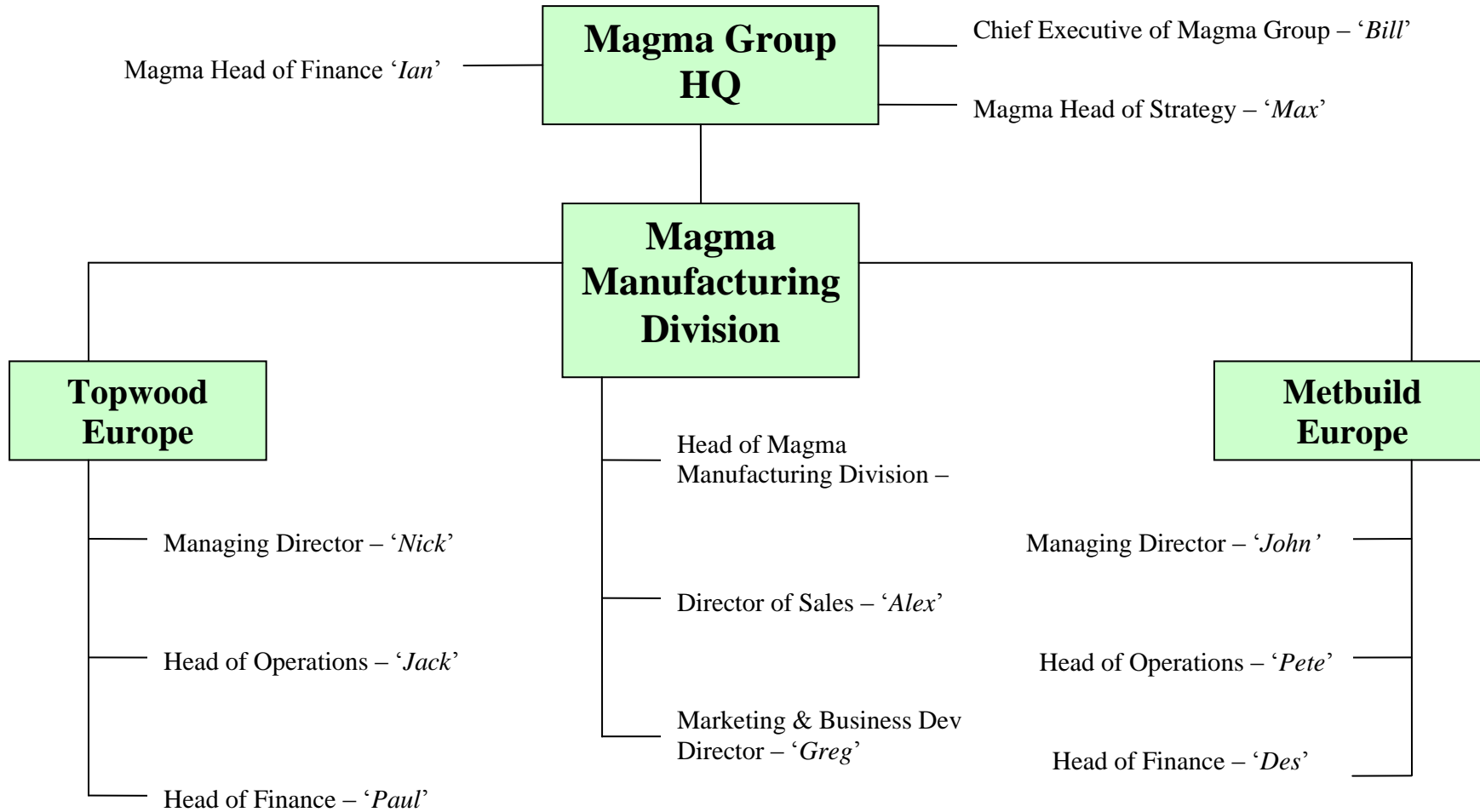
gatekeeper¹² and informant, a gatekeeper being an individual who can open or close the gate for the researcher while the informant can provide valuable information and can frequently facilitate introductions to other relevant personnel (Gummesson, 2000).

At the outset, the company and everybody who participated in the study were guaranteed their anonymity. The names of the group, the divisions, the companies, products, projects and all interviewees have been changed. When all interviews were being arranged, interviewees were provided in advance with a document which identified the title of the study, the university department involved, and the academic qualification being sought. The document also advised interviewees as to the expected extent of their involvement, specifically in terms of participation in interviews and the estimated time commitment involved. Interviewees were guaranteed confidentiality at all times and were advised that interview recordings and transcripts would be destroyed three years after completion of the study. The document also confirmed that the interviewees' involvement in the case study was voluntary and that they were free to withdraw from the study at any point. Interviewees were also provided with a brief overview of the topics which would be discussed during the interview.

Ian provided the researcher with a telephone number for Metbuild's Head of Finance, Des. Ian also agreed to mention the research to him in advance of the call. Arrangements were subsequently made to visit Metbuild's plant and meet with the company's Head of Finance, Des, and Head of Operations, Pete. The researcher adopted a 'visitor' role (Scapens, 2004). Upon arrival, the researcher received a plant tour followed by an exploratory interview for one and a half hours, one hour of which was with both Des and Pete together and thirty minutes of which was with Pete alone. The researcher was also provided with internal company documentation. After the visit to Metbuild, a phone call was made to Ian to thank him after which he e-mailed the researcher several further items of internal company documentation.

12 Ian was considered an appropriate gatekeeper because his role at Magma headquarters facilitated introductions throughout the group and was at the same time sufficiently distanced from NPD at Topwood and Metbuild that his role as gatekeeper would not introduce any bias into the findings.

Fig 4.4: Case Study Map



The interview in Metbuild and the telephone conversations with Ian were exploratory in nature. The analysis of this data is dealt with specifically in Section 4.8. The findings contributed to a significant refinement of the research objective and a comprehensive search for the appropriate theoretical foundation for the study in the ensuing period. This time was also used to learn as much as possible from the data gathered about Magma, the overall group structure, the MMD division incorporating Topwood and Metbuild, the division's products and markets as well as the key personnel in each company.

Having refined the research objective, clarified the study's theoretical foundation and developed a clearer understanding of the case-site it was decided that interviews must be conducted with managers in Finance and Operations in both Topwood and Metbuild. These managers must be involved in NPD in some way and they must be at sufficiently high a level in the organisation that they contribute to decision-making at some stage throughout NPD. A follow-up phone call was made to Ian during which he identified the relevant personnel in each company. As a starting point he provided the researcher with a telephone number for Topwood's Head of Finance, Paul. Again, Ian agreed to mention the research to him in advance of the call. Arrangements were subsequently made to visit Topwood's plant. Upon arrival, the researcher was given a plant tour and then conducted interviews, lasting approximately one hour each, with the company's Head of Finance, Paul, Managing Director, Nick, and Head of Operations, Jack, who also provided the researcher with internal company documentation. Shortly afterwards, the researcher returned to Metbuild to conduct interviews with the comparable personnel in Metbuild. This led to interviews with the Head of Finance, Des, Head of Operations, Pete and the Managing Director, John. The nature of the research design means that it was also necessary to gather the insights of managers at MMD and Magma group level. Once the interviews at Topwood and Metbuild were concluded the researcher requested interviews with senior management at MMD, as well as the Head of Strategy and Chief Executive of the Magma group. Contact details were provided by CFO, Ian and the researcher visited MMD's UK offices and the Magma Group headquarters to conduct these interviews several times during the subsequent year.

Qualitative enquiry design cannot always be wholly specific in advance of the study. Often the design unfolds as the fieldwork unfolds (Patton, 2002). As the study progressed, it became possible to conduct an embedded case study which facilitated the analysis of two units of analysis, namely Topwood and Metbuild. The opportunity to compare the perspectives of managers in both companies offered an enhanced insight into NPD in Magma, yet the interviews with managers in MMD and Magma ensured that the larger, holistic aspects of the case were not ignored.

4.7.3 Design of interview guide

Interviews generally fall into one of three categories: structured, semi-structured and unstructured. Semi-structured interviews were considered the most appropriate form of interview for this study because they allow the researcher to probe the meaning that specific interviewees attach to issues and situations and explore how these meanings influence their behavior. This is in keeping with the study's overall research design which seeks to provide an understanding of the social nature of accounting information use. Semi-structured interviews are characterised by having an overarching topic, some general themes, targeted issues and a range of specific questions, while still giving the interviewer the flexibility to pursue matters as circumstances dictate (Lee, 1999). Kvale (1983) describes semi-structured interviews as neither a 'free conversation nor a highly structured questionnaire' (p. 174). Interviews of this nature are consistent with the often emergent nature of case study research during which it is not unusual for new issues to arise as the research progresses (Humphrey and Scapens, 1996; Scapens, 2004).

An interview schedule was used as a basic guideline during the interviewing to make sure that all relevant topics were covered, to provide direction for the questioning and to help the researcher to conduct the interview in a systematic way. Supplementary questions were asked when initial responses needed elaboration or when new issues emerged during the course of the discussion.

The initial interview with Des (Head of Finance) and Pete (Head of Operations) in Metbuild in 2007 was, as discussed in Section 4.7.2, exploratory in nature. The

interview guide was therefore informed by a preliminary review of the literature and by a general research objective which, at the time, was to explore the role of the accountant in NPD. Questions tended to be open-ended and were designed to uncover general themes and issues worthy of further research. The major areas covered in the interview guide are as follows:

Company background

- Interviewee's role and responsibilities
- NPD
- Involvement of Finance in NPD
- Attitude to/of Finance generally

A copy of this interview guide is included in Appendix B.

This exploratory interview proved to be a critical phase of the study. Following this interview, the researcher engaged in a more extensive literature review which included the search for an appropriate theoretical framework. This critical review of the literature, combined with an examination of the exploratory data collected in 2007, led to the development of the study's research objective as well as the decision to use Structuration Theory as the theoretical framework on which to base the study. The researcher returned to the case site with a revised interview schedule which was designed with due consideration of the refined research objective and the theoretical framework underpinning the study.

The major areas covered in the revised interview guide are as follows:

Company background

- Detailed description of interviewee's role, responsibilities and background (educational, career, etc...)
- Detailed account of NPD including interviewee's involvement in NPD
- Detailed description of interviewee's use of accounting information in NPD
- Role of accounting information in NPD decision-making
- Attitude to and level of satisfaction with role of accounting information and Finance in NPD
- Degree of financial literacy

Interviewees were always invited to discuss any other issues which had not arisen during the interview but which they perceived as important in terms of the subject matter. These interviews searched for more depth than the exploratory interview. Their purpose was to explore the role of accounting information in NPD from the interviewee's own perspective and to search out factors, conditions and circumstances which might be associated with that perspective. The interview schedules were tailored slightly to managers at different levels and in different functions but they broadly covered the main areas. Copies of the interview guides used for all of the interviews conducted between 2009 and 2011 are included in Appendices C to H.

4.7.4 Conducting the interviews

Face-to-face interviews of approximately sixty-minute duration were conducted with each manager at their own premises. All interviewees granted permission for recording of the interviews. There are advantages and disadvantages associated with recording the interviews. It undoubtedly results in more data than could be obtained from simply mentally recalling the interview (Taylor and Bogdan, 1998) and it frees the interviewer from continuous note-taking thereby allowing greater concentration on the interview responses (Patton, 2002). However, the presence of a recording device might intimidate the interviewee (King, 1994) and can cause lapses in the interviewer's concentration (Brownell, 1995). Despite these potential drawbacks, it was decided that the advantages outweighed the disadvantages and, consequently, all interviews were digitally recorded and subsequently transcribed verbatim by the researcher. During each interview, additional notes were taken to record issues such as setting, reaction to questions, body language and rapport between interviewer and interviewee.

Patton (2002) describes the post-interview period as a time of quality control to ensure that the data gathered is correct and reliable:

The period after an interview or observation is critical to the rigour and validity of the qualitative findings. This is a time for guaranteeing the quality of the data (Patton, 2002, p.383).

After each interview, further notes were added as part of a brief post-interview review recording observations made during the interview as well as emerging thoughts and

ideas. Patton (2002) advises that these will later provide a context in which to interpret the findings. They also assisted in preparation for the next interview.

4.7.5 Company documentation

Documentary evidence provides a rich source of insight into interactions and communications between individuals and groups at all levels of the organisation (Forster, 1994). Magma supplied copies of completed NPD project documentation, project documentation for projects in progress and project documentation for deferred projects. In addition, the company supplied a wealth of internal information memorandums and board reports, which were crucial to the development of a sound understanding of the case context.

Yin (2009) recommends the use of a case study database. This is a central repository where all case study data are stored. In principle, this means that another investigator can access and review the evidence directly without the need to review written reports. The researcher maintained a database of all case study documentation (with soft-copy back-up where possible). The content of the case study database, including the date each document was entered in the database, is included in Appendix I.

One of the most important functions of documentary evidence is to corroborate findings from other sources of data (Bryman, 1989). In this study, documentation was a particularly useful tool when searching for more detail and depth during interviews and when probing interviewees' responses.

4.8 ANALYSIS OF EXPLORATORY INTERVIEW IN 2007

This interview was conducted with Metbuild's Head of Finance and Head of Operations. It lasted one and a half hours, one hour of which was spent with both managers at the same time, with the last thirty minutes being conducted with the Head of Operations on his own. Original arrangements were made to interview each manager separately but the Head of Finance decided to sit in on the interview with the Head of Operations and there was no opportunity to meet with the Head of Finance again that day. As it was an initial interview the researcher decided to be led by the

interviewees in this regard. However, the combined interview presented an interesting opportunity to observe how each manager reacted to each other's responses. It was also possible to observe if the attitude of the Head of Operations changed when the Head of Finance left the room. Despite being a little more open, his attitude did not change significantly. All subsequent interviews throughout the case were carried out with each manager individually.

The interview schedule used is presented in Appendix B. The interview was very exploratory in nature and the questions were relatively open-ended. During this interview, the researcher was provided with some internal company documentation which provided a wider context although the interview transcript was the most significant piece of data. This transcript was prepared immediately after the interview was conducted. It was read in combination with the documentation received and a summary was prepared. The transcript was read, reread and reflected upon on an iterative basis for some time until, ultimately, five key issues were identified which were significant in terms of informing the next stage of research. These were

1. The existence of a formal NPD process was critical to the successful development of new products.
2. The Finance function had little or no involvement with the NPD process. The involvement of the Finance function in the NPD process was complex and difficult to decipher.
3. The Head of Operations provided as much insight into the accounting information used within the process as the Head of Finance.
4. SMA techniques were either not being used or were not recognised as such.
5. The Head of Operations' reaction to accounting information appeared to be influenced by his attitude to Finance, his attitude to Metbuild's parent company and Metbuild's competitive market.

As set out in Section 4.6.6, these exploratory findings led to a significant refinement of the research objective as well as the selection of Structuration Theory as a theoretical framework with which to develop the study.

4.9 PHASE 1 OF THE DATA ANALYSIS

This refers to the first phase of analysis of the overall case study. Data analysis began after each interview when the transcripts were prepared and the interview notes and company documentation were reviewed. Wherever possible, the researcher triangulated between interviews and documentary evidence or between interviews with different managers. Sometimes clarifications were sought from the interviewees by e-mail or telephone. This was particularly necessary if an interviewee's response did not corroborate with an item of documentation. An interview summary was written shortly after each interview.

In early 2011, when all of the interviews were complete, the final transcripts and notes, together with all relevant company documentation, were reviewed together. This period of review was lengthy as it involved continued rereading and reflection on the transcripts and documentation. With the research objective in mind, observations and thoughts regarding potential issues or themes were recorded on the right-hand margins of the transcripts and notes themselves. In addition, an analysis document was written discussing the key issues emerging from this period of reflection and review.

The next step in this data analysis process was the development of a rich and detailed description of the case site, the process of developing new products in the case site and the use of accounting information in the development of new products. The results of this phase of the data analysis are presented in Chapter Five at the conclusion of which a number of key observations are made regarding the use of accounting information in NPD. It was clear that these findings needed to be explored in more depth. The next phase of data analysis is described in the next section.

4.10 PHASE 2 OF THE DATA ANALYSIS

This refers to the second phase of analysis of the overall case study and is based on Structuration Theory, the theoretical framework underpinning the study. As set out in Chapter Three, Giddens introduced the notion of ‘methodological bracketing’ believing it be the only way in which Structuration Theory could be operationalised as a framework for empirical research. When Giddens performed institutional analysis, he bracketed off the agent’s conduct, effectively ignoring the agent’s internal skills, awareness and knowledgeability and treating institutions as chronically-reproduced rules and resources that are unaffected by the agents drawing on them. When analysing an agent’s strategic conduct, he bracketed off the corresponding institutional context, placing in suspension any notion that institutions are socially reproduced. Giddens was criticised for pushing this bracketing too far and creating too much of a distinction between agency and structure, effectively reintroducing the dualism which Structuration Theory had initially set out to eradicate (3.3.3). Stones addresses this criticism by replacing Giddens’ analysis of strategic conduct with his broader notion of conduct analysis, which examines an agent’s internal knowledgeability on two levels: dispositional and conjunctural.

The analysis of an agent’s dispositional frame provides insight into his ordering of concerns, hierarchy of purposes, motives, desires and attitudes, while the analysis of an agent’s conjunctural frame concerns the rules, norms and interpretative schemes the agent draws on when he engages in specific roles or tasks. These conjuncturally specific structures provide the critical link between an agent’s internal and external structures, as the analysis of the agent’s conjunctural internal structures leads us through the agent into his external terrain. Context analysis turns the entire analysis outwards, examining this external terrain and institutional position practices. Instead of placing the institutional context in suspension, the combination of context and conduct analysis seeks to explore the interaction between this external terrain and the agent’s internal knowledgeability (3.4.6). In the interests of providing methodological guidance to researchers in the field, Stones presents a series of recurrent steps which, when applied, should lead to an in-depth understanding of specific phenomena in a

particular time and place (Stones, 2005, p. 123). These recurrent steps include the following:

- Step 1: Within the bracket of conduct analysis, identify the general dispositional frames of meaning of an agent-in-focus.
- Step 2: From within these general dispositional frames of meaning, identify the conjuncturally specific internal structures of that agent-in-focus. This will reflect how the agent perceives his immediate external terrain from the perspective of his own project, role or task.
- Step 3: Within the bracket of context analysis, identify the relevant external structures, the position practices that routinely constitute them, the authority relations within them and the material resources at the disposal of the hierarchically-situated agent.
- Step 4: Specify the possibilities for action and structural modification allowed by the identified external structures.

4.10.1 Selection of agents-in-focus

The objective of this study cannot be addressed by simply exploring the relations between one manager and his external structural context. Structuration is occurring in many places at the same time, with managers differently situated throughout the Magma Group. Substantive cases that are complex in terms of the numbers of agents and extensions of time and space will require the research steps outlined in Section 4.10 to be repeated several times. Stones describes this as a ‘composite research strategy’ which involves analysing the structures of a number of different actors over a period of time within a given conjuncture. This is an acknowledgement of the web-like interdependencies between different processes of structuration and recognises that one agent can be first and third person depending on whom the lens of structuration is focused on at any one time. This composite strategy is particularly suited to investigations which seek to explore a particular phenomenon over a given time period (Stones, 2005, p. 126). This essentially involves analysing the case data several times, each time using a different agent-in-focus, in other words, each time using a different manager as the lens of analysis.

It would have been beyond the scope of this study to regard all managers interviewed as agents-in-focus. When all interview transcripts were analysed in Phase 1 of data analysis, as described in Section 4.8, and Stones' composite research strategy was decided upon as the most appropriate means by which to develop further insights into the case data, criteria were established with which to refine the list of managers interviewed in Figure 4.4 into a manageable number of agents-in-focus. These criteria are as follows:

- All managers selected must have relative proximity to the NPD process.
- A manager must be selected who regularly works on NPD Teams.
- A manager must be selected who sits on the Steering Committee.
- A manager must be selected from the Finance function.
- Comparable managers in Topwood and Metbuild must be selected so as to facilitate comparative analysis.

To this end, six managers were selected as agents-in-focus. Stones' composite research strategy is applied to each in turn and the results of each analysis are presented in Chapter Six. These managers, listed in Table 4.3 below, are identifiable in the case study map in Figure 4.4. The relevant background of each is provided at the beginning of each manager's individual structuration analysis in Chapter Six and the corresponding section is included in the table below.

Table 4.3: List of Agents-in-Focus

Name	Job title	Company	Section in Chapter Six
Jack	Head of Operations	Topwood	6.3
Paul	Head of Finance	Topwood	6.4
Nick	Managing Director	Topwood	6.5
Pete	Head of Operations	Metbuild	6.6
Des	Head of Finance	Metbuild	6.7
John	Managing Director	Metbuild	6.8

It is important to note that in a given analysis, the other five agents-in-focus become agents-in context. Agents-in-context are agents within the community of practice on whom the analysis is not focused but they inform the behaviour of agents in the same way as any other external structure (Stones, 2005, p. 93). The relevant agents-in-context in this study are not limited to the other five agents-in-focus but include networked others throughout the group, many of whom were interviewed during the data gathering process as illustrated in Figure 4.4.

4.10.2 Performing Stones' composite research strategy

The analysis of Jack was performed first. All of the interview transcripts, notes and documentation were first reviewed in order to identify Jack's dispositional frame of meaning. Any data pertaining to Jack's dispositional frame of meaning were coded using coloured highlighter pens to identify it. This review was not limited to Jack's interview transcript and notes; all thirteen interview transcripts, corresponding notes and documentation were reviewed for evidence of Jack's dispositional frame of meaning. Often the responses of the other interviewees, and not necessarily of the other agents-in-focus, provided insights into Jack's dispositional frame or perhaps corroborated aspects of his dispositional frame that emerged from the analysis of his own interview (Refer to Step 1 in Section 4.10).

The same interview transcripts, notes and documentation were reviewed again in order to identify Jack's conjuncturally specific internal structures. The relevant data were coded using a different coloured highlighter pen to identify it (Refer to Step 2 in Section 4.10).

Finally, the interview transcripts, notes and documentation were reviewed in order to identify Jack's external structures. The relevant data were coded using a third coloured highlighter pen (Refer to Step 3 in Section 4.10). The identified external structures were reviewed for possibilities for action and structural modification and the resulting observations were recorded on the coded transcripts, notes and documentation (Refer to Step 4 in Section 4.10). These four steps were repeated for the remaining five agents-in-focus.

A grid-like framework was established which was designed to capture the results in a logical and meaningful fashion. Each agent-in-focus headed up a column on the grid. Dispositional frames of meaning headed up a row. Conjunctionally specific internal structures headed up a second row and external structures and associated possibilities for action and structural modification headed up a third row. Each coded section of the transcripts, notes and documentation was placed in its appropriate part of the framework. Each part of the framework was reviewed in detail and analytical notes were added. Once fully collated, this framework presented an initial draft of the qualitative results presented in Chapter Six. A significant amount of time was spent by the researcher in mastering this method of data analysis and, as with Phase 1, the actual collation of the framework underwent several iterations before the draft results were presentable in a clear way.

The completed framework was carefully reviewed for substantive and critical insights, comparisons and contradictions and recurring or isolated themes. This lengthy period of analysis formed the basis for the findings presented in Chapter Six.

4.10.3 Evaluation and rejection of computer-assisted techniques of analysis

The use of software to assist in qualitative data analysis is becoming increasingly common (Richards, 2005). Amongst its most significant benefits is the support it provides to the, often laborious and time-consuming, tasks associated with manual data analysis such as coding transcripts, dividing them up and grouping them (Coffey and Atkinson, 1996; Fielding, 2002). However, it also has drawbacks, including the possibility of disconnecting the researcher from the data, influencing the researcher toward a particular methodological approach and even, to a degree, formalising the analysis into a type of quantitative model (Bazeley, 2007). Added to this is the difficulty of having to learn how to use the software. Having consulted the relevant literature and having made enquiries with individuals with some experience of the software, the researcher decided not to use it. There were two main reasons for this:

- The volume of data gathered was not so significant as to justify spending the time learning how to use the software and preparing the data for analysis.

- The applications of Stones' composite research strategy was an iterative process during which the researcher's knowledge of it and Structuration Theory increased over time. To integrate a piece of software into data analysis at any stage would have complicated the process unnecessarily.

4.11 CONCLUSION

This chapter presented the study's research objective before describing the study's research philosophy, positioning the study in the interpretive section of Hopper and Powell's framework. From this interpretive perspective, Structuration Theory provides the theoretical lens through which the findings are to be examined. The chapter describes the study's research design, together with a discussion of the merits and challenges associated with the chosen research design.

An exploratory interview conducted in the early stages of the study resulted in a refinement of the research objective, led to the selection of Structuration Theory as an appropriate theoretical lens with which to develop the study and confirmed the use of case study as the most suitable means of data collection. The chapter went on to describe how the case data was gathered and how it was analysed in two phases. The next two chapters respectively present the findings from these two phases of data analysis.

Chapter Five

New Product Development in Magma Manufacturing Division

5.1 INTRODUCTION

The purpose of this chapter is to present the first stage of the study's findings and, in doing so, to provide an overview of the study's organisational context and of the organisation's NPD environment.

Section 5.2 describes the organisational context, beginning with the Magma Group and manufacturing division, Magma Manufacturing Division (MMD), before going on to present a detailed account of each of the two manufacturing plants within MMD - Topwood and Metbuild.

Section 5.3 presents an overview of the current status of NPD within MMD before describing, in Section 5.4, the formulation of MMD's first formally documented stage-gate NPD process. Section 5.4.1 explores this process in practice, examining each stage of the process of developing *BuildSafe*, Topwood's most significant new product in recent years.

Section 5.5 describes the evolution of this first formal stage-gate NPD process into the current lengthier process. The key differences between the two processes are explored before going on, in Section 5.5.1, to examine this revised process in practice in the development of *EBuild*, Metbuild's largest ongoing NPD project. Sections 5.4 and 5.5, respectively, provide important insights into how accounting information was implicated in the initial development of MMD's NPD process, and the role it had in the subsequently revised process. Section 5.6 examines projects which have not progressed at stage-gate review, exploring the reasons behind their non-progression.

The study then focuses specifically on individual perceptions of the role of accounting information in NPD. In several instances, these individual perceptions conflict with the formally documented process. This suggests that accounting information, while clearly playing a role in the formal NPD process, also forms a large part of the informal NPD routines and procedures described by managers. This is examined in Section 5.7 and discussed further in Chapters Six and Seven.

Section 5.8 concludes the chapter.

5.2 ORGANISATIONAL CONTEXT

The following contextual details were obtained from discussions with senior management in combination with a review of relevant financial reports, strategic plans and other internal company documentation.

5.2.1 Magma Group

The Magma Group is an Irish-owned commercial organisation operating in natural resources, land-based businesses, renewable energy and manufacturing. The Group employs approximately 1,200 people and describes its core purpose as the innovative and sustainable management of natural resources. In recent years, there has been a growing demand for sustainable building and energy solutions and an increased focus on carbon emitters. Major world economies are now focusing on developing the ‘green economy’ to drive market recovery. In the US, €15bn per annum is being spent on alternative fuels, and the UK government is currently seeking to ensure that all homes built in the UK from 2016 are ‘zero carbon’¹³. To this end, Magma’s core businesses are focused on developing construction materials to make buildings more energy efficient, generating heat and electricity from biomass¹⁴ and wind as well as carbon emission offsetting services. Financial information pertaining to the Magma Group is included in Appendices K, L and M.

The Magma Group consists of three primary divisions: Magma Natural Resources, Magma Enterprise and Magma Manufacturing Division (MMD). The main business of Magma Natural Resources is managing its ready supply of raw material for use in several manufacturing industries. Magma Enterprise comprises two primary businesses: Land Added Value, which focuses on property sales and development and mast sites; and Energy, which is responsible for the development of wind energy sites

¹³ Magma Internal Information Memorandum

¹⁴ Biomass is a general term for material derived from plants or manure. Biomass energy is generated from the combustion of these materials. The type of biomass required is determined by the energy conversion process and the form in which the energy is required. Woodchip biomass is particularly suited to the generation of electrical and heat energy (Demirbas, 2008).

and biomass resources. The primary focus of the study is on the Group's manufacturing division: MMD.

5.2.2 Magma Manufacturing Division (MMD)

MMD is the manufacturing division of the Magma Group. It consists of two companies located at separate plants - Topwood Europe Limited and Metbuild Europe Limited. The Magma Group's organisational structure is set out in Appendix A.

The Group has diversified into manufacturing during the past decade. The first significant investment was a joint venture investment in Topwood in the mid-1990s culminating in its full acquisition in 2002. Expansion continued in 2006 with the acquisition of Metbuild for €67.8m. This acquisition allowed Magma to consolidate further their position in their relevant market and, in conjunction with Topwood, provided a platform for growth. The key financial and operating information for each company is presented in Table 5.1.

Table 5.1: MMD financial and operating information

	Topwood	Metbuild
Turnover (2010) €'000	38,392	64,601
Of which % exports	92%	86%
Earnings before interest, tax, depreciation and amortisation (2010) €'000	(6,187)	(2,635)
Value of net assets	€(432)	€67,605
Annual processing capacity	330,000m ³	440,000m ³
No. of employees	160	153

As indicated in Table 5.1, both companies are making losses. This illustrates the extent to which Topwood and Metbuild are operating in difficult markets with the result that innovation and NPD has become increasingly important for the financial sustainability of both companies.

Using raw material from Magma Natural Resource, Topwood manufactures Alpha¹⁵ products and Metbuild manufactures Beta¹⁵ products. Between the two companies, MMD export almost 90% of the production, primarily to the UK, and the division maintains sales and marketing teams in the UK, Ireland and Holland to service its core markets. Examples of Topwood and Metbuild's products in use are presented in Appendix N.

Alpha is a commodity product more suited to wall sheathing, roofing, flooring, hoarding, packaging, wall partitioning, DIY and general building applications. Beta is a more specialised product than Alpha and is suitable for furniture, shop fittings, mouldings, wall and ceiling panels, shop fronts, external signs and flooring substrates. Alpha and Beta products are complementary in that they share a distribution network, selling through common wholesalers and DIY stores such as B&Q. Ultimately, however, they sell to different consumer markets.

The European markets in which Topwood and Metbuild operate are dominated by several large multi-national players - Kronospan, Sonae, Swiss Krono, Egger, Pfliederer, Finsa and Norbord - most of which manufacture a variety of products, including Alpha and Beta. These commercial rivals enjoy a significant competitive advantage over MMD, due principally to economies of scale and the capability to leverage process or product innovation. However, MMD does have a number of distinct competitive advantages over the rest of the industry. These include: a secure raw material supply through Magma Natural Resources, which is a key limiting factor in other plants throughout Europe; a degree of product differentiation with well established brands in Topwood and Metbuild, both of which have further opportunities for growth; a diversified customer base and strong customer relationships; and a large-scale modern production facility in Metbuild.

Appendix O provides a detailed review of MMD's financial performance in recent years. Profitability maximised in 2008 with the combined effects of the acquisition of Metbuild and the unprecedented demand for both Topwood's and Metbuild's products during the construction boom in Ireland and the UK. The decline in the construction

¹⁵ Topwood and Metbuild's key product types have been named Alpha and Beta respectively in an effort to protect each company's anonymity

industry affected MMD's performance in 2009 and 2010. Decreasing sales volumes, declining market prices and significant movements in the sterling exchange rate had an adverse impact on sales prices, driving down turnover and, in turn, profits. This is despite the implementation of a range of cost cutting measures across both companies, including flexing payroll costs to match supply with demand by reducing headcount, tightly controlling overtime, eliminating contract labour and introducing a rolling programme of temporary shutdowns.

Despite the impact of the global recession, the degree of raw material security enjoyed by MMD as part of the Magma Group is a significant competitive advantage and strongly underpins the economic value of Topwood and Metbuild. However, commodity grade Alpha and Beta products are entering the mature phase of their product lifecycles. The industry is looking to the next generation of Alpha and Beta, calling for higher quality products with tighter environmental specifications (Panels and Furniture Asia, 2010). Demand for higher grade and more innovative Alpha and Beta products is projected to increase significantly over the longer term. For Alpha, the market share growth of timber frame within the European house construction sector is forecast to be of particular significance as a driver of growth. In addition, particleboard and plywood are likely to lose market share to the next generation of Alpha and Beta products over the coming decade due to performance disadvantages (particleboard) or environmental concerns (plywood). Metbuild are well positioned to capitalise on these growth markets in the coming years while Topwood face significant challenges. Each plant will be examined in turn in the subsequent sections.

5.2.3 Topwood

5.2.3.1 Topwood products and markets

Topwood manufactures a range of Alpha products. These are environmentally sustainable products used in structural and non-structural building applications. Topwood currently manufactures three types of Alpha. *Alpha 2* is a general purpose product. It is versatile, strong and cost effective and is recommended for general non-structural building purposes and for structural applications in dry conditions. *Alpha 3* is a strong, versatile product suitable for structural use in humid conditions, and is the

fully certified alternative to softwood plywood. In keeping with current construction methods which aim to build healthier homes, all Topwood *Alpha 3* products have been manufactured using zero added formaldehyde¹⁶.

In 2008, Topwood invested in a coating line at a cost of €0.5m, which led, in January 2009, to the launch of *Topwood Buildsafe*, a coated site hoarding product designed for use in a wide range of applications, from temporary site hoarding to a range of security installations. It is essentially an *Alpha 3* product which is coated with a smooth heavy duty exterior cross linked polymer surface treatment, making it ideal for painting and promoting corporate colours.

Using these different types of Alpha, Topwood manufacture a range of products as set out in Table 5.2.

Alpha 2 and *Alpha 3* would be considered commodity grade Alpha. These products have a wide application but are not distinguishable from the Alpha products offered by Topwood's competitors, such as Kronoply GmbH and Norbord. Overall, Topwood holds in excess of a 50% market share of this grade of Alpha products in Ireland and the UK. Sales projections in these markets are strong for the coming three to five years but, beyond that, the market is expected to move on, looking for higher quality Alpha products with the flexibility to meet tighter specification requirements, e.g. *Topwood Buildsafe*.

Further technological developments in Alpha manufacture are expected to result in new Alpha products being considered a realistic alternative to Omega¹⁷. Omega is currently trading at a significant premium to Alpha and, in the long run, Omega substitution opportunities are likely to sustain volume increases in what is predicted to be a difficult demand environment. Topwood's plant in its current form is not well

¹⁶ Formaldehyde is a chemical widely used in the construction industry to manufacture building materials and numerous household products. It is also a by-product of combustion and certain other natural processes. In homes, the most significant sources of formaldehyde are pressed products (such as Alpha and Beta) which have traditionally been manufactured using adhesives that contain formaldehyde resins. Topwood Alpha 3 products are manufactured using zero formaldehyde (Topwood website).

¹⁷ Alpha's principal competitor product has been renamed Omega in an effort to protect Topwood's anonymity

positioned to meet these NPD challenges. This is examined in more detail in the next section.

Table 5.2: Topwood products

Product	Description
Topwood Product A	Suitable for use as a structural wall sheathing in traditional frame construction.
Topwood Product B	Strong and versatile product designed for use in flooring applications. It is available with a weather-resistant peel-off film for protection against moisture and dirt during building. This Alpha product is load-bearing and manufactured using an exterior-grade glue, making it suitable for structural use in humid environments including kitchens and bathrooms.
Topwood Product C	Designed for use as part of a recognised flat roof system including load-bearing decks and pitched roofs and it is the perfect solution for building dormer windows. Topwood Roof is an engineered product made with an exterior-grade glue and compressed under high temperature. The result is a load-bearing product suitable for structural use in humid environments, with a reliable distribution of strength, stiffness and spanning capacity.
Topwood Product D	Strong and versatile product, ideal for use in Site hoarding applications. Topwood Alpha comprises a range of products developed specifically for use as a secure barrier for construction and temporary works to help prevent unauthorised access. Topwood Alpha 2 and Alpha 3 products have superior strength and stiffness to provide a long-lasting and robust barrier to the enclosure.

(Topwood Sales Brochures)

5.2.3.2 The Topwood story

Topwood was originally incorporated in 1993 as *Louisville Atlantic Magma Ireland Ltd* (LAMI), a joint venture concern of Magma and Louisville Atlantic Corporation (LAC). LAC was a US company with a turnover of €1.4bn. The venture allowed Magma to gain an understanding of their markets and gave LAC access to Magma’s secure supply of raw material. The new plant was specifically constructed to service the US market and was located adjacent to a port so that Alpha output could be immediately shipped to the US. Under the terms of the joint venture, Magma owned 35% of LAMI, while LAC owned 65%.

The plant, which had a capacity to manufacture 330,000m³ of Alpha per annum, was built on an older processing technology referred to as an ‘open and shut press’, which severely restricts production flexibility in terms of manufacturing output. In addition, because the plant was constructed to service the US market, the press was set to make imperial size boards only.

In 2002, Magma acquired LAC's 65% share of LACI for €11.1m, LAC having decided to refocus their efforts on their US manufacturing facilities. LACI, now under the sole ownership of Magma, became known as Topwood Europe Ltd and continued to service the US market.

Severe hurricanes in the Southern states of the US in 2003 wiped out several Omega and Alpha manufacturing plants, thereby increasing demand from the US market for Topwood's product. This, combined with increased demand from the US army for Omega and Alpha to construct army bases at the start of the gulf war, drove Alpha prices to an all time high of \$400 per batch.

Throughout 2004, competing US facilities re-opened and, with US army requirements now met, demand began to return to normal levels. Alpha prices plummeted to \$115 per batch and shipping costs rose due to competing demand for shipping from the emerging Chinese market.

Finally, the weakening of the US dollar from €1.20 to €1.50 rendered the US market unsustainable for Topwood, who had to withdraw and enter the European, UK and Irish markets.

These markets deal with metric size boards only. In order to service this market, therefore, Topwood must cut their imperial size boards to metric sizes, which generates a high level of waste. This means that Topwood faces significantly higher manufacturing costs per unit than their European competitors.

Topwood's inability to produce metric sizes prevents them from developing significant new markets in key European countries, and the 'open and shut press' prevents them from switching a proportion of their product from Ireland/UK to other locations when market circumstances dictate. This limitation is fully exposed when the European market is targeted by North American producers as they compete with Topwood in offering only imperial dimensions and straight edged offerings.

Topwood's, and MMD's, biggest competitive weakness is Topwood's relatively poor plant quality. The plant, valued at €10m, is comparatively antiquated having had little

or no capital investment since its construction in the early 1990s. Topwood management have spent several years requesting that Magma invest in ‘continuous press’ technology similar to Metbuild, which is much more flexible in producing different products and sizes. This technology would decrease the unit costs of production, as there would be a significant reduction in wastage and the plant would have a better overhead recovery with its increased capacity. Moreover, it would facilitate a move away from Topwood’s existing, largely commodity, product offering and allow them to focus on developing new products and new markets.

5.2.3.3 Topwood’s financial performance

Topwood benefited enormously from the building boom, with demand for Alpha exceeding supply during the period from 2006 – 2008. This was in spite of the fact that they faced, and still face, comparatively higher unit costs than their competitors, due to the high levels of waste experienced in having to cut their imperial sized boards to metric sizes in order to service the European markets. Sales volumes decreased when the construction industry declined in 2008. In response, rigorous measures were taken to cut costs in Topwood’s plant but these savings were more than off-set by the adverse effects of the weakening sterling rate against the euro, a factor which had a serious impact on Topwood because of their heavy reliance on the UK market (refer to Appendix O for further data on Topwood’s financial performance during the period 2006-10).

5.2.4 Metbuild

5.2.4.1 Metbuild products and markets

Metbuild currently holds a 22% market share for Beta in the Irish and UK markets. They have developed a diversified product portfolio which provides an element of protection from the commodity nature of the standard product offering.

Metbuild has been a key player in the European Beta market since 1983 and has been consistently committed to R&D, having established itself as a leading innovator with over seven different families of Beta products (as set out in Table 5.3) and many

variants; there are over 400 possible specifications. Ongoing R&D investment has led to market leading developments at Metbuild, specifically, the launch of a new product range of thicker Beta products. In 2007, €17m was invested in Metbuild's plant including two new EVO 56 Defibrator systems, which represent the latest technology in fibre preparation, as well as a ClassiCleaner TM System developed specifically for processing raw materials. These provide a superior screening result which is accurate and consistent.

Table 5.3: Metbuild products

Metbuild Products	Description
Metbuild Product A	Moisture-resistant Beta product designed for use in humid conditions. Ideal for kitchen and bathroom furniture, window and skirting and architectural mouldings.
Metbuild Product B	May be used for a wide range of external applications, including external signs, shop fronts and external woodwork including fascias, exterior mouldings, door parts, garden furniture components, exterior display stands, marine craft interiors and sports score boards.
Metbuild Product C	Flame-retardant Beta for specific use in situations where a flame-retardant product is required under building regulations. This product is suitable for use as: wall linings, partitions, display, ceilings etc. Typical installations are: hotel foyers, offices, public libraries, schools, courthouses, hospitals, cinemas, discotheques and some shipbuilding applications.
Metbuild Product D	Produced using superior technology and specially designed resins. Excellent face properties make it suitable for the thinnest laminates and surface coatings. End users enjoy consistency of quality and thickness as well as reduced tool wear. Its weight advantages open up new design possibilities in many applications such as contemporary furniture, reproduction furniture, children's toys, snooker tables, shop fittings, hi-fi speakers, cabinets and doors.
Metbuild Product E	Specially engineered product with an extra-smooth surface finish. Gives superior results with both traditional finishes and sophisticated powder-coating processes. Its consistent high quality and fine machining properties offer wide design freedom.
Metbuild Product F	Beta product with zero formaldehyde, developed specifically for use in environmentally-sensitive interior applications where formaldehyde emissions need to be kept to a minimum. Ideal for cabinets, display cases, furniture, fixtures, fittings and mouldings in environmentally-sensitive areas such as museums, laboratories, art galleries, nursing homes, schools and nurseries.
Metbuild Product G	Beta product developed specifically with a higher density and improved moisture-resistance, making it ideal for use in laminate flooring applications.

(Metbuild Sales Brochures)

In June of 2009, Metbuild signed a joint development agreement with a UK company, *Ucon*, through which both companies will work toward developing *Ebuild*, an economically viable and non toxic Beta product which is protected from rot and improves stability and durability. *Ucon* is an environmental science company which has developed a range of transformational technologies based upon the acetylation¹⁸. *Ucon* and Metbuild are joining forces to develop a Beta product made from acetylated fibres. *Ucon's* expertise in acetylation and Metbuild's expertise in Beta manufacture will together lead to the development of a product that has the flexibility and usability of standard Beta combined with the resistance to water absorption and increased stability of an acetylated product. This combination of features widens the scope for application of *Ebuild* beyond conventional Beta, specifically in terms of outdoor applications. This will result in significant new market development, allowing Metbuild to develop a product which could challenge sectors currently dominated by alternatives. Under the agreement, Metbuild and *Ucon* will form a joint venture company. Metbuild is granted an exclusive license to develop, manufacture, market, distribute and sell *Ebuild* within the UK and Ireland. Metbuild will generate revenue from these sales based on which they will pay a royalty to the joint venture company. This royalty income will then be split evenly between *Ucon* and Metbuild.

Ultimately, *Ucon's* chemical technology will be incorporated into Metbuild's Beta manufacturing process, the combination of which is considered to be a significant innovation in the industry (Wood Based Panels International, 2010). A successful industrial trial run was completed at Metbuild's facility in 2010. Further development work is ongoing between both companies.

¹⁸ Acetylation is a process that increases the amount of 'acetyl' molecules in material thereby changing its physical properties. The process protects the material from rot by making it 'inedible' to most micro-organisms and insects, without making it toxic. It reduces the material's tendency to swell and shrink making it less prone to cracking and ensuring that when painted it requires less maintenance (Rowell, 2010).

5.2.4.2 *The Metbuild story*

Beta was first manufactured in the US in 1974 by the *Metco* Corporation in Medford, Oregon. *Metco* had a pioneering plant with new technology and a growing market base.

Greg, MMD's current Marketing and Business Development Manager, was then a junior employee working in the London office of a Canadian exporting company which shipped products throughout North America and between North America and Europe. Greg was critically involved in the development of the initial export market for Beta in Europe, to be supplied from *Metco* in Oregon. This market grew to the point that, by 1980, demand for Beta could not be met by US supply. At that time, the Irish Industrial Development Authority (IDA) was searching for inward investment opportunities to bring industry and manufacturing capacity to Ireland, thereby reducing the country's dependency on agriculture. The IDA also wanted to utilise the pine and spruce forest thinnings that were available throughout Ireland following extensive planting programmes in the 1960s, 1970s and 1980s. With some support from the IDA, *Metco* agreed to build a Beta plant in Ireland to service the European market. On 23rd September 1983, the first board of Beta was manufactured in the new Irish Metbuild plant. The original capacity of the plant was 140,000m³ of industrial Beta per annum. The objective at this point was to learn the skills of making Beta to master the standard product offering.

In 1984, Dallas-based company *Vera* acquired the *Metco* Corporation (including Metbuild, its new Irish operation). In 1986, Greg left the exporting company he worked for, joined Metbuild, and set up their Sales and Marketing office in the UK. Similar offices for Metbuild were established in the Netherlands for continental European sales activity. It was at this time that Metbuild's current MD, John, joined the company.

Metbuild's first expansion was carried out in 1994 during which capacity was increased to 300,000m³ per annum. As the European Beta market grew, so too did the number of competitor Beta producers. Metbuild differentiated itself from these

producers with an ‘added-value business and specialty model’, which was linked to strongly marketed ‘quality’ focused branding. The manufacturing facility was therefore adapted to produce thin boards: Metbuild Product A, Metbuild Product B and Metbuild Product C (refer to list of Metbuild products at Table 5.3).

In 1997, *Willo* Industries, based in Portland Oregon, acquired Metbuild Europe from *Vera*. In 2002, a second production line and an upgrade of the existing production line increased manufacturing capacity to 420,000m³, facilitating the development of Metbuild Product D, Metbuild Product E and Metbuild Product F products. In 2002, Washington-based *Wyndham* Corporation acquired *Willo* Industries, including Metbuild Europe, in a hostile takeover.

In 2006, *Wyndham* decided to exit the Beta market and disposed of seven plants in the US and four plants in Europe, including Metbuild. The Magma Group acquired Metbuild Europe for €67.8m and established Magma Manufacturing Division alongside Magma Natural Resources and Magma Enterprise divisions. This acquisition was funded by a group refinancing that was completed in November 2006.

Since Magma acquired ownership of Metbuild, it has continued to invest in its production facilities. In 2008, Magma invested €17m in new technology and equipment to improve production facilities and refiner capabilities at its plant. Metbuild now has a very modern plant with two continuous press lines and annual capacity of 440,000m³. Previously, the maximum thickness of boards produced and available to the market was 30mm. This investment has enabled certified Beta products to be made thicker than ever before. Metbuild Product D is now available in 32mm, 36mm, 38mm, 40mm, 42mm and 45mm. It is used in furniture components, mouldings manufacture, interior design, shop fitting and many other applications. The wider choice of thickness offers greater design freedom than was previously possible.

Over the next three years, Magma is planning on investing €5m in a Combined Heat and Power (CHP) plant in Metbuild and a further €5m in resin technology. These investments have potential paybacks of three years and will help to significantly reduce the operating costs of the plant.

5.2.4.3 Metbuild financial performance

Metbuild has also been affected by the downturn in the construction industry although they were less vulnerable than Topwood due to the higher levels of product differentiation in the Metbuild brand. Metbuild implemented similar cost-cutting measures to Topwood and experienced the same adverse impact of the weakening of the sterling against the euro (refer to Appendix O for further data on Metbuild's financial performance during the period 2006-10).

5.2.5 Magma's strategic outlook

In 2006, the Magma Group appointed a new Chief Executive, Bill. At the outset of his tenure, Bill highlighted the Group's heretofore over-reliance on the commodity-based construction industry and the need, in the future, to move Magma's products up the value chain:

We're now about getting higher value products with higher margins through the line. We had to abandon this 'produce at all costs' mentality because it doesn't make sense. This meant we had to start taking down-time and stop feeding commodity products into a market place that doesn't need them and which make no money for Magma. We needed to focus on developing new products... So that required a change of philosophy and a change of attitude (*Bill, Chief Executive of Magma*).

Bill brought about a cultural change in Magma, and particularly in MMD, which led to less emphasis being placed on high-volume commodity manufacturing and a greater focus on value-added products, which travel further and ultimately generate more profit:

The product people- their sin is that they are production oriented. It doesn't matter what they are making as long as the factory is moving. And the challenge to them is to understand that that is not the priority. The priority is to make money on what the factory is producing and to choose what goes through the factory in terms of what makes the most amount of margin for the time the factory is running (*Bill, Chief Executive of Magma*).

Bill also recognised an increasing focus on climate change, leading to a growing demand for sustainable building solutions. In response, the Group set out to capitalise commercially on the growth in sustainable procurement policies being implemented

by governments and corporations throughout the world¹⁹. This culture is reflected in the managers' interview responses:

Ultimately the customer drives the environmental changes but by and large we're looking for profitable products. For example CARB 2 compliance is progressive and environmental and a good thing to do but ultimately it's good business. It differentiates us from our competitors because it allows our customers to export to the US where the market insists on CARB compliance (*Simon, Head of MMD*).

All of Magma's actions and investment decisions are guided by the need to make profits and create value for the Group²⁰. However, Magma's, and particularly MMD's, environmental sustainability differentiates it from its competitors and ultimately contributes to the company's bottom line:

Look we've got a green agenda... we've got to be seen to be doing things but I am pushing for the business case all the time.... Ultimately we're guided by the numbers (*Ian, Magma Group Chief Financial Officer*).

5.2.5.1 Magma's goals, values and key performance indicators

Magma describes its commitment to innovation as an integral part of its business approach²¹ and this is reflected in its goals and values, which are heavily publicised on Magma's website, in its annual report and in its merchandising and promotional materials. These are set out in Table 5.4.

The Group tracks its progress in achieving these goals against a range of key performance indicators (KPIs) on a quarterly basis. These KPIs have targets attached and are reported using a traffic light system, i.e. red if the target is missed significantly, orange if results are close to target and green if results meet the target. These KPIs are listed in Table 5.5.

¹⁹ Magma 2010 Annual Report

²⁰ Magma Internal Document entitled 'Defining Magma's Weighted Average Cost of Capital', 2010

²¹ Magma 2010 Annual Report

Table 5.4: Magma goals and values

Magma Goals	Magma Values
<p><i>Customers</i> To be a business that partners with our customers, understands their needs and provides innovative and sustainable products and services that excite them.</p>	<p><i>Building powerful relationships with our customers, our partners and our people.</i></p>
<p><i>Economic Value</i> To be a business that contributes economic value at every level – a profitable commercial business.</p>	<p><i>Continually driving excellent performance.</i></p>
<p><i>Progressive Business</i> To be a progressive business, recognised for our role in sustaining the earth’s natural resources, attracting people to nature and supporting local communities.</p>	<p><i>Renewing, innovating and growing.</i></p>
<p><i>Vibrant and Competitive Organisation</i> To be a vibrant and competitive organisation that energises our people, and provides sustained performance challenges, personal growth, recognition and pride.</p>	<p><i>Positively contributing to the environment and community.</i> <i>Commercially viable and successful.</i></p>

Table 5.5: Magma KPIs

	Customers
1.	Customers satisfaction index
2.	Revenue from new products and services
3.	Percentage market share
	Economic Value
4.	Profit/Loss
5.	Group operational cash flow
6.	Return on capital employed
7.	Overhead costs %
8.	Margin %
9.	Debt funding measures
	Progressive Business
10.	Certification
11.	Brand health
12.	Sustainability
13.	Stakeholder recognition of the public good benefits
14.	Performance benchmarks
	Organisation
15.	PMED performance distribution
16.	People engagement and involvement indices
17.	Innovation activities
18.	Progress against D2102 programme
19.	Talent management plan
20.	Health and safety management

Magma Group Board Report, July 2010

Two of these KPIs relate specifically to the Group's innovative activities. 'Revenue from new products and services' specifies, both in euro and in percentage terms, the amount of revenue being generated by products and services developed in the previous three years.

In the first half of 2010, the Group performed well in an overall context with revenue from new products and services 6.5% ahead of the 25% target. Magma's Group Finance function are calling for this KPI to be amended to 'Profits from new products and services':

Revenue from new products is well and good, and I understand the importance of creating that culture, but I think now we need to start concentrating a little more on the profit that the new products generate (*Ian, Magma Chief Financial Officer*).

The 'Innovation activities' score is based on the number of NPD projects undertaken, and the number of prototypes developed, in a particular period. The Group has scored red on this KPI because no projects were completed or prototypes developed during the first half of 2010. The Head of MMD reports that Topwood and Metbuild are concentrating on developing a pipeline of ideas that will deliver on this KPI in the coming year.

5.2.5.2 Magma's key strategies

With its goals and values in mind, the Magma Group have identified seven key strategies as documented in the Group's five-year plan to 2012:

1. **Expand our natural resource business** while improving competitiveness and maintaining a strong focus on environmental management and national policy considerations.
2. **Realise greater commercial potential from our land assets** by adopting a more proactive approach to land development.
3. **Strengthen our market position in manufacturing markets** by extracting additional value from our existing business portfolio and by strategic investments to achieve horizontal or vertical integration.
4. **Optimise the value of renewable energy assets** – wind generation and biomass.
5. **Strengthen our business development capability** both to identify and pursue new business opportunities and enable our current businesses to grow further.
6. **Develop innovation capability** with specific focus on new added-value products and process improvement.
7. **Transform the Group** into a high-performance, innovative, commercial and customer-centred organisation.

The third strategy regarding strengthening market position in key markets aims to build on MMD's competitive strengths and address its weaknesses. This will primarily involve devising, resourcing and implementing initiatives to de-commoditise existing products and develop new application-oriented products to meet specific end-user needs. Metbuild's joint product development agreement with *Ucon* looks towards the next generation of Beta products, which will enable products to be developed for new outdoor applications. This will make Beta, for the first time, an exterior product without the need for coating or treatment, thus making it a true competitor with wood products. In contrast, Topwood is currently largely confined to producing commodity grades of Alpha due to the limited capability of its plant. Topwood's existing plant is not a sustainable business model as the asset ages, and it certainly does not fit into Magma's strategic aspirations. Magma must decide whether to invest in the business to enable it to move to a value-added model like Metbuild, or exit the business by closing or selling it. The Board is considering several capital investment options and the scale of the investment necessary is thought to be in the region of €85m.

5.3 NEW PRODUCT DEVELOPMENT IN MMD

Magma’s strategic vision is strongly oriented towards NPD and, specifically in MMD’s case, the de-commoditisation of its existing product offering:

We have changed the business model here [in MMD] from a very commodity-oriented model to a value-added business model, going from what was 10% value-added products to 50% value-added products (*Bill, Chief Executive of Magma*).

This strategy has resulted in increased NPD activity as both companies have sought to expand their product base. Table 5.6 lists MMD’s product launches since 2007.

Table 5.6: MMD new product launches 2007-2010²²

Metbuild
<i>Metbuild New Product 1</i>
<i>Metbuild New Product 2</i>
<i>Metbuild New Product 3</i>
<i>Metbuild New Product 4</i>
Topwood
<i>BuildSafe *</i>
<i>Topwood New Product 1</i>

* *BuildSafe* was a significant NPD project in Topwood and is examined in detail in Section 5.4.1.

MMD have several NPD projects in progress. These are listed in Table 5.7. Both companies are seeking to develop products of higher quality with greater degrees of differentiation from the existing products on the market. These products take longer to develop, with the result that both Topwood and Metbuild now have several ongoing NPD projects at different stages of progression.

²² This list was derived through discussion with Magma’s CFO, Ian, and corroborated through review of internal company documentation as well as Topwood and Metbuild sales material.

Table 5.7: MMD NPD projects in progress

Metbuild	NPD Stage (Per 2nd Generation NPD document)*
<i>Ebuild</i>	<i>Stage 5 Prototype & Testing</i>
<i>Metbuild Project in Progress 1</i>	<i>Stage 2 Early Screening by Steering Committee</i>
<i>Metbuild Project in Progress 2</i>	<i>Stage 5 Prototype & Testing</i>
<i>Metbuild Project in Progress 3</i>	<i>Stage 1 Challenge & Concept Definition</i>
<i>Metbuild Project in Progress 4</i>	<i>Stage 5 Prototype & Testing</i>
<i>Metbuild Project in Progress 5</i>	<i>Stage 2 Early Screening by Steering Committee</i>
Topwood	
<i>Topwood Project in Progress 1</i>	<i>Stage 5 Prototype & Testing</i>
<i>Topwood Project in Progress 2</i>	<i>Stage 5 Prototype & Testing</i>
<i>Topwood Project in Progress 3</i>	<i>Stage 3 Market Analysis</i>
<i>Topwood Project in Progress 4</i>	<i>Stage 5 Prototype & Testing</i>
<i>Topwood Project in Progress 5</i>	<i>Stage 2 Early Screening by Steering Committee</i>
<i>Topwood Project in Progress 6</i>	<i>Stage 3 Market Analysis</i>
<i>Topwood Project in Progress 7</i>	<i>Stage 3 Market Analysis</i>
<i>Topwood Project in Progress 8</i>	<i>Stage 3 Market Analysis</i>

* The NPD Stages are set out in Sections 5.4 and 5.5

Magma Group Board Report, July 2010

EBuild is Metbuild's largest ongoing NPD project and is reviewed in detail in Section 5.5.2.

Before examining MMD's NPD process and the accounting information that forms part of that process, it is necessary to describe how this NPD process has developed since MMD's inception in 2006.

5.4 DEVELOPMENT OF A FORMAL NPD PROCESS

As set out in Section 5.2.2, the MMD division effectively came into existence after Magma's acquisition of Metbuild in 2006. NPD was immediately highlighted as a priority for both companies in the division:

So now we find ourselves having to refocus our energies in a very concentrated way over the next while to get new products onto the market and we've set ourselves some challenges, in that, in 2008 Metbuild will have a new product offering on the market and that equally Topwood will have something (*Des, Head of Finance, Metbuild, May 2007*).

With this new strategic focus on NPD came a requirement by Magma for the development of a formal NPD appraisal process:

One thing that Magma have come down very strong on is the requirement that there is a process to be followed, that you tick all the boxes, that you reach various decision-points in the process which will determine whether you go or stop, and that's something that maybe wouldn't have been as formal here in the past (*Des, Head of Finance, Metbuild, May 2007*).

In late 2006, representatives from Topwood and Metbuild were asked by Magma Group HQ to formulate an NPD process and to present it in the form of an NPD process document, which would be used to track each stage of a project's development. Together, Jack, the Head of Operations at Topwood, Pete, the Head of Operations at Metbuild and Greg, MMD's Marketing and Business Development Director, led the project. The brief was to develop a more rigorous approach to NPD which could be encapsulated in a document:

Previously we had a system here, ok, it was 'back of the stamp stuff', we did all of this stuff but it was in our minds, we didn't write it down but then you're into, how formalised is it, how beaucratic is it? We have an excellent opportunity here. No-one has landed a book on our desk and said 'right, that's the way you do it'. They [Magma] are asking us to develop our own methodology and if it is solid enough they're not going to question it. It is a wonderful opportunity (*Pete, Head of Operations, Topwood, May 2007*).

Over the course of six months, this team developed a document which formalised each phase of MMD's stage-gate NPD process:

[It is] a formal structure where those 'blue sky' things, as well as those predictable things, could be dropped in a funnel, could be captured and then go into a process where you say 'ok, what are the basic protocols - 8 or 9 stages which everything must go through in order to filter out the good, the bad, the ugly...' (*Greg, Marketing and Business Development Director, MMD*).

No representative from Finance was included on this team. Both Des (Head of Finance, Metbuild) and Paul (Head of Finance, Topwood) were consulted on the final draft and made some minor suggestions regarding the inclusion of accounting information, all of which were implemented.

The outcome of this project was a document, hereafter referred to as the *1st Generation NPD Process Document*, which was approved by Magma Group HQ:

We felt we generally had something that looked and felt the same for every project... That's what we needed (*Bill, Chief Executive of Magma*).

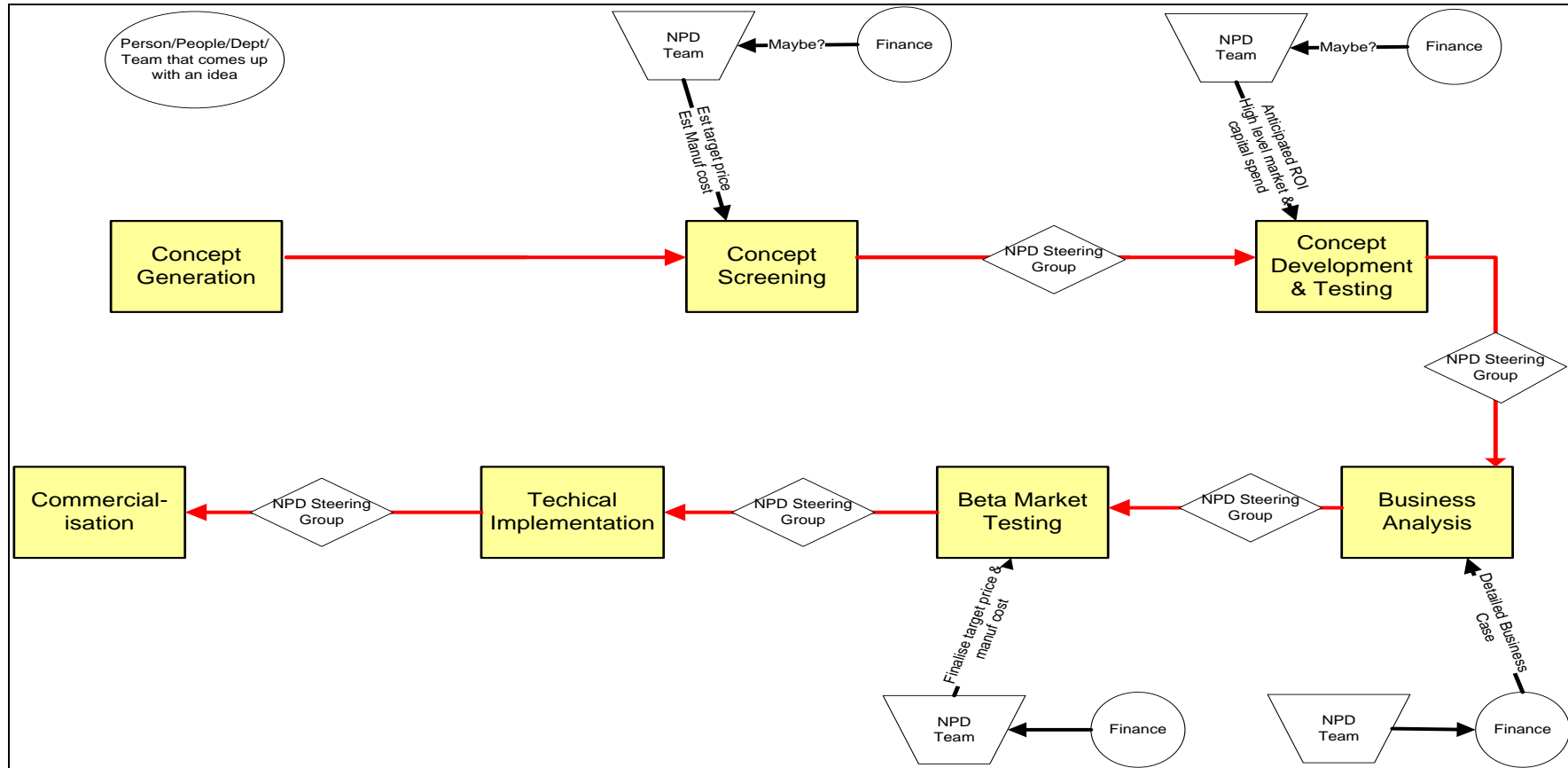
This document contains the pack of information which accompanies the formal NPD process. As the project progresses, more information is accumulated. A blank copy of this document, provided by the case company, is presented in Appendix P. For ease of reference a detailed diagrammatic representation of the process, prepared by the researcher, is presented in Figure 5.1.

As set out in the document at Appendix P, the process comprises seven stages. Stage 1, *Concept Generation*, is designed to document the origins of the idea. All projects which are initiated must progress to Stage 2, *Concept Screening*, after which each stage is separated by a stage-gate at which the Steering Committee decide, based on a presentation of the information in the NPD document together with back-up schedules, whether to proceed to the next stage.

The members of the Steering Committee and the members of the NPD Team in each company are set out in Figure 5.2. The Steering Committee consists of the Magma Group senior management team, assembled from across the divisions. Magma's CEO, Bill, decided to formalise their role into an NPD Steering Committee in order to demonstrate their commitment to NPD and the formal NPD process. The NPD Team consists of anybody that is actually working on the project. Members will change throughout the project's duration. There is no representative from Finance on the Steering Committee, though Simon (Head of MMD) is a chartered accountant by profession. Every month, the Steering Committee reviews each project in turn to decide if it should be moved on to the next stage. Several NPD projects will be in progress at any given time:

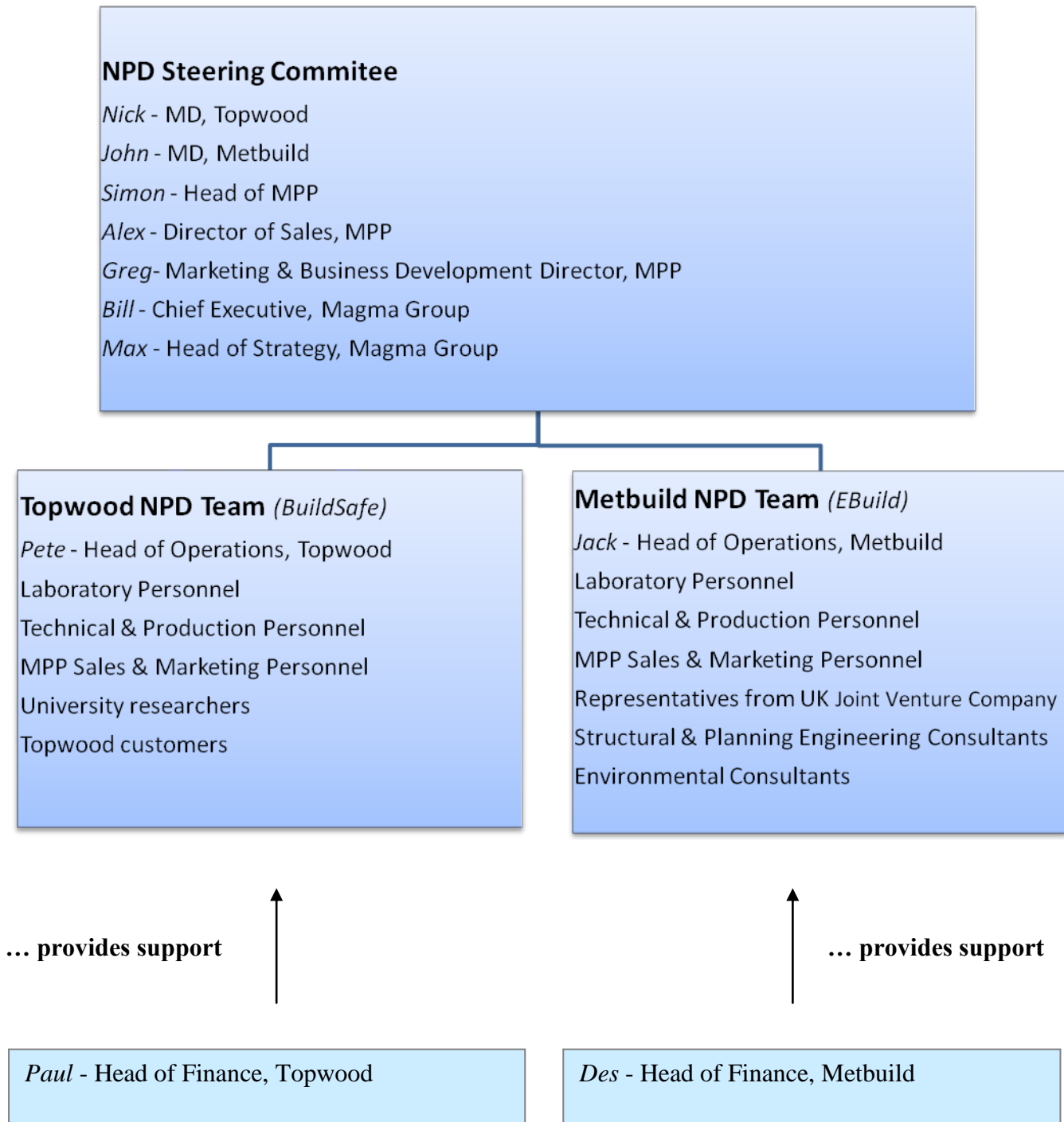
This Group is about prioritising, giving gate approval, giving direction, ensuring resources are in place and making sure we're happy with the breadth and depth of the pipeline (*Simon, Head of MMD*).

Figure 5.1: Graphic Representation of Accounting Information in MMD 1st Generation New Product Development Document



Note: This diagram was prepared by the researcher based on the various stages in the process as set out in the formal document in Appendix P, as well as detailed discussions with several managers regarding the objective of each stage, who is involved in each stage, the information reviewed in each stage, the accounting information reviewed in each stage and how that accounting information becomes integrated into each stage of the process.

Figure 5.2: Members of steering committee & NPD teams



Note: This graphic is prepared by the researcher based on discussions with several managers as described throughout section 5.4. Both Heads of Finance are described as ‘providing support’ because they are on neither the Steering Committee or the NPD Team but they are asked to be involved in NPD at different stages throughout the process, particularly during the ‘Business Analysis’ stage.

The objective of Stage 2, *Concept Screening*, is to decide if a concept is a ‘go or no go’ based on the criteria set out in Table 5.8:

Table 5.8: Criteria in stage 2 ‘Concept Screening’

Defined Concept / Product Specification
Actual consumer / end-user benefit
Target price estimated and realistic
Manufacturing cost estimated and realistic
More profitable than existing products
Manufacturing capability (in-house / external)
Resources required to advance this project have been estimated ie. Capital, Technical, Financial
EHS issues have been considered and present no problems
Strategic fit with CPP plans
Product liability issues are manageable
Clear identifiable Market and Sales potential
Route to market and marketing costs (including IP potential) manageable

Extract from 1st generation NPD Process Document, full copy included in Appendix P

Each factor is reviewed by the Steering Committee and, after discussion with the NPD Team, must be checked with ‘Yes’, ‘No’ or ‘Not sure’. The Steering Committee must reach a consensus on each point. If any factor is checked ‘No’, the project must be stopped. If any factor is checked ‘Not Sure’, the project team must clarify the uncertainty and the stage is repeated. If all factors are checked ‘Yes’, the project continues to stage 3, *Concept Development and Testing*.

During Stage 3, *Concept Development and Testing*, several aspects of the proposed project are scored and weighted in order to develop an absolute rating between 1 and 10, facilitating review and comparison with other projects by the Steering Committee. At Stage 4, *Business Analysis*, the Finance function, with support from the NPD Team, develops a comprehensive business case for the product. If the project proceeds to Stage 5, *Beta and Market Testing*, a prototype of the new product is built and detailed market and customer testing is carried out, after which Stage 2 is repeated in light of the new information obtained in Stages 3, 4 and 5. Stage 6, *Technical Implementation*, is a lengthy stage during which capital plant work is completed and personnel and plant resources are finalised. Stage 7, *Commercialisation*, involves the development and execution of product launch, advertising, promotion plans, distribution and stocking plans.

This formalised process was followed during Topwood's *BuildSafe* development. Section 5.4.1 presents a detailed account of the product's development, with particular focus on the accounting information used as part of that process.

5.4.1 The BuildSafe development

Given the sensitive nature of the documentation, the researcher was not granted permission by Magma to provide a copy of the completed document in this thesis. However, the full set of documentation was made available to the researcher and is described below.

The idea for this product emerged from a competitive weakness in Topwood's existing Alpha site hoarding offering. MMD's sales and marketing team requested that a product be developed to better meet market needs. Research and development was conducted by Topwood's production team and an initial design was prepared for what was considered to be a workable proposed new product offering. To this end, Stage 1, *Concept Generation*, sets out that this product concept is an augmentation of an existing product line. An NPD Team was formed to progress the project, consisting of Topwood laboratory, technical and production personnel, including Topwood's Head of Operations, Jack, representatives from MMD's sales and marketing functions, as well as external representatives from one of the company's affiliated universities and some Topwood customers.

Accounting information features for the first time in the *BuildSafe* process in Stage 2, *Concept Screening*. Target prices are estimated at £18-£20 per board for the UK market, and €16-€18 per board for the Irish market. These prices are estimated by members of the Sales Department as a result of discussions with several customers. This stage of the documentation process also indicates a manufacturing cost of €5 per board, estimated by the Production Team based on initial manufacturing specifications. Based upon these estimates the proposed *BuildSafe* product offers a margin premium over Topwood's current offering in the range *Topwood 3*. Several other aspects of the project are also examined during this stage including manufacturing capability, plant resources, environmental issues and strategic fit.

Topwood’s Head of Operations, Nick, who was a member of the Steering Committee for this project, confirmed that the project was approved at this stage primarily because of the expectation that *BuildSafe* would be more profitable than *Topwood 3*.

During Stage 3, *Concept Development and Testing*, a Return on Investment (ROI) and high level capital and marketing spend is estimated by the NPD Team, who draw on the Finance function for support when necessary. These three pieces of information, together with other aspects of the potential new product, including quality of distribution base, availability of internal technical resources, readiness of existing sales skill set and patent/intellectual property issues, are scored and weighted in order to develop an absolute rating of a figure between 1 and 10 for the project, thereby facilitating review and comparison with other projects by the Steering Committee:

It brings together all of the different dimensions that we have to consider (*Paul, Head of Finance, Topwood*).

Table 5.9 provides a breakdown of *BuildSafe*’s absolute rating.

Table 5.9: Weighting of various elements of *Buildsafe*’s absolute rating

	Weighting	Score (1-10)	Rating
Anticipated ROI	0.3	8	2.4
Distribution Base	0.15	10	1.5
Capital Investment	0.15	5	0.75
Internal Technical Resource	0.12	6	0.72
Existing Skill Set	0.12	8	0.96
Patents/Intellectual Property	0.06	5	0.3
Marketing Investment	0.1	4	0.5
Total	1		7.03

Extract from BuildSafe NPD Document

The largest weighted item in the analysis is the ROI. The ROI is described as ‘*the hurdle rate as projects that can get over this rate will be invested in*’²⁴. In Magma, an acceptable ROI can vary between 5% and 15% depending on the type of project. The rate thresholds for the different divisions are defined in the capital expenditure policy.

²⁴ Magma Internal Document entitled ‘Defining Magma’s Cost of Capital’, 2010

The rate for Magma Manufacturing Division is the Company *Borrowing Rate* + 5%. At the time of the *BuildSafe* development, the company borrowing rate was 3.4% meaning that the ROI threshold was 8.4%. *BuildSafe* had an anticipated ROI of 10.3%, which exceeded the ROI threshold by 23% and so ROI was scored at 8 out of 10. The score was collectively arrived at by Jack (the Head of Operations at Topwood) and Paul (the Head of Finance at Topwood). If the anticipated ROI was below the threshold, it would receive a 'zero' rating which would effectively stop the project.

Capital expenditure is also examined at this stage. Capital spend was anticipated at approximately €700,000. Though a comparatively low capital investment requirement, this was considered high relative to the value of the projected income stream. As a result, this factor was scored, again by Jack and Paul, at 5 out of 10.

There are no specific guidelines governing the scoring for each of the factors. According to Paul, each score is arrived at by the team, or the relevant member of the team, and is influenced by the risk and values associated with each individual project.

BuildSafe received an absolute rating of 7.03 out of 10 and was approved to progress to the next stage. There is no stipulated cut-off point for approval/rejection of a project. All of the factors are examined in detail by the Steering Committee and each project is judged on its own merits.

In Stage 4, *Business Analysis*, the Finance function with support from the rest of the NPD Team develops the comprehensive business case setting out five-year forecasted sales volumes, sales prices, margins, returns and breakevens as well as analyses of planned equipment spend, building and installation costs, production costs, distribution and storage costs and advertising and promotion costs. The accounting information reviewed during this phase is specific and detailed in that it sets out timetables of expenditure, vendor quotes and financing options.

Stage 5, *Beta and Market Testing*, sets out the specifications and detailed results of the production of several sample products. These are manufactured in a laboratory environment and subsequently exposed to test conditions in terms of weather and

hazards before beta testing by customers. This testing stage was successful and *BuildSafe* therefore progressed to the next stage. No accounting information is reviewed during Stage 5.

Stages 6 and 7 set out *BuildSafe's Technical Implementation* and *Commercialisation* checklists respectively, both of which are signed and dated as each item is completed. No accounting information is reviewed during either stage.

BuildSafe was launched to the market in December 2009 and achieved turnover in Topwood of €708,000 in 2010. *BuildSafe's* real value is the potential it offers for product line expansion in the future.

5.5 THE EVOLUTION OF THE NPD PROCESS

After the *BuildSafe* launch, the designers of the original process and John, Metbuild's Managing Director, were asked by MMD to assess its efficacy:

We got together a sub-group... myself, John and Pete from Metbuild.... and we met and surgically dissected this [pointing at *BuildSafe* project documentation]... this [pointing at the business case back-up] was holding things up...God yeah, it is a pain in the neck (*Jack, Head of Operations, Topwood*).

The over-riding conclusion of this assessment was that this process allowed too many projects to progress too far before being rejected on the grounds of marketability. This sentiment was echoed throughout MMD:

... a lot of these things come out of 'production' because somebody thinks they've got a cracking idea because we can make things in circles now and not squares and it looks great. And nobody really used to phone up and say 'well do they want circles instead of squares' (*Alex, Director of Sales, MMD*).

The NPD process was revised, leading to the development of what is hereafter referred to as the *2nd Generation NPD Process Document*. Again, no Finance representative was specifically involved in the redrafting of this document, though Des (*Head of Finance, Metbuild*) and Paul (*Head of Finance, Topwood*) were consulted and agreed to the final draft. A blank copy, as provided by the company, is

presented in Appendix Q. Again, for ease of reference, a detailed diagrammatic representation, prepared by the researcher, is presented in Figure 5.3.

The 2nd Generation NPD process is longer than its predecessor and consists of ten stages, of which the *Business Analysis* stage is eighth. The first two stages are similar to those in the original process. Stage 1, *Challenge and Concept Definition*, documents the origins of the idea, and, specifically, what the company hopes to achieve in strategic, customer, market and cost-base terms. Stage 2, *Early Screening*, is narrower in scope than Stage 2 in the previous process, challenging the concept under the headings set out in Table 5.10:

Table 5.10: Criteria in stage 2 ‘Early Screening’

Defined concept / Product specification/ Project scope
Clear identifiable market and sales potential
Market value proposition
High level quantitative assessment
Strategic fit with MMD plans
Assign sales and marketing resources for further analysis

Extract from 2nd generation NPD Process Document, full copy included in Appendix Q

Estimated target price, estimated manufacturing cost and estimated capital, technical and financial resources, which were previously examined in Stage 2, are now pushed downstream in the process. Like in the previous Stage 2, each factor is reviewed by the Steering Committee and, after discussion with the NPD Team, must be checked with ‘Yes’, ‘No’ or ‘Not sure’. The Steering Committee must reach a consensus on each point. If any factor is checked ‘No’, the project must be stopped. If any factor is checked ‘Not sure’, the project team must clarify the uncertainty and the stage is repeated. If all factors are checked ‘Yes’, the project continues to Stage 3.

A key development in the updated process is the inclusion of Stage 3, *Market Analysis*. This presents a more detailed evaluation of the consumer marketability of the product, which was briefly reviewed in Stage 2 of the previous process:

A big chunk of work has to go around market assessment and whether or not we believe that there is an appetite for this product in the marketplace... that’s absolutely critical (*Simon, Head of MMD*).

This evaluation of the market is conducted earlier than previously, in an effort to reduce the time spent on projects which ultimately do not proceed to launch:

We did the market analysis badly. Now we do that earlier and better (*John, Managing Director, Metbuild*).

This suggests that sales and marketing information is considered more critical to decision making than any other type of information at the early stages of the NPD process. If a proposed product does not demonstrate adequate sales potential at the outset, the project will not progress. This is the crucial change in the revised process; marketing information is relied upon to perform an earlier screening of proposed projects:

If you talk to Sales & Marketing, they would say that Technical don't respond quick enough. And if you ask Finance they will say, well, Marketing come along with these wooly ideas, they don't know exactly what they're doing, so you have a little bit of finger pointing going on but the whole idea here is to have a process that only kicks in resources when they're absolutely required and first of all we need to know the market. So that's one of the reasons why we changed it from there (1st generation NPD document) to there (2nd Generation NPD document). We brought marketing up higher (*Nick, Managing Director, Topwood*).

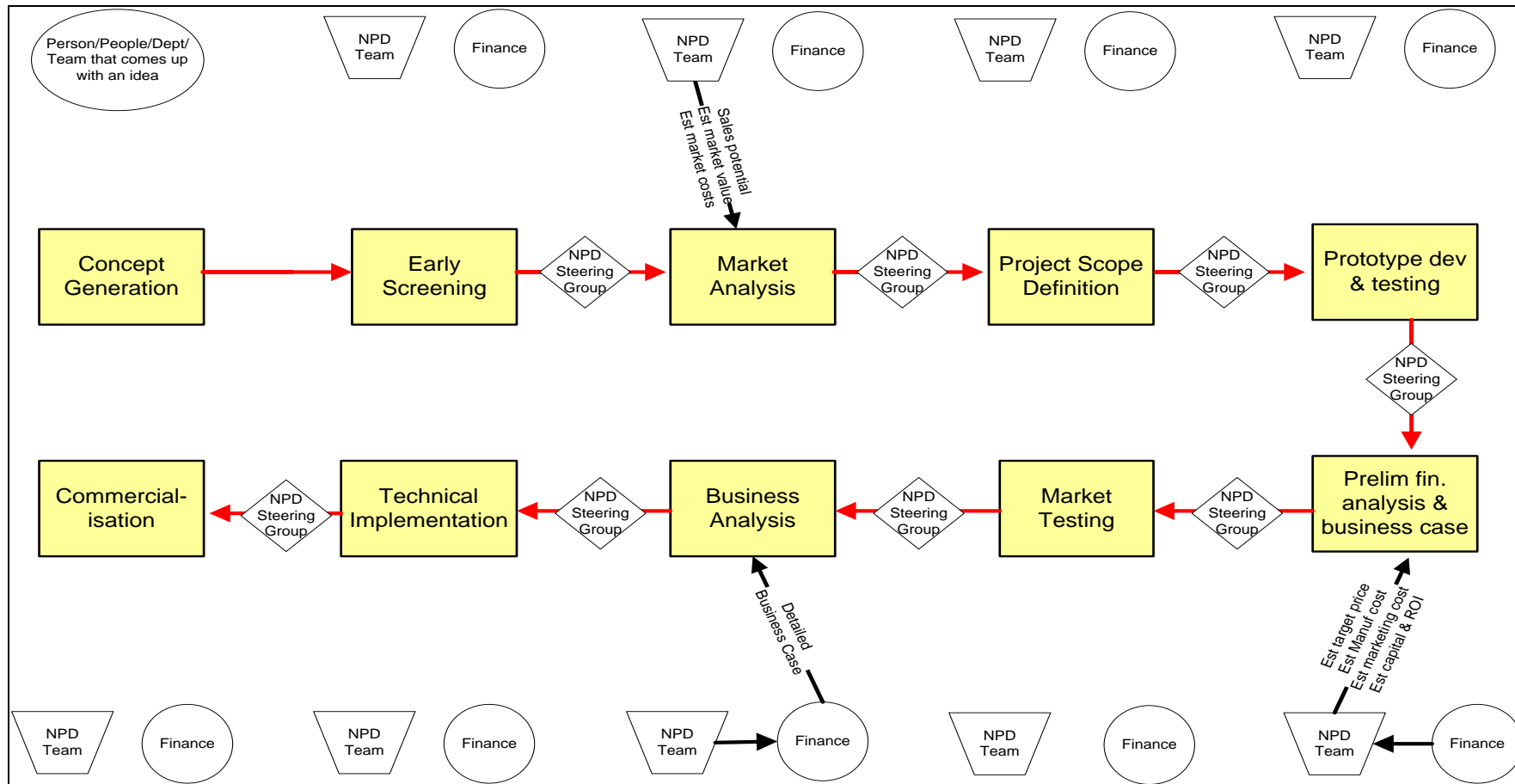
Stage 4, *Project Scope Definition* defines the project scope based on the criteria set out in Table 5.11:

Table 5.11: Criteria in stage 4 'Project Scope Definition'

Key insights defined and discussed with shareholders
Input received from:
sales and marketing
customer base
manufacturing and technical resource
Manufacturing capability (in-house/external)
Environmental issues
Project scope defined
Project funding defined
Project implementation plan drawn up

Extract from 2nd generation NPD Process Document, full copy included in Appendix Q

Figure 5.3: Graphic Representation of Accounting Information in MMD 2nd Generation New Product Development Document



Note: This diagram was prepared by the researcher based on the various stages in the process as set out in the formal document in Appendix Q, as well as detailed discussions with several managers regarding the objective of each stage, who is involved in each stage, the information reviewed in each stage, the accounting information reviewed in each stage and how that accounting information becomes integrated into each stage of the process.

The estimated capital, technical and financial resources which were previously examined in Stage 2 are now examined here. It was decided that there is little point in preparing information of such a detailed nature without first establishing if the product has an adequate market potential.

A prototype is developed and preliminary testing is conducted in the market in Stage 5, *Prototype Development and Testing*. In Stage 6, *Preliminary Financial and Business Case Analysis*, the target price, manufacturing cost, marketing investment, capital expenditure requirement and ROI are estimated as accurately as possible, without significant involvement from Finance. Much of this information was previously examined in Stages 2 and 3 of the process. Again this information is pushed downstream in the process to ensure that it is first established whether there is a market for the product. More extensive market testing is carried out in Stage 7, *Market Testing*, after which the comprehensive business case is prepared by the Finance function in Stage 8, *Business Analysis*. This is the final stage before the completion of capital plant work and the planning of personnel and plant resources, followed by the subsequent execution of product launch plans, advertising and promotion plans and distribution and stocking plans. In effect, the comprehensive business case is prepared immediately prior to the significant commitment of financial resources:

There can be a propensity to get very excited.... We're getting very excited [with *Ebuild*] and we will come to the point internally in the organisation where we're saying 'do we pull the trigger or no?' And I can tell you, the trigger will not be pulled until there is a hard strong business case put across (*Ian, Magma Group Chief Financial Officer*).

This has been identified as the critical investment point in an NPD project:

As we develop products we're not spending too much on development work..... but now [in the latter stages of the project] we're looking at detailed schedules, we're looking at discounted cashflow (DCF) and we're looking at a timeframe of ten years, and what's the net present value (NPV) based on a timeframe and what's a cost of capital and does this stack up and how vulnerable is this to assumptions and how concrete are our capital costs?... I would certainly be looking for reassurance that either Des or Paul have tested this (*Simon, Head of MMD*).

Accounting information within the formal NPD process, and, specifically, accounting information prepared and presented by the Finance function, is relied upon by the Steering Committee to make decisions where the outcome determines the commitment of the Group's financial resources:

Finance are a good test. They test it and say 'well come on guys you really are taking the ... you're over-ambitious or you're under-ambitious etc.... it is control in the loosest sense of the word (*Alex, MMD Director of Sales*).

Accounting information in the earlier stages of the process is restricted to sales projections and high level estimates of capital investment and resource requirements. It does not become prominent until the *Business Analysis* stage and, as the document has evolved, this stage, and therefore the apparent importance of accounting information in the formal NPD process, has moved downstream. At this point, many of the key marketing and design decisions pertaining to the new product have been made. In this formal capacity, accounting information does not feed into a new product's design or development but it is heavily relied upon by the Steering Committee to support any decisions leading to significant financial commitment to the project. The involvement of the Finance function in providing accounting information at this stage adds credibility to this support.

All of the information gathered throughout the process facilitates the completion of a *Project Evaluation Matrix* which scores each project on ROI (the only accounting element), distribution channel, capital requirements, resource requirements, sales skill set, intellectual property issues and marketing resources. Final approval of this checklist results in progression to the *Technical implementation* stage which tracks the completion of capital plant-work and the planning of personnel and plant resources. This is followed by the *Commercial Launch* stage which monitors the development and execution of product launch plans, advertising and promotion plans and distribution and stocking plans. Again, neither of these stages utilise any accounting information.

The process described is being used to track all of MMD's NPD projects in progress (as listed in Table 5.7). Metbuild's *Ebuild* project has progressed through more stages of this process than any other, having reached Stage 5, *Prototype Development and Testing*. This project is examined in Section 5.5.1. Section 5.6 discusses some projects which have been deferred at various stages during the process.

5.5.1 The Ebuild Development

In 2009, Metbuild signed a Joint Development Agreement (JDA) with a UK company whereby both companies will work together to develop *Ebuild*, a non-toxic Beta product which is protected from rot, improving stability and durability. The focus of the project is the development of an effective 'acetylation' process. This process will alter the chemical compound of Metbuild's Beta material resulting in a durable, yet breathable, product. This is a large project requiring significant capital investment. As opposed to developing a single new product, this project is about developing an enhanced manufacturing process which will acetylate the material, thereby allowing Metbuild to develop durable, weather-proof products, which would create enormous new product potential in the future.

Metbuild's JDA partner is providing key information and knowledge in terms of engineering, specialist chemical procurement and logistics. Metbuild is focusing on determining the market segments and size, value analysis, the actual product development and prototyping, testing and certification. To this end, Metbuild is tracking the project with the 2nd Generation NPD document. The project is at Stage 5, *Prototype Development and Testing*. Again, given the sensitive nature of the project documentation, the researcher was not granted permission by Magma to provide a copy of the completed documents in this thesis. The full set of documentation was, however, made available to the researcher and is described below.

Stage 1, *Challenge and Concept Definition*, documents the origins of the *Ebuild* concept, and specifically what the company hopes to achieve in strategic, customer, market and cost-base terms with this development. In response to the proven commercial success of acetylated material in achieving extreme durability, *Ebuild*

seeks to develop an acetylation process for fibreboard which will bring similar durability to their products. This project specifically addresses MMD's strategic objective of growth through increased sales of value-added products. It is anticipated that this will lead to significant profit opportunities.

After completion of this stage, an NPD Team was formed to progress the project. This was led by Pete, Metbuild's Head of Operations, and consisted of Metbuild's Technical and Production personnel, representatives from MMD's Sales and Marketing functions, a range of personnel from *Ucon*, as well as a structural and planning engineering consultant and an environmental consultant. There is no member of Finance on this NPD Team:

There was some debate here a while ago as to whether or not we should have a Finance person sitting on the NPD Project Team. And I think they were right, they decided there was no point. Because what happens is you could have 2 or 3 NPD meetings every month and they could be in London, Dublin, whatever. And there's no point dragging along an accountant and having him sitting there, listening to technical stuff on the product, now I know it gives you a lot of background insight into it which is great, but you can chew up a lot of time with nothing happening... .. I went over to Amsterdam 2 weeks ago and for three quarters of one of the days I was sitting in a room they were talking about whether the condenser should be upright or whether it should be on its side, I mean those kinds of discussions I don't need to be there for (*Des, Head of Finance, Metbuild*).

The formal process progresses to Stage 2, *Early Screening*, during which the product concept is challenged in terms of the criteria set out in Table 5.10. Back-up workings show a forecasted turnover of €35m within 5 years as well as potential royalty income from future licensees of up to €27m over a 10 to 15-year period. This information was largely prepared by members of the NPD Team themselves, with some support from the Finance function when necessary. In general, it is thought that the NPD Team have enough financial know-how to perform these early analyses themselves:

There's a robust enough system within the NPD group themselves, they can handle it themselves (*Des, Head of Finance, Metbuild*).

Stage 3, *Market Analysis*, represents a significant change in the 2nd Generation process as compared with the 1st Generation process. This involves the inclusion of a detailed market analysis early in the process in order to reduce the time spent on products which ultimately will not be commercially successful. Detailed schedules of forecasted sales prepared by members of the NPD Team, primarily Sales and Marketing personnel, indicate that *Ebuild's* demand lies in the 20,000m³ to 40,000m³ range at a sales price point of £1,000 per m³ for raw board. The £1,000 per m³ price point was arrived at by members of the NPD team. The potential market size is described as very sensitive to this price point. Demand will arise across a diverse range of applications, predominantly for value-added offerings such as laminated, coated and primed products, rather than for raw board. 60% of the market opportunity will be accessed through existing MMD channels. Given the fragmented nature of this demand, market build-up is likely to be quite slow, however, the ultimate market size was considered strong enough by the Steering Committee to allow the project to progress to the next stage.

Stage 4, *Project Scope Definition*, defines the project's scope based on a range of criteria, as set out in Table 5.11. Metbuild's Head of Finance, Des, has been working on the financial scoping of *Ebuild* from early in the process, setting out a range of proposed capital projects, all of which are currently under review by the Steering Committee. Table 5.12 sets out the key elements of these four scenarios. Des worked closely with the Head of Operations to prepare the model underlying these scenarios:

Like once you have a reasonable handle on the capital costs you're set to look at your options When you look at the numbers here we're talking about producing about 40,000m³ per year on a plant that's going to cost about €40m. Over 10 years, that's 400,000m³, divide 400,000m³ into €40m, that's €100 per m³ depreciation. Now my depreciation charge here in [Cork] at the moment is about €18 per m³. So a depreciation charge of €75-€100 is significant.... Now that's all well and good but we need a simple model to convey that to the guys (*Des, Head of Finance, Metbuild*).

Table 5.12: Capex scenarios for EBuild project

		A	B	C	D
Average Plant Capacity	M ³	50,000	30,000	25,000	15,000
Maximum Plant Capacity	M ³	66,667	40,000	33,333	20,000
Operating Plan	No. of shifts x weeks per year	4 x 48	5 x 48	5 x 48	5 x 48
Operating Efficiency	Average	90%	90%	90%	90%
Plant Capacity	Tonnes per hour	6.25	4.1	3.13	2.0
Acetylation Plant Capex	€	23,900,000	18,300,000	16,400,000	15,120,000
Add Contingency at 15%	€	3,600,000	2,700,000	2,465,000	2,268,000
Energy Refit	€	9,000,000	7,450,000	7,200,000	5,600,000
Utilisation Costs	€	2,000,000	1,800,000	1,700,000	
Total Capex	€	38,500,000	30,250,000	27,765,000	22,988,000
License Fee to Ucon	€	4,000,000	2,400,000	2,000,000	1,200,000
Typical Depreciation	€ per m ³ per year	58	76	86	115

Extract from back-up workings to project scope definition stage of EBuild NPD Process

Des agrees that he has had more involvement at an early stage of this process than he has had in previous NPD projects:

The accounting team... yeah, we're a lot more involved in *EBuild*, we wanted to be really, it's big business..... so we're pulling this information together initially. ...we work with the Operating guys and the guys from *Ucon* and they're saying 'we need to get this from it', 'these are the things you're looking for' and also then trying to ensure that we're all talking the same language and nothing is getting lost in translation... You have to take a lot of figures with a pinch of salt at these early stages. We [Finance] are happy enough with the cheap and nasty when things are still loose (*Des, Head of Finance, Metbuild*).

Ebuild has, to date, undergone a lengthy period of *Prototype Development and Testing*. Two full-scale production trials have been completed and initial results show outstanding durability and good accelerated weathering performance. Durability, thickness swell and stability are significantly better than in comparable products and compare favourably to non-wood exterior materials. This stage is ongoing. However, given the positive results to date combined with the size and value of the project, the NPD Team has begun working on Stage 6, *Preliminary Financial/Business Case Analysis*. With, what team members themselves describe as 'excellent', support from Metbuild's Head of Finance, detailed sales revenues, costings and returns have been prepared based on the four capital expenditure scenarios outlined in Stage 4.

If *Ebuild* proceeds to launch, John, Metbuild’s Managing Director, anticipates that it will be commercial by 2013, meaning that it is now one and a half years into a possible four-year project. According to John, the degree of innovation and potential value stream associated with *Ebuild*, as well as the JDA negotiations with *Ucon*, have resulted in the earlier stages of this NPD project taking longer than any previous MMD NPD project.

5.6 DEFERRED NPD PROJECTS

If it is decided at any of the stage-gate reviews that a project should not progress, it is not rejected, instead, it is either ‘parked’ or ‘banked’. ‘Parked’ means that the project is considered viable in the long term but it is put on hold to resume when the requisite resources become available. This could range from securing capital finance to freeing up labour resources. ‘Banked’ means that the project, as it is currently presented, has not been considered viable but it will be revisited at a later stage if there is a change in the project parameters, such as revised input costs or changes in the marketplace. Table 5.13 sets out MMD’s current list of ‘parked’ or ‘banked’ projects.

Table 5.13: Deferred NPD projects

	Stage in NPD Process	Project	Status
Metbuild			
1	Stage 4 <i>Project Scope Definition</i>	Deferred Metbuild 1	Parked
2	Stage 4 <i>Project Scope Definition</i>	Deferred Metbuild 2	Parked
3	Stage 3 <i>Market Analysis</i>	Deferred Metbuild 3	Banked
4	Stage 3 <i>Market Analysis</i>	Deferred Metbuild 4	Banked
5	Stage 4 <i>Project Scope Definition</i>	Deferred Metbuild 5	Banked
6	Stage 2 <i>Early Screening by Steering Committee</i>	Deferred Metbuild 6	Banked
Topwood			
7	Stage 3 <i>Market Analysis</i>	Deferred Topwood 1	Banked
8	Stage 4 <i>Project Scope Definition</i>	Deferred Topwood 2	Parked

Magma Group Board Report, July 2010

Projects are ‘parked’ or ‘banked’ for a variety of reasons as discussed throughout the remainder of this section but it is worth noting that all of these projects were ‘parked’ or ‘banked’ before they were subjected to a detailed financial analysis. This suggests that accounting information has little to do with the critical decision to defer a project. However, the findings do provide evidence of financial input to these decisions, in a

more informal capacity. This is discussed in Section 5.7. ‘Parked’ or ‘banked’ projects are reviewed periodically in order to ascertain if any of the projects’ circumstances or parameters has altered to the extent that the projects might recommence.

Deferred Metbuild 1 (Project Number 1 in Table 5.13 above) was ‘parked’ at Stage 4, *Project Scope Definition*. While the product was considered viable from a market perspective, therefore progressing through Stage 3, *Market Analysis*, capacity limitations mean that the company does not currently have the requisite manufacturing capacity for it, with the result that the project is ‘parked’ and will be revisited when Metbuild’s manufacturing circumstances change. *Deferred Metbuild 2* (Project Number 2) was ‘parked’ at Stage 4 for the same reasons.

Deferred Metbuild 3 (Project Number 3) was ‘banked’ after the market analysis revealed that there is no significant appetite for this product in the marketplace. *Deferred Metbuild 4* (Project Number 4) was ‘banked’ at the same stage. The market analysis revealed that there was some demand for the product but the volumes were not sufficient to justify any further investigation.

Deferred Metbuild 5 (Project Number 5) were ‘banked’ at Stage 4, *Project Scope Definition*. There was a strong desire for the product in the marketplace so it progressed through Stage 3, *Market Analysis*, but Metbuild did not have the manufacturing capability for it, at least not without significant investment.

Deferred Metbuild 6 (Project Number 6) was ‘banked’ at Stage 2, *Early Screening* after the high level quantitative assessment suggested that the project was too significant in terms of capital and labour resources and too risky to be considered at the same time as the *EBuild* project.

Deferred Topwood 1 (Project Number 7) was ‘banked’ at Stage 3 when the market analysis revealed that there was little desire for the product in the marketplace. *Deferred Topwood 2* (Project Number 8) has been ‘parked’ at Stage 4, *Project Scope Definition*. The project was considered feasible at Stage 2, *Early Screening*, and the market analysis in Stage 3 revealed an identifiable market. However, the Steering

Committee have asked that the project team develop more technical expertise before they will be willing to revisit it.

All of these projects were ‘parked’ or ‘banked’ before reaching Stage 6, *Preliminary Financial and Business Case Analysis* and Stage 8, *Business Analysis* but accounting information was frequently reviewed by the NPD Team themselves in the earlier stages, often contributing significantly to the decision to defer. For instance, the market analyses conducted for *Deferred Metbuild 1* and *Deferred Metbuild 2* (Projects Numbers 1 and 2 respectively) were based on a range of price points ascertained by the NPD Team, predominantly by members of the Sales and Marketing function. *Deferred Metbuild 5* (Project Number 5) was banked as a result of a rudimentary capital investment appraisal conducted by Metbuild’s Head of Operations. *Deferred Metbuild 6* (Project Number 6) was ‘banked’ after members of the team themselves gave consideration to the extent of the labour resource requirement that would be necessary, together with an early estimation of the requisite capital investment. This demonstrates how these Metbuild projects were, to some extent, screened financially by the NPD team before they progressed to the detailed financial stages involving Des and the Finance team.

5.7 INFORMAL USE OF ACCOUNTING INFORMATION

When initially asked to discuss NPD and the accounting information reviewed during NPD, managers immediately referred to the formally documented process and the pro forma schedules of accounting information reviewed in this context. However, further probing revealed that several managers use accounting information on an informal basis, particularly in the early stages of development. When asked when accounting information is used during NPD, Metbuild’s Head of Operations, Pete, described the review of some ancillary information in Stage 6, *Preliminary Financial Analysis and Business Case* with a more detailed review in Stage 8, *Business Analysis*. (This is consistent with the description of the formal NPD process in Section 5.5). When asked if he would use any accounting information at an earlier stage, he responded in the negative. The interview was interrupted by Metbuild’s Head of Finance, Des, who wished to clarify what time he was meeting Pete to discuss the *Ebuild* project. At this

point, *EBuild* was at Stage 4, *Project Scope Definition*, and no accounting information would have been under review as part of the formal process. The researcher asked Pete what the meeting was about and enquired as to why, given the early stage of the project, he was engaging with accounting information or the Finance function at all. He explained:

I'm just pulling together some analyses of the costing implications of getting upright condensers versus flat condensers for the new *EBuild* plant. I just want to run through some of the figures with Des (*Pete, Head of Operations, Metbuild*).

This was the researcher's first insight into the use of accounting information on an informal basis during NPD in *Metbuild*. When probed on this, Pete was amused and suggested that he had not considered this accounting information because it was:

back of a matchbox stuff (*Pete, Head of Operations, Metbuild*).

These analyses are outside of the formal process. They are not reviewed by the Steering Committee and were not initially highlighted by any party in discussions about the use of accounting information throughout the project. In addition, many of the decisions taken to defer projects, as outlined in Section 5.6 above, are based on financial analyses conducted by members of the NPD team early in the process:

The main thing for NPD is that we get an idea and we develop some early stage screening, and this must be financially based. This first screening comes down to financials - 'is the hill worth the climb?' - and if you think the numbers look ok, you go into more depth... and you bring in more expertise (*John, Managing Director, Metbuild*).

The managers on the NPD Team who are actually engaged in NPD activities (as opposed to the Steering Committee who oversee NPD), describe accounting information as having a far greater day-to-day role than that presented in the formal NPD process. In this context, accounting information is drawn upon by NPD Team members casually, and even subconsciously:

Everything we do here, we develop something and the unit of measure is m^3 and everything comes down to that. And my area is cost per m^3 , that's where I come in, my life revolves around cost per m^3 ... (*Pete, Head of Operations, Metbuild*).

This is not structured or aggregated in any consistent, recognisable format. It is carried out as needed and is more intuitive in nature. Pete suggests that such accounting analyses might be performed at lunch on a copy of the newspaper. It is not readily identified as accounting information but rather is considered part of the general discussion of the project. This is facilitated by MMD's cross-functional approach to NPD:

We set the tone at the top really in terms of what will pass muster. The cultural side for me is changing to a different type of governance to the current one which is.. well 'self regulation' is the wrong phrase but the guys working on the project teams are all on cross-functional teams ... they will have an inbuilt thing of challenging each other and that's on the numbers as well (*Bill, Chief Executive of Magma*).

Accounting information used in this informal capacity in the earlier stages of NPD is prepared primarily by NPD team members themselves, sometimes with some support from Finance. This is because it is considered difficult for Finance to prepare a meaningful financial analysis at the early 'fuzzy' stage of the process:

You can't just say to your Finance guys 'go and cost that' if the thing does not exist... we need to get together and say 'we need a plant this size, it'll cost this etc etc' and we build a model together (*John, Metbuild, MD*).

As the NPD project progresses, the nature and purpose of accounting information changes. The informal, often casual, financial analyses carried out by the NPD team members at the early stages of the process is replaced by the detailed, complex analyses presented to the Steering Committee at the stage-gate reviews. This is when the Finance function becomes more involved in NPD:

I mean we would brainstorm together and if we get a product and we're working on one at the moment that will probably be presented to the next MMD meeting, while it is internal here in ..., I can do the numbers and John can do the numbers, but if it goes to MMD, Des will have to get involved because it has got to stand up to scrutiny. And it is more than likely that Des will be presenting it anyway. And if I was presenting, Des would take over once the numbers come up (*Pete, Head of Operations, Metbuild, May, 2007*).

The informal use of accounting information is not exclusive to Metbuild. Topwood's Head of Operations also describes the necessity to prepare and review accounting information at the earlier stages of the process, though his attitude to accounting information is not as positive as that of his counterparts in Metbuild:

At the initial stages [of an NPD project] the project manager will scope out the project technically and from a financial point of view, he will research the

payback and he will assemble the cost estimates.... We do it ourselves. In other companies there would be a project accountant assigned, but not here (*Jack, Head of Operations, Topwood*).

Accounting information generally does not appear to be regarded with the same degree of importance in Topwood as it is in Metbuild:

I mean it is not rocket science. All you need is a set of accounts and a bit of financial analysis around that to be able to compare apples with apples (*Nick, Managing Director, Topwood*).

This provides evidence of differences in the perceptions held by managers in Topwood regarding the role of accounting information in NPD compared to their counterparts in Metbuild. These differences are explored further in the next chapter, in which the perceptions held by Topwood managers are examined in Sections 6.3 to 6.5 and the perceptions held by Metbuild managers are examined in Sections 6.6 to 6.8.

5.8 CONCLUSION

This chapter presented the first phase of the findings of an in-depth field study of the manufacturing division (MMD) of the Magma Group. MMD consists of two plants - Topwood and Metbuild - each of which manufactures a range of products for the domestic and export markets. MMD has a single NPD Steering Committee which reviews NPD projects at a series of stage-gates to decide if they should progress to the next stage. Representatives from both plants have been involved in the development of a formally documented NPD process which tracks the NPD project through each of these stages.

Within this formal process, some accounting information is reviewed in the early stages. However, accounting information is most prominent during the *Business Analysis* phase, when the Finance function presents the Steering Committee with a comprehensive business case for the proposed new product. As the formal process has evolved, this stage has moved further downstream. In this formal context, accounting information is most heavily relied upon by the Steering Committee to support decisions leading to the significant commitment of financial resources to the project.

There is also evidence of accounting information being used in an informal manner by managers engaged in NPD on a day-to-day basis. In this context, accounting information is regarded as a given language used by members of the NPD Team to form an early picture of the potential new product, a picture which is refined and improved as more information is gathered. This information is generally collated by members of the NPD Team themselves, with some support from Finance if necessary.

There are clear differences in the use of accounting information by the Steering Committee and by the NPD Team. At a relatively late stage in the process, the Steering Committee reviews carefully aggregated pro-forma schedules of accounting information which are prepared by the Finance function. Meanwhile, members of the NPD Team draw on more basic, less sophisticated accounting information in order to discuss and deliberate over NPD issues from the outset of a development project.

The findings also provide evidence of contrasts in the use of accounting information by managers in Topwood and Metbuild. Metbuild's managers describe accounting information as a 'taken-for-granted' language which drives NPD. Topwood's managers recognise its importance throughout the process but are less enthusiastic about its benefits than their Metbuild counterparts.

These findings demonstrate how managers in different circumstances throughout the Group use accounting information in different ways. They also demonstrate how these managers often differ in their perceptions of what constitutes accounting information. The rules and normative expectations associated with the formal NPD process clearly inform how the Steering Committee use accounting information. The institutionalised routines and recognisable language of the Finance function influence the NPD Team's informal use of accounting information. However, these institutionalised structures cannot be examined in isolation from the human beings who draw on them. These findings reveal that managers in similar, or at least comparable, circumstances also use accounting information in different ways. Topwood and Metbuild's respective Managing Directors, both members of the Steering Committee, demonstrate contrasting perceptions of the role of accounting information. So too do the respective Heads of Operations, each of whom was equally involved in the development of the formal NPD process. This suggests that a manager's action is guided as much by his

individual phenomenological perspective as it is by the social institutions he confronts. This recognition of the significance of agency and structure is the central tenet of Structuration Theory, which is the theoretical lens through which these findings are explored in the next chapter.

Chapter Six

A Structuration Analysis of Topwood and Metbuild

6.1 INTRODUCTION

The findings presented in Chapter Five provide important insights into the managers' use of accounting information during NPD. The findings describe how accounting information is relied upon by members of the Steering Committee to support decisions regarding financial investment in NPD. These decisions take place during the latter stages of the process. Accounting information is relied upon by members of the NPD Team, from the early stages of the process, to support decisions regarding product feasibility and design. Managers in Metbuild describe accounting information as a 'taken for granted' language. The corresponding managers in Topwood demonstrate less enthusiasm for the day-to-day use of accounting information. These managers' use of accounting information is affected by the varying normative expectations and institutionalised routines they are confronted with. However, the findings also indicate that it would be a mistake to separate these institutionalised structures from the human beings who draw on them. The Managing Directors in Topwood and Metbuild, both members of the Steering Committee, have contrasting perceptions of accounting information. The Heads of Operations in each company, both of whom were involved in the development of the formal NPD process and are regular members of NPD Teams also differ in their perceptions of the role of accounting information in NPD. These insights provide evidence that a manager's use of accounting information during NPD is affected as much by his phenomenological perspective as it is by the normative routines associated with the NPD process. The purpose of this chapter is to explore these findings in more depth.

Structuration Theory is discussed in detail in Chapter Three. Giddens' original structuration construct emerged as a middle ground between structuralism and individualism. It is based on the premise that structure and agency are not a mutually interacting duality but are, simultaneously, both the medium and the outcome of social interaction (3.2). Stones (2005) enhances our understanding of this duality of structure through his presentation of the quadripartite nature of structuration which, when applied to a particular agent, can provide a substantive insight into that agent's behaviour (3.4). This insight recognises that an individual's actions are guided by his own internal structures as well as by external social structures, with each reinforcing

and informing the other. This cycle of structuration is happening in many different places at the same time, with agents differently situated within a given conjuncture, so this process of analysis may be applied in turn to a range of agents-in-focus. Stones describes this as the application of a composite research strategy.

The means by which the data were collected and analysed are presented in detail in Chapter Four. Findings from the first stage of data analysis were presented in Chapter Five. This chapter will set out the findings from the second stage of data analysis. Section 6.2 provides a brief recap of the composite research strategy applied to the findings and explains the layout of the remainder of the chapter.

6.2 A STRUCTURATION PERSPECTIVE

Stones (2005) provides methodological guidance to researchers who choose to use Structuration Theory to understand a specific phenomenon in a particular time and place (4.10). This guidance outlines four primary steps: from within the bracket of conduct analysis, identify the general dispositional frames of meaning of an agent-in-focus (Step 1); from within these general dispositional frames of meaning, identify the conjuncturely specific internal structures of that agent-in-focus (Step 2); within the bracket of context analysis, identify the relevant external structures, the position practices that routinely constitute them, the authority relations within them and the material resources at the disposal of the hierarchically-situated agent (Step 3), and; specify the possibilities for action and structural modification allowed by these external structures (Step 4).

As described in Chapter Four, the use of varying agents-in-focus is a tool with which the case data may be analysed a number of times, each time using a different manager as a lens of analysis. The means by which the agents-in-focus were selected is presented in Section 4.10.1. This composite approach acknowledges the web-like nature of interdependencies between processes of structuration and recognises that a given agent may be first and third person depending on whom the lens of structuration is focused on at any one time. This means that in a given agent's analysis, the other five agents-in-focus themselves become agents-in-context within that agent's

community of practice. Agents-in-context also include an agent’s networked others situated throughout the group. Often the perceptions of managers at MMD or at Magma group headquarters provide valuable insight into a given agent-in-focus or perhaps corroborate important issues which emerged in an interview with that agent-in-focus.

Figure 6.1 provides an overview of the layout of the remainder of Chapter Six.

Figure 6.1: Overview of structuration analysis of agents-in-focus

<i>Type of analysis</i>	<i>Focus of analysis</i>					
Agent’s Conduct Analysis	Internal Structures			Dispositional Frames of Meaning		
				Conjuncturally Specific Internal Structures		
Agent’s Context Analysis	External Structures, including possibilities for action and structural modification allowed by these external structures					
<i>6 Agents-in-focus</i>	Topwood			Metbuild		
	Jack	Paul	Nick	Pete	Des	John
	Head of Operations	Head of Finance	Managing Director	Head of Operations	Head of Finance	Managing Director
	Member of NPD Team	Supports NPD Team and Steering Committee	Member of NPD Steering Committee	Member of NPD Team	Supports NPD Team and Steering Committee	Member of NPD Steering Committee
<i>Section where analysis is presented</i>	6.3	6.4	6.5	6.6	6.7	6.8

Sections 6.3 - 6.5 present the results of the structuration analysis for the three agents-in-focus from Topwood. Section 6.3 begins with a brief recap of Topwood and its products. It provides a brief overview of Jack's background specifically. The remainder of Section 6.3 sets out the results relating to Jack. Section 6.3.1 presents the results of the analysis of Jack's dispositional frame of meaning (Step 1). Section 6.3.2 presents the results of the analysis of Jack's conjuncturely specific internal structures (Step 2) and Section 6.3.3 presents the results of the analysis of Jack's external structures and the possibilities for action and structural modification allowed by these (Steps 3 and 4). Step 4 requires a closer examination of the agent's external structures and explores the extent to which these structures enable or constrain the agent and how they might be modified as a result. The enabling or constraining nature of external structures is identified in the results of this analysis and the implications in terms of possible modifications of all structures, both internal and external, are discussed in Chapter Seven. Sections 6.4 and 6.5 present the corresponding results for Paul and Nick respectively.

The chapter goes on to present the results of the structuration analysis for the three agents-in-focus from Metbuild. Section 6.6 sets out the results relating to Pete, Section 6.7 sets out the results relating to Des and Section 6.8 sets out the results relating to John. Section 6.9 concludes the chapter.

6.3 TOPWOOD'S HEAD OF OPERATIONS - JACK

Topwood manufactures a range of Alpha products and has been a full subsidiary of Magma since 2002. A detailed account of Topwood's products and markets, history and financial performance was presented in Section 5.2.3. In brief, Topwood makes commodity products which are suited to DIY and building applications. The plant was constructed in the early 1990s and has received little or no investment since then. Topwood's most recent new product launch was '*BuildSafe*' in 2009.

Jack is the Head of Operations in Topwood. He has worked for the company for eleven years, starting out as an engineer in 2000. He is a chemical engineer by qualification, and previously worked in an R&D role in a large US multinational

manufacturing company before moving into an operations role when commencing his employment in Topwood.

6.3.1 Jack's dispositional frame of meaning

Stones' methodological bracketing begins with the agent's conduct analysis, specifically, an examination of the agent's dispositional frame of meaning. All of Jack's responses reveal that he is enthusiastically dedicated to technological advancement and the development of new products and processes in Topwood:

We're innovative, we want to create, we've got a need, let's do it (*Jack, Head of Operations, Topwood*).

Magma's Chief Financial Officer recognises Jack's innovative spirit:

Jack sees the place as an engineering plant with interference from the Finance side... he reluctantly attends the meetings saying 'can we not just get on with it, why are you [Finance] even interested?' (*Ian, Magma Group Chief Financial Officer*).

This illustrates Jack's enduring dispositional commitment to innovation and NPD. An agent's dispositional frame of meaning refers to his 'generalised world views and cultural schemas, classifications, typifications of things, people and networks, principles of action, typified recipes of action, deep binary frameworks of signification, associative chains and connotations of discourse' (Stones, 2005, p.88). Jack's dispositional perspective was conditioned and developed during his education and career to date:

I'm a chemical engineer by qualification and I had always worked in a project environment before coming here so this type of [product development] stuff is second nature to me (*Jack, Head of Operations, Topwood*).

His generalised stocks of knowledge and overall frames of meaning, from which his commitment to innovation and technological advancement are born, were built up during his engineering studies and further reinforced during the years in which he worked in an R&D project environment prior to joining Topwood. This has shaped the perspective from which Jack views Finance:

So you spend a lot of time searching for things... 'well if I reduce my scrap budget here and reduce this cost there', because any savings you make in a project get taken off your bottom line straight away and that's the kind of

thing they [Finance] are looking at. .. but you could have created €10m in sales and that seems to be forgotten about... when we developed *BuildSafe* it was survival of the company because it was only a matter of time before we wouldn't be able to sell our product, we wouldn't have been able to compete but I don't think they look at that as valuable (*Jack, Head of Operations, Topwood*).

Jack is extremely eager for the Topwood plant to be upgraded. He has been involved in the preparation of estimates to scope the project and is described by Magma's CFO as Topwood's most vocal lobbyist for a plant upgrade:

Every time we [Magma HQ] talk to Topwood the possibility of a plant upgrade is discussed... Jack is bullish on this... but it's a massive investment for the group (*Ian, Magma Group Chief Financial Office*).

6.3.2 Jack's conjuncturely specific internal structures

While dispositional internal structures describe the more transposable, generalised schema inherent in each agent, conjuncturely internal structures refer to those schema associated with the agent's specific role. In other words, different roles or tasks have particular interpretive schemes, normative expectations and power capacities associated with them. As discussed in Chapters Two and Four, this is very similar to the three Giddensian structures of signification, legitimation and domination. In this study, Giddens' terminology is used in each examination of the agents' conjuncturely specific internal structures. However, conjuncturely specific internal structures as presented by Stones differ from Giddens' original conception of 'virtual' internal structures in that Stones is concerned with the internal knowledgeability required to deal with specific contextual circumstances. While Giddens' terminology is used here, the analysis reflects Stones' 'outward looking' understanding of these structures.

Jack engages with accounting information primarily during the *Business Analysis* phase of the NPD process. In this context, he draws on accounting information as a legitimation structure with which he must justify his decisions in the latter stages of NPD:

The Finance department set gates and before they sign off [on these gates] they want to see a certain amount of due diligence ... so there's a number of financial hurdles that they set... (*Jack, Head of Operations, Topwood*).

Legitimation structures communicate a set of values and ideals about what is important or unimportant, and about what ought to happen and what ought not happen (Giddens, 1984). Jack believes that accounting information provides a very narrow perspective on the economic implications of decisions:

The financial view is ‘show me the money’ [*bangs fist on table*], ‘what’s my investment, what’s my return, and if you don’t get it we’re going to have your hide’ and that is the attitude. It is very rigid and very strict..... [accounting information] is very one-dimensional. It is bottom line. It doesn’t take into account the different facets of the picture (*Jack, Head of Operations, Topwood*).

The views of Magma’s Chief Executive on the role of financial analyses during NPD support Jack’s perceptions in this regard:

The essence of any financial analysis is a model that says ‘can we do it?’... it spits out the numbers that will be presented to the Board... ‘if the ROI is X and the payback is Y with an investment of 30 million or whatever’, then we can say ‘yes we can’ (*Bill, Chief Executive of Magma*).

Jack describes accounting information as being deeply implicated in the reproduction of values and ideals representing the interests of one party, in this case the controlling company Magma. These conflict with Jack’s own values and ideals. The existence of this conflict is significant. It arises because the legitimation structures drawn upon by Jack are intrinsically tied to certain underpinning domination structures that set out the order of dependency and autonomy within the Magma Group. Ultimately, Jack views accounting information, and therefore the Finance function, as Magma’s means of controlling his NPD activities, and this is in direct conflict with his dispositional commitment to innovation:

The technical guys are pushing the pedal to the metal, we just want to go here, and sometimes that’s without realising the financial consequences... But the Finance guys are pulling the handbrake all the time, no you can’t do that, you can’t do this, you can’t do that (*Jack, Head of Operations, Topwood*).

Jack accepts the need to financially scrutinise NPD projects but he resents Magma’s use of this financial scrutiny as a means with which to hold him and the NPD Team accountable for their behaviour during NPD. He believes that this issue could be addressed by a change in the role played by the Finance function:

I want an accountant who is on my side, fighting my battles and not pulling away from me all the time... someone who speaks a common language (*Jack, Head of Operations, Topwood*).

Jack's innovative drive, combined with his role in NPD, clearly influences how he views his external terrain. The next section will examine this external terrain in more detail.

6.3.3 Jack's external structures

While conduct analysis identifies those structures that are intrinsic to the agent, context analysis examines the agent's structural conditions of action (Stones, 2005, p. 109). MMD's formally documented NPD process provides a set of routine practices in which everybody engaged in NPD must participate. While Jack appreciates the need for a formal NPD process to track a new product's development, he resents the extent to which it slows projects down, describing the process as a 'pain in the neck!'

Within that process, each manager engages with accounting information to varying degrees. The analysis at Section 6.3.2 discusses the internal structures drawn upon by Jack when he engages with accounting information during NPD but the information itself is a key element of Jack's structural conditions of action. As set out in Section 5.7 Jack first encounters accounting information in the early stages of the NPD process when members of the NPD Team perform some simple cost estimates and payback calculations. However, Jack is more influenced by the role of accounting information as part of the formal NPD process, as set out in Sections 5.4 and 5.5. The Steering Committee relies on the information presented at the formal stage-gate reviews to decide if an NPD project should progress to the next stage of the process. Some accounting information is reviewed in the earlier stages, but it is most prominent during the *Business Analysis* stage when the Finance function presents the Steering Committee with a comprehensive business case for the new product idea. In this context, Jack considers accounting information to be a constraining external structure which limits his freedom to be innovative and creative:

What matters to them [the Steering Committee] is euros... an excel spreadsheet with a bunch of numbers and columns on it.... That is how they make their decisions... I just have to deal with that (*Jack, Head of Operations, Topwood*).

The parent company, Magma, is also perceived by Jack to be a constraining external structure which inhibits his creativity because of its reliance on financial data:

It is a huge administrative burden. It adds a layer of people. I mean we have a Finance department that's bigger than some multinational operating teams I've worked with overseas. And the excuse is to provide data for Magma. Just to feed that monster... it is a pain in the ass (*Jack, Head of Operations, Topwood*).

The analysis of Jack's conjuncturely specific internal structures in Section 6.3.2 provides important insights into the impact of the parent company as an external structure. Jack's internal legitimation structures are deeply entrenched in the associated domination structures that set out the order of dependency and autonomy within the Magma Group. His perception of Magma as a constraining external structure is borne out of his internal knowledgeability, which influences how he views his external terrain. This is important in terms of illustrating the interaction between internal and external structures. As described in Chapter Three, Giddens can be credited with recognising the importance of an agent's internal knowledgeability within a given contextual conjuncture, having labelled them structures of signification, legitimation and domination. Stones developed this by providing a model which helps us to relate this internal knowledge to external structures. These findings illustrate the value of Stones' model. This is discussed further in Chapter Seven (7.5.2.1 - 7.5.2.2).

6.4 TOPWOOD'S HEAD OF FINANCE - PAUL

Paul has been Head of Finance in Topwood for six years. He qualified as a chartered accountant in 1986. Prior to joining Topwood, he worked as a financial accountant in a multinational manufacturing company. As Head of Finance, Paul describes his role as one of providing financial leadership and he refers to the Finance function as a key support to the rest of the business.

6.4.1 Paul's dispositional frame of meaning

An agent's dispositional frame of meaning encompasses the 'taken-for-granted' values and norms inherent in the individual (Stones, 2005, p. 88). Paul, as a trained accountant, and having worked in Finance throughout his career, values the 'taken-for-granted' routines and structured practices associated with accounting information:

It is the structure it [accounting information during NPD] puts around everything. It forces you to gather information in a structured manner, even before you do any formal analyses. It gives you a defined list of things to look at (*Paul, Head of Finance, Topwood*).

Paul demonstrates a dispositional commitment to bottom-line profitability and he views accounting information as the ideal tool with which to achieve this:

Well the numbers will speak for themselves. It's a basic rule - unless you can sell it for a higher price or we can make it for a lower cost, it is going nowhere and everybody understands that (*Paul, Head of Finance, Topwood*).

Magma's Director of Marketing describes Paul as someone who appreciates the needs for rules and order:

Paul to me is like the referee in the game... he's not in the game, he's the ref. He can send people off, he can give a yellow card and he can blow the whistle... He's not playing but God he's important, there'd be mayhem without him (*Alex, Director of Marketing, MMD*).

Paul certainly demonstrates a willingness to consider broader criteria and engage in issues of a strategic nature, at least early in the NPD process:

Number one, you have to have idea generation and innovation and you need the vocabulary and the language to facilitate that, and that's most important. Then you have to look to Sales and Marketing and examine customers and market share. Then, can we make it?, so you have that. Then how much is it going to cost?, and that's where the financials come in... You have to have the culture there to create ideas and Finance can't come in too early to eliminate that. Finance comes in to support the ideas (*Paul, Head of Finance, Topwood*).

Paul's implies here that he is committed to idea generation and innovation but the rest of the study's findings suggest that his actions don't necessarily reflect these ideals. None of the other managers interviewed describe Paul as having demonstrated any particular commitment to innovation. Topwood's Head of Operations suggests the

opposite (6.3.2). Despite some assertions to the contrary Paul's overriding commitment remains the product's financial viability:

From a new product perspective, you can't put that kind of [significant] investment into something new that's not financially viable regardless of the market (*Paul, Head of Finance, Topwood*).

This inconsistency with regard to Paul's dispositional frame of meaning is examined in more detail in Chapter Seven (7.2.4).

6.4.2 Paul's conjuncturely specific internal structures

From within his dispositional commitment to profitability, Paul draws on accounting information as a key legitimisation structure underpinning all NPD decisions:

I mean, it has got to stand up financially, you've got to have some logic for it, there has to be a filter of some sort (*Paul, Head of Finance, Topwood*).

Given that Paul is primarily responsible for Topwood's financial performance, he believes that accounting information communicates and instils a sense of profit-consciousness throughout the organisation. This is evident in the formal NPD document which includes specific elements of accounting information at certain stages in the process, as well as in the informal, communal practices of the NPD Team, who instinctively use accounting information to make day-to-day NPD decisions.

Paul illustrates this by referring to the documentation pertaining to the development of Topwood's *BuildSafe* product (for confidentiality reasons, a copy of this document cannot be provided in this thesis but it takes the form of the template for the 1st Generation NPD process document included in Appendix P). The proposed new product is predicted to show a return²⁵ of 33% by 2009, resulting in approval at the stage-gate review allowing progress to the next stage of the process. According to Paul, a project of this nature would only be permitted to progress if it showed an anticipated return within two years of at least 20%. Accounting information is being used here to clearly set out normative rules of conduct surrounding NPD. By engaging

²⁵ 'Return' in this context refers to ROI

with accounting information in this manner, managers, as agents, reproduce these normative rules.

Furthermore, while these rules communicate the parameters within which the Steering Committee make their stage-gate decisions, over time, they filter down and inform the NPD Team as they make their day-to-day NPD decisions. This illustrates how the legitimation structures drawn upon by Paul are intrinsically tied to underlying signification structures. The interpretive schemes and discursive practices framed in accounting are relied upon to communicate meaning based on the norms and rules imposed by the legitimation structures.

6.4.3 Paul's external structures

Paul exists within a web of external structures and their associated position practices. The NPD Team, the Steering Committee, the parent company, Magma, and the various managers within Topwood all require accounting information of different types with different degrees of formality and at different times. For instance, Jack, Topwood's Head of Operations, wants a project accountant who supports his NPD activities from early in the process (6.3.2), while Magma wants a gatekeeper who screens and challenges new products, particularly before the company commits financial resources to the project:

They [Finance] have a stewardship function first and foremost (*Bill, Chief Executive of Magma*).

These requirements frequently conflict with each other, presenting challenges for Paul as he attempts to reconcile the competing demands of these external structures.

Paul has attempted to deal with these accounting information demands by empowering everybody in Topwood to understand the financial implications of their own decisions:

It saves me grief. There's no point in them coming with something and then me knocking it back. They've wasted a load of time and you come along and say 'sorry lads this ain't gonna fly', like how long will it take me to convince them, whereas if they see it themselves... (*Paul, Head of Finance, Topwood*).

Paul believes that accounting information provides a framework with which NPD projects may be analysed in a logical and comparative manner and he believes this is facilitated by a strong financial literacy throughout Topwood, a financial literacy deliberately encouraged and supported by Paul himself:

[It comes from] years of beating it into them! (*Paul, Head of Finance, Topwood*).

However, Paul's efforts in this regard are not recognised to any great extent by his colleagues in Topwood. Jack describes the NPD process and the accounting information reviewed within it as a necessary evil, with which the NPD team have struggled and Nick maintains that Topwood's Finance function have made no particular effort, in his view, to empower or equip the rest of the company with any particular financial know-how:

... Our guys, they struggled, hugely, I mean in terms of the financials etc.. I mean a lot of it initially has been quite infantile to an extent. And maybe that's being overly critical, they've got the basics and the technical, there's been very little to help them write out a format that will tell a stranger what they're doing, 'cause the Finance guy is a stranger to them in terms of technology. So he reads it, he wants to know everything, whereas the guy who knows the product intimately thinks the paperwork is a pain in the ass anyway, how he presents it is quite cryptic... it's very difficult, extremely difficult. And our guys have really struggled over that (*Jack, Head of Operations, Topwood*).

In addition to the external structures and associated position practices within Magma, Paul also refers to the independent causal influence of Topwood's competitive market:

The environment we're operating in, you wouldn't say it is a luxurious market, or a market with high margins, it is cut-throat. It is commodity, so you've got to be on your toes in terms of looking at your returns the whole time. So we need to understand very quickly if this idea is going to do anything to help us, is it going to make money? And we need to build up that information very quickly so we can make those decisions, and we do here, to be fair (*Paul, Head of Finance, Topwood*).

Paul's commitment to financial accountability and his reliance on accounting information to legitimise NPD decisions and monitor NPD behaviour is underpinned by Topwood's competitive market, in which margins are tight and returns are not guaranteed.

6.5 TOPWOOD'S MANAGING DIRECTOR – NICK

Nick has been the Managing Director of Topwood for four years. He is an engineer by qualification and joined Topwood as a college graduate, working his way up to his current position. Nick is a member of the MMD Steering Committee which reviews the NPD process document at each stage-gate before deciding whether or not a project should progress to the next stage. He rarely has any significant involvement with Topwood's NPD Team and encounters accounting information only as part of the formal NPD document.

6.5.1 Nick's dispositional frame of meaning

A noted feature of Nick's participation in the study was that his responses were quite brief. Nevertheless, despite his measured responses, he demonstrates a strong dispositional commitment to the Magma Group's overall strategy:

The most important part of the process really is getting your concept right and getting your [product] definition right, is it strategically sound?... then someone has to own the project... but we must be very clear on what it is we're trying to achieve (*Nick, Managing Director, Topwood*).

The long-standing and durable aspects of Nick's dispositional frame have been formed throughout his developing career in Topwood. Nick has never occupied a full-time position in another company. He joined Topwood as a college graduate, quickly progressing to a senior management role in which he works closely with personnel from MMD and the parent company, Magma. His ideological schema has been built up through these ongoing interactions with Magma at a corporate level.

Nick is interested in where the project fits in terms of Magma's overall story, as opposed to only in relation to Topwood. For him, it is less about the new product and more about achieving the Group's objectives.

6.5.2 Nick's conjuncturally specific internal structures

Unlike his Topwood colleagues, Jack and Paul, Nick is not involved in the day-to-day activity of Topwood's NPD projects:

From my point of view, from the Managing Director's point of view, I have oversight of this process... (*Nick, Managing Director, Topwood*).

As a result, he relies on the information contained within the NPD document to understand the detail of the project and to assess its progress. In particular, Nick refers to the broad range of contributors to the NPD process and the difficulties associated with coordinating these varying perspectives. In this context, Nick is drawing on accounting information as a signification structure which provides a frame of meaning with which to understand all of the different aspects of NPD.

Referring to the *BuildSafe* documentation, he specifically refers to the Stage 4 *Business Analysis* which sets out the anticipated sales volume, sales price, margin return, breakeven and payback for the first five years of the product's life. This analysis is accompanied by a range of back-up schedules including equipment, building and installation costs, together with alternative supplier quotations and capital appraisal calculations, detailed production costs, sales prices including discounts and rebates, distribution and storage costs, marketing costs and detailed sales analyses and projections:

As you can see, the financial part of it pulls all of the various pieces of work of, perhaps, technical people, consultants, marketing, sales people, operations people. All that skill set is brought together in developing a route to market, a product recipe, a process to make it, and all of those people in their own areas are experts in it. So, the sales and marketing people are saying 'we'll sell it at this price', the logistics people are saying 'we'll transport it in this way and at that cost', operations are saying 'well this is how we'll make it — using this type of process, using this bill of materials', so all of that pieces together then. So everybody is sitting there then, it is very simple then, you'll have someone there saying 'my bit is 10, this bit is 20, and this bit is 50 and the selling price is 200' (*Nick, Managing Director, Topwood*).

Here, accounting information is providing a common means of understanding NPD issues. Referring again to the *BuildSafe* documentation, Nick identifies the various ‘payback’ calculations based on alternative supplier options, describing ‘payback’ as a commercially meaningful accounting calculation which effectively communicates what the Steering Committee ‘*would be willing to live with*’.

Given that this information drives the stage-gate decisions, these signification structures are closely intertwined with the legitimation and domination structures that underpin them:

We’ve got to make decisions based on numbers, facts, data.....data-based decisions. So there are two vital areas: we need strong financial information and strong statistical quality information (*Nick, Managing Director, Topwood*).

Again, financial discourse is perceived by Nick as an effective tool with which to convey organisational norms and communicate a set of values governing what should be approved and what should not be approved. These norms and values are reflective of the wishes of the parent company, Magma.

6.5.3 Nick’s external structures

Nick’s only engagement with NPD is at the stage-gate reviews within the formal NPD process, meaning that the formal NPD process emerges as a significant aspect of his structural context. As pointed out in Chapter Five, accounting information within the formal NPD process is relied upon at a relatively late stage, after many of the key design and market decisions have been made. As a result, Nick does not view accounting information as a prevailing language underpinning NPD:

All you need is a set of accounts and a bit of financial analysis to be able to compare apples with apples... the biggest factor with any development project here is not the financial, it’s the technical (*Nick, Managing Director, Topwood*).

Nick accuses the Finance function of lacking enthusiasm for NPD, particularly when contrasted with the proactive attitude of those in other functions:

Everyone is more than happy to let the [NPD] decision be made on a financial basis but I think the accountants look at it as being a pain in the ass... but from the Marketing person's point of view it's par for the course, it's 'we need to create a new product, what can I do about that' (*Nick, Managing Director, Topwood*).

According to Nick's account, neither accounting information nor the Finance function are enabling structures in the context of NPD.

Having examined all of the agents-in-focus in Topwood, clear differences are evident between all three. The Managing Director's (Nick) primary loyalty is to the group. The Head of Finance (Paul) occupies the role of policeman while the Head of Operations (Jack) appears to be quite isolated and frustrated in his ongoing endeavours to develop new products in Topwood. This is because all three are differently situated within the position-practice relations surrounding NPD. The managers are affected by their own internal and external structures and this has implications for each manager's attitude to accounting information. From within his dispositional commitment to the Magma group, Nick draws on accounting information as a signification structure with which he oversees NPD from his position on the Steering Committee. From his corporate position he does not view Finance as a particularly supportive external structure and does not regard accounting information as a prevailing language underpinning NPD. From within his dispositional commitment to innovation and creativity, Jack draws on accounting information as a domination structure which sets out the order of dependency and autonomy within the Magma group. Jack feels constrained by Magma as an external structure and criticises what he considers their over-reliance on accounting information when making NPD decisions at Steering Committee level. From within his dispositional commitment to profitability, Paul draws on accounting information as a legitimation structure underpinning all NPD decisions. However Paul is not successfully balancing the conflicting accounting information requirements of Nick and Jack, despite what he considers to be his best efforts. These issues are discussed in detail throughout Chapter Seven which examines the external structures (7.2), internal structures (7.3),

active agency (7.4) and outcomes (7.5) of structuration which shape the managers' use of accounting information during NPD.

6.6 METBUILD'S HEAD OF OPERATIONS - PETE

Metbuild manufactures a range of Beta products and was acquired by Magma in 2006. A detailed account of Metbuild's products and markets, history and financial performance is presented in Section 5.2.4. Metbuild's products are more specialised than those of Topwood and are aimed at furniture manufacturing and commercial fitting. The plant was constructed in the early 1980s and has undergone significant expansion since then. Since acquiring Metbuild, Magma has invested €17m in new technology and equipment at Metbuild's plant. Metbuild is in the early stages of a major new product development project – *Ebuild*.

Pete joined Metbuild in 1987 after leaving secondary school and worked his way up to his current role as Head of Operations, which he has occupied for the past three years. He is currently studying at night for his engineering degree.

6.6.1 Pete's dispositional frame of meaning

An agent's dispositional frame of meaning, also known as his habitus, refers to those aspects of his world view which shape his attitudes and actions (Stones, 2005). Given Pete's training and career to date, it is reasonable to expect that he would demonstrate a dispositional commitment to engineering and creativity, much like his Topwood counterpart, Jack. Yet, on the contrary, Pete's dispositional frame of meaning is embedded in financial accountability and profitability:

Because business is profit and loss and we all understand that... There would be an ethos, if you like, within Metbuild, it is very much that anything you do you must justify, down to something for this room, you're just programmed that way.... and Finance has to be in there big time (*Pete, Head of Operations, Metbuild*).

Pete refers to everybody in Metbuild as ‘financially literate’, a factor he attributes to a very effective Finance function. He describes an evolved and open Finance function which has a history of working closely ‘*with us lunatics in terms of “process” people*’. This commitment to profitability and financial accountability is evident in the other Metbuild managers:

One thing I think is fair to say about this company is that from the very early days, the amount of information given out financially to the top management, and the next level, was actually quite good... Basically people knew exactly what was going on in the business. People learnt and became very aware of the impact of their decisions. We have that culture here. I mean each month Pete and all of the management team will get a full financial report (*Des, Head of Finance, Metbuild*).

Accounting information is fundamental to what we do throughout NPD (*John, Managing Director, Metbuild*).

Accounting information is clearly an important aspect of everyday routines in Metbuild, and it is through these everyday routines that Pete’s overriding frames of meaning were conditioned and developed:

In manufacturing it always comes down to € per m³.... this has built up over time (*Pete, Head of Operations, Metbuild*).

6.6.2 Pete’s conjuncturally specific internal structures

From within their dispositional frames, agents draw on their conjuncturally specific internal structures. These refer to those aspects of their internal knowledgeability associated with their specific role or task. Pete believes that accounting information provides an organisation-wide interpretive scheme that allows managers from different backgrounds and in different circumstances to make sense of and communicate about NPD issues:

They [consultants] say ‘ye [sic] live your lives on € per m³’. But it makes a whole pile of sense, and for non-finance people it is easy to grasp... accounting information helps us to understand at a very working level what we’re dealing with... (*Pete, Head of Operations, Metbuild*).

Pete's everyday reliance on accounting information is influenced by his knowledge of the expectations of the Steering Committee:

The finance is feeding up into a higher level. In terms of the running of the business it's me and Des here locally, but all of this [financial analysis] is going up to the next level (*Pete, Head of Operations, Metbuild*).

This illustrates how these signification structures are intrinsically linked to the legitimation structures that underpin them. Knowing that the Steering Committee relies on accounting information to sanction NPD projects, Pete is drawing on his internal legitimation structures in order to justify his behaviour. The values and ideals implied in the legitimation structures with which the NPD Team justify their NPD actions to Magma, underpin the signification structures drawn upon by that same NPD Team to understand the implications of their day-to-day NPD decisions.

Accounting information is clearly an important basis of accountability for the Steering Committee, but moreover, the notion of 'who gives account' appears to be an important aspect of that accountability. Pete believes that accounting information is only relied upon by the Steering Committee to make stage-gate decisions when it is presented or delivered by an accountant:

The financial element [of the NPD process document] has to be justified by financial people. We're doing some analyses at the moment [points at the *Ebuild* project document] and the financial analysis has to be done by Des, not by me. Now I can do it, I can do a top-level analysis - this is my justification and my interpretation - but we have to go back to the next NPD meeting with that proposal and we can't move this on unless Des does the financial analysis. (*Pete, Head of Operations, Metbuild*).

In these terms, Pete is describing Des as an 'overseer' who approves the financial information. As well as drawing on accounting information as a legitimation structure with which he must justify his behaviour during NPD, Pete is also drawing on associated domination structures, as he perceives the Finance function is holding jurisdiction over the accounting information, allowing them to exercise power over those who are held accountable on the basis of it. There are mixed views on this throughout the Group, with some sharing Pete's perspective and others disagreeing:

I trust engineers fully but ultimately you need to make sure that this is checked and rigorous (*Simon, Head of MMD*).

It's less about who presents it [accounting information]. That doesn't matter... the reassurance comes from knowing who is on the project team and has the appropriate interaction taken place (*Bill, Chief Executive of Magma*).

This illustrates how internal knowledgeability will vary amongst agents differently situated in relation to given external structures, further justifying the necessity to examine each agent's structuration process at a micro level.

6.6.3 Pete's external structures

Pete identifies the positional identity and associated practices of Metbuild's Finance function as an enabling external structure that supports the NPD Team:

We have very good costing models here. I would say from being a non-finance person it allows us the ability to do 'what if' scenarios. So I can make assumptions on a whole range of issues early on... the system itself is audited and verified by our Finance people and the values are updated every month to make sure that people like us are dealing with the latest costings associated with the business (*Pete, Head of Operations, Metbuild*).

Pete feels empowered by Metbuild's Finance function to such an extent that he is happy to engage with accounting information himself from very early in the NPD process. However, he also describes how accounting information is heavily relied upon by the MMD Steering Committee in the latter stages of the formal NPD process. Again, he refers to the necessity for this accounting information to be prepared and presented to the Steering Committee by a member of the Finance function. In this way, Pete is recognising the role of the Finance function in validating and endorsing accounting information.

Pete also refers to the impact of the parent company, Magma, on NPD. However, unlike his Topwood counterpart, Jack, he is not unduly overpowered by Magma in terms of organisational hierarchy, possibly due to his comfort with accounting information and his positive relationship with the Finance function, as discussed above:

In any corporate set-up you have to make tough decisions... if you had someone in America procrastinating over a decision that would be worse... (*Pete, Head of Operations, Metbuild*).

Pete is also affected by the competitive market:

It is the way business is now, everybody is watching the bottom line at the end of the day all NPD comes down to is 'is there a market?' and 'what's the price?', the market is your volume, the price is the cost and the margin. If they work, you're on a winner (*Pete, Head of Operations, Metbuild*).

The competitive nature of Metbuild's market has influenced and further reinforced Pete's dispositional commitment to profitability and financial accountability.

There are clear contrasts between Pete and the managers in Topwood, not least Pete's counter-part Head of Operations, Jack. Pete is striking in his positive outlook and sense of teamwork, particularly with regard to the Finance function. These contrasts are discussed in detail throughout Chapter Seven, particularly in Section 7.5 which explores contrasts in the modification of structures in Topwood and Metbuild.

6.7 METBUILD'S HEAD OF FINANCE – DES

Des has been Metbuild's Head of Finance for six years. He is a qualified chartered accountant and has been working with the company for twelve years.

6.7.1 Des' dispositional frame of meaning

Des demonstrates a strong dispositional commitment to accountability and a desire for financial scrutiny. He characterises himself as bringing a balancing influence to those individuals who are often very enthusiastic about NPD projects:

Well you've got to bring a scepticism to it... John [Metbuild's Managing Director] will come in and he'll tell you that he's willing to invest his own money in this and so John is at one end of the spectrum saying this thing is a complete runner and he's totally focused and he can't see anything else except this *Ebuild* project and this is the future and he's totally bought into that... It is his energy and his motivation and his, I guess his engineering background, and you need that, but I'd be a bit more sceptical and you sure as Hell need that too (*Des, Head of Finance, Metbuild*).

Des' frame emerges to a large extent from his training and career to date as an accountant but it is supported by similar values and ideals throughout Metbuild:

There would be a strong emphasis on financial control around here... not control more financial understanding... to be honest with you, no matter what we're doing here, even basic stuff, two or three times a week I am having financial conversations with people about costing, choosing between customers and contracts or selecting a supplier, basically very few decisions are made in isolation without some financial input (*Des, Head of Finance, Metbuild*).

This commitment to financial control and profitability is evident in the analyses of other managers in Metbuild (refer to Sections 6.6.1 above and 6.8.1 below). The findings suggest that Des himself contributes to, what appears to be, an organisation-wide set of ideals:

You need what I would call a benign accounting function. Like Des wouldn't be there saying 'you're after blowing 100k trying something that didn't work'. He'd say 'I understand the need to do that'. He's not burying it but he's not shouting about it either... This is a speculative business and they [Finance] have no choice but to be part of the problem as well as part of the cure (*John, Managing Director, Metbuild*).

6.7.2 Des' conjuncturally specific internal structures

Des draws on accounting information as a signification structure that provides interpretive schemes and discursive practices which draw together the wide range of issues pertinent to NPD:

I think it [accounting information] helps people to understand what they're dealing with. It brings a common meaning to decisions.... [it is] trying to ensure that we're all talking the same language and nothing is getting lost in translation (*Des, Head of Finance, Metbuild*).

These interpretive schemes and discursive practices are supported by general frames of meaning embedded in Metbuild's organisation-wide commitment to financial accountability and profitability. In this way, Des' dispositional and conjunctural internal structures are reinforcing and informing each other as well as those internal structures of the other agents-in-focus in Metbuild.

Des' description of accounting information as a language highlights significant differences in the internal structures of managers in Topwood and Metbuild. Des and Pete's dispositional commitment to profitability combined with their conjunctural belief that accounting information provides interpretive schemes and discursive practices which draw together disparate NPD issues mean that accounting information has, over time, become an important day-to-day language throughout the process. This is not evident in Topwood where the managers' internal structures are less aligned. Accounting information provides the words and symbols. How these words and symbols are interpreted depends on the agents' internal structures. This issue is explored in more detail in Chapter Seven (7.2.2).

6.7.3 Des' external structures

Des recognises the parent company, Magma, as an irresistible causal force, bringing with it its own set of position practices and networked relations with which Metbuild must comply:

In the Wyndham days, we were sitting here on the periphery and we were a small fish in a big pond. Now, we're closer to God obviously, it is no longer a case that the States come in at 3pm every evening and you had that 2 or 3 hour window, you just checked your e-mails every morning to see if anything else came in, but you worked away yourself. By and large it was very peripheral stuff, and you had very little interaction with the States... .. (Des, *Head of Finance, Metbuild*).

Magma's proximity to Metbuild in comparison with the previous owner means that they are a more significant presence in Metbuild's day-to-day operations.

Des also refers to significant changes in Metbuild's external environment in recent years:

We [MMD] have spent a long time in that commodity space and if we stay there, we're dead. Construction is over and the Irish market is not going to sustain us going forward. The UK is becoming a very large player and UK companies are very innovative... we have to innovate... we have to keep up... if we continue to back losing horses we're dead (Des, *Head of Finance, Metbuild*).

Des describes the impact this changing external environment has had on all decision-making within Metbuild:

When you're up there and you're making loads of money, you tend to be a little more liberal with your funds and less questioning The reality is the environment out there is a little bit sharper (*Des, Head of Finance, Metbuild*).

6.8 METBUILD'S MANAGING DIRECTOR - JOHN

As outlined in Section 5.2.4.2, Metbuild manufactured its first Beta board in 1983. John, a trained engineer and having worked in construction for several years, joined Metbuild in 1986. He was on Metbuild's first senior management team and has been with the company ever since, during which time the company's production capacity has trebled and its product base has expanded significantly.

6.8.1 John's dispositional frame of meaning

John demonstrates an enduring dispositional commitment to innovation, expansion and growth, but one that is still grounded in financial accountability:

The management team, either collectively, or some individual on it, has to have vision... but you can't lose the run of yourself, this stuff has to make money (*John, Managing Director, Metbuild*).

John's commitment to innovation and growth is shaped by those years in which he, along with others, worked to build Metbuild. His grounding in financial accountability is influenced by the limited resources available at the time to support that growth. This illustrates the relationship between an agent's experience of interacting with their conditions of action and the emergence of their general frame. The longstanding and durable aspects of John's dispositional frame were formed in these early years, during which he was a member of a small management team who were working together to ensure the company's survival:

Some of us came from the construction industry and this was very successful, it was a great training. We had a core group of people with a 'can do' attitude but also with the discipline of knowing the importance of showing how the numbers stack up and providing independent validation of every decision taken... (*John, Managing Director, Metbuild*)

John's dispositional frame of meaning is reflected in his leadership style. Having emerged himself from a period during which a small team worked closely together to build the company, John has continued to have that open and collaborative approach to leadership ensuring clear communication between Magma and Metbuild.

6.8.2 John's conjuncturely specific internal structures

John's role in Metbuild is broad. He is a member of the Steering Committee but he also maintains significant involvement with the NPD Teams. In this sense, John is involved with many different aspects of NPD. In his view, accounting information plays an important role throughout the process but its nature and characteristics change at different stages:

The main thing for NPD is that we get an idea and we develop some early-stage screening and this must be financially-based... and if you think the numbers look ok, you go into more depth... and you bring in more expertise (*John, Managing Director, Metbuild*).

In this way, John draws on accounting information as a critical legitimation structure through which key NPD decisions are made, both by the NPD Team early in the process and by the NPD Steering Committee later in the process. These legitimation structures are intrinsically tied to the signification structures which facilitate them:

People are quite cost-conscious here. And that's because of good financial information. We know the value of our product, we can trot this stuff out. We don't express our energy in KW per tonne, we express it in cost per tonne... (*John, Managing Director, Metbuild*).

John's dispositional frame and conjuncturely knowledge are embedded in his belief that accounting information is a language through which he understands issues of importance in NPD, but this language also effectively communicates the norms and expectations which must be adhered to during NPD decision-making. John's open and collaborative leadership style has resulted in his internal structures influencing those of his networked others, Pete and Des. This is examined in more detail in Chapter Seven (7.2.5).

6.8.3 John's external structures

John believes that high-level accounting information is required from the very inception of a new product idea. As the project progresses and the likelihood of financial commitment increases, the analysis becomes more detailed and requires greater involvement from Finance, finally culminating in the presentation of the new product's *business analysis* by the Head of Finance to the Steering Committee:

For Magma the numbers must stack up... they require validation of every decision taken (*John, Managing Director, Metbuild*).

From John's perspective, accounting information has increased in importance as the competitive market has become more challenging- setting out the challenges facing the company as well as the parameters within which they must operate. The following quote typifies John's use of accounting information in confronting this particular external structure:

We're looking at some opportunities in wood insulation at the moment and the first thing is 'if we were to do it, how much could we do?'... So let's say we could make 10 tonnes an hour, that's 1500 tons a week by 50 weeks a year, which is about 300,000-400,000 m³ and straight away we're asking what would that sell for, what would we make, ok we're looking at potentially €8m a year profit. We need to get to that very rapidly. We need to see if this thing is potentially profitable in the marketplace and we don't want to progress too far before we make those decisions (*John, Managing Director, Metbuild*).

The competitive market is an independent causal influence which John cannot control. He can only control how he responds to it in terms of decision-making within Metbuild. This illustrates how independent causal influences affect change on a micro level.

While clear differences were evident between all three agents-in-focus in Topwood, Metbuilds' agents-in-focus offer a stark contrast in their similarity. The Head of Finance (Des), Head of Operations (Pete) and Managing Director (John) are all differently situated within the position-practice relations surrounding NPD but the commonalities in their internal structures mean that they comprehend and relate to their external structures in similar ways. This is particularly evident in their attitude to accounting information all three of whom view it as an enabling and supportive structure underpinning NPD. In supporting members of the NPD Team on a day-to-

day basis, while still retaining his position as financial gatekeeper of the formal process, Des is successfully balancing the conflicting accounting information requirements of members of the NPD Team and the Steering Committee.

These issues are discussed in detail throughout Chapter Seven but most particularly in Section 7.5 which discusses the outcomes of the structuration process, and provides insights into how the collaboration of internal and external structures shape the managers' use of accounting information during NPD.

6.9 CONCLUSION

The findings presented in Chapter Five demonstrate how managers in different circumstances throughout the group use accounting information in different ways during NPD. In providing a composite research strategy to accompany Structuration Theory, Stones provides the tools with which to conduct a micro-analysis of the structuration process surrounding several managers as they engage with accounting information during NPD. Each micro-analysis involves analysing all of the case data, including interview transcripts, interview notes and documentary evidence, each time using a different manager as the lens of analysis. The six micro analyses presented throughout Chapter Six facilitate an exploration of the extent to which internal knowledgeability varies amongst agents differently situated in relation to external structures.

Clear differences are evident between the three agents-in-focus in Topwood. The Managing Director's (Nick) primary loyalty is to the Magma group. From within his dispositional commitment to the Magma group, Nick draws on accounting information as a signification structure with which he oversees the progress of NPD projects. The Head of Finance (Paul) occupies the role of policeman. From within his dispositional commitment to profitability, Paul draws on accounting information as a legitimation structure with which all NPD decisions must be justified. The Head of Operations (Jack) just wants to create new products. From within his dispositional commitment to innovation and creativity, Jack draws on accounting information as a domination structure which sets out the hierarchical order within the Magma group.

All three managers are affected by their own internal and external structures and this has implications for each manager's attitude to accounting information. Nick demonstrates indifference to accounting information, Jack resents it yet Paul believes it is at the core of every decision. These analyses suggest that Paul is not successfully balancing the conflicting accounting information requirements of Nick and Jack.

Metbuild's Head of Finance (Des), Head of Operations (Pete) and Managing Director (John) are also differently situated within the position-practice relations surrounding NPD but commonalities in their internal structures mean that they react to their external structures in similar ways. This collaboration of internal and external structures manifests itself in their attitude to accounting information, all three of whom view it as an enabling and supportive structure underpinning NPD. Pete feels empowered by Metbuild's Finance function and willingly engages with accounting information throughout NPD while John believes that every NPD decision must be validated financially. Des is simultaneously supporting members of the NPD Team on a day-to-day basis, while still retaining his position as financial gatekeeper of the formal process.

These findings illustrate how an agent's behavior is guided by their phenomenological perspective in combination with their institutionalised structures. This exploration of the combination of agency and structure enhances our understanding of human behavior. For instance, when using accounting information Jack is drawing on internal legitimation structures that are deeply entrenched in associated domination structures which are shaped by his experiences of Magma as an external structure (6.3). Meanwhile when Jack's counterpart in Metbuild, Pete, uses accounting information he draws on internal signification structures which reinforce his dispositional commitment to financial accountability and profitability developed through his ongoing interaction with an enabling and supportive Finance function (6.6). Jack and Pete's internal structures do not exist in a vacuum. They are shaped and modified through interaction with external structures. It is this interaction which determines their behavior. External structures are also subject to modification, or at least an agent's perceptions of those external structures are subject to modification through ongoing interaction with their internal structures. The next chapter discusses

these findings, particularly the evolutionary nature of internal and external structures, in more depth.

Chapter Seven

Discussion of Findings

7.1 INTRODUCTION

Chapter Five presented the study's organisational context, describing MMD's NPD process and the use of accounting information in that process. In order to develop a better understanding of this use of accounting information, Chapter Six presented an analysis of six individual managers' perceptions of the role of accounting information in NPD. This analysis was produced as a result of applying Stones' (2005) composite research strategy. It is now possible to frame MMD's NPD environment in Structuration Theory, thereby allowing an examination of the detailed nature of the structures, both internal and external, that shape managers' use of accounting information during NPD.

Section 7.2 discusses the external structures and networks in relation to the position practices that frame the action horizons of the agents-in-focus. Section 7.3 examines the agents' internal structures. Section 7.3.1 focuses on their generalised views and dispositions and Section 7.3.2 explores their knowledge of the interpretative schemes, rules and norms associated with their particular roles in NPD. Shifting the focus of structuration from manager to manager, as presented in Chapter Six allows the study to examine how each agent internally responds to their external environment as well as to explore the similarities and contrasts between agents in Topwood and those in Metbuild. Section 7.4 discusses those dynamic moments in structuration when agents draw on their internal structures and apply their understandings and knowledge to their structural context in order to act.

Section 7.5 focuses on the outcomes of structuration in Topwood and Metbuild. Outcomes can take the form of structures or events. Outcomes as structures will result in the modification or preservation of structures, both internal and external. This examination of outcomes as structures recognises the cyclical nature of structuration. It allows an exploration of the reasons why some structures are reproduced over time and the circumstances under which they might change. Outcomes as events are those outcomes of social interaction outside of modifications to internal and external structures. This includes anything from the decision to 'park' a new product project to the decentralisation of accounting information.

The in depth insights of this study are most prevalent in the discussions surrounding the outcomes of structuration. The objective of this chapter is to enhance our understanding of how managers use accounting information during NPD and in doing so to develop some insight into why managers behave in the way that they do. As discussed in Chapter Four, Stones' quadripartite cycle of structuration facilitates empirical analysis at the level of ontology-in-situ, allowing a depth of insight into the managers' conduct. The managers' conduct, i.e. their use of accounting information during NPD, is encapsulated within active agency. Active agency is that moment when a manager's internal and external structures combine and are manifested through his action. However, to focus on active agency examines only that dynamic moment when managers act. This is like looking at a snapshot of a particular moment, it will not reveal any insight into how those internal and external structures came about or were affected by each other and it is that insight which enlightens us as to why managers behave in the way that they do. The duality of structure is based on the concept that structures are both the medium and outcome of social interaction. In this way internal and external structures are the medium of an agent's conduct, but internal and external structural outcomes constitute the internal and external structures at the next round of structuration. This means that depth of insight into a manager's conduct, that is depth of insight into the internal and external structures which are the medium of that conduct, is really gained by examining these internal and external structures as structural outcomes.

7.2 EXTERNAL STRUCTURES

As described in Chapter Two, Structuration Theory encompasses both deterministic and voluntaristic elements as it recognises the influence of both situational and voluntary factors in accounting for the activities of individuals. As a result, an analysis of data using Structuration Theory requires the researcher to adopt a process of methodological bracketing. In one bracket, the agent's context is analysed, exploring the terrain the agent faces and facilitating an examination of how their interaction with that terrain is implicated in the agent's internal structures. In the alternative, an analysis is carried out of the agent's conduct, exploring those internal structures and contributing to a better understanding of the agent himself. In order to

understand an agent's internal structures, it is first necessary to understand the external structures which those internal structures purport to grasp.

The nature of external structures is one of the most debated aspects of Structuration Theory. As set out in Chapter two, Giddens' original conception of Structuration Theory, in exploring the duality of structure, recognised the existence of external structures but did not actually deal with them to any great extent, focusing instead on the agent's internal knowledge of those structures. Giddens' critics, specifically Archer (1995), focused on the 'objective existence' of external structures but this only resulted in the separation of external structures from the agents who inhabit them. Stones (2005) pays particular attention to the degree of autonomy inherent in external structures, believing there to be two types: independent causal influences, over which the agent has no control, and irresistible causal forces which the agent may have a degree of control over depending on their hermeneutic frame.

This section discusses the external structures and associated position practices identified in the strong structuration analyses of the agents-in-focus presented in Chapter Six. The NPD process comprises the formally documented set of routine practices governing NPD (7.2.1). Accounting information provides its own system of recognisable procedures and patterns of behaviour, which can encompass accounting information in the context of the formal process as well as accounting information used informally throughout NPD (7.2.2). In addition to accounting information, there are also the recognisable procedures and patterns of behaviour associated with other information structures, the most significant of which is sales and marketing information (7.2.3). The social identities and position practice relations of each company's Finance function form a significant element of the agents' structural context (7.2.4) as do Topwood's Managing Director, Nick, and Metbuild's Managing Director, John, each of whom provides a critical link between Magma and their respective companies (7.2.5). These structures have a value-dependant influence over the managers' behaviour. While they are external to these agents, they are wrapped up in each agent's desires, dispositions and ordering of concerns (2.4.2). The findings also provide evidence of the authoritative and controlling impact of the parent company, Magma (7.2.6), as well as more societal-level factors in the external

environment, such as competitive market forces and foreign exchange fluctuations (7.2.7).

7.2.1 The NPD process

The NPD Steering Committee make their stage-gate decisions based on the information contained in the formal NPD process document. As described in Sections 5.4 and 5.5, some accounting information is reviewed in the early stages but it is most prominent during the *Business Analysis* phase when the Finance function presents the Steering Committee with a comprehensive business case for the proposed new product. This includes five-year forecasted sales volumes, sales prices, margins, returns and breakevens as well as analyses of planned equipment spend, building and installation costs, production costs, distribution and storage costs and advertising and promotion costs. Accounting is used in this context at a relatively late stage in NPD, immediately before any significant commitment of financial resources to the project. The Steering Committee relies on this accounting information to justify capital expenditure and control Magma's investment funds. In this formal capacity, accounting information is not shaping new products and influencing design, those decisions have already been made based on information supplied through other information structures. The accounting analyses which take place late in the process assess the project against prescribed financial criteria. These analyses are driving stage-gate decisions, but these decisions are about controlling the company's resources and monitoring investment as opposed to product design. This illustrates that, within the formal NPD process, accounting information is relied on for the more traditional purpose of monitoring and score-keeping. This is corroborated by Magma's Chief Executive, Bill, who describes accounting information as having a stewardship function first and foremost (6.4.3) and MMD's Sales and Marketing Director, Alex, who compares the accountant's role in NPD to that of a 'referee' (6.4.1).

The formal NPD process and the accounting information therein provide senior management, particularly at corporate level, with a system of routines from which they draw ontological security with regard to NPD projects. The fact that they will not commit financially to a project without a clear financial case means that, ultimately, accounting information is a key source of that ontological security. In addition, the Steering Committee are believed to attribute greater credibility to accounting information when it is presented by an accountant (6.6.2). In this way, the social identities of members of the Finance function and the position practice relations associated with them, reduces the Steering Committee's uncertainty about the stage-gate decision and further enhances their ontological security.

The corollary of this is that the NPD Team also relies on accounting information during the formal NPD process as an important tool with which to persuade Magma to support NPD projects. The respective Heads of Operations in Topwood and Metbuild deal with accounting information in this context in quite different ways. Jack (Topwood) resents it, finding it restrictive and constraining like the NPD process itself. Pete (Metbuild) accepts it as a normal part of the process. The contrasting reactions of Jack and Pete to their external structures is a recurring theme throughout this discussion and is explored in the context of the outcomes of structuration in Section 7.5.2.

7.2.2 Accounting information

As set out in Chapter Four, the managers in this study were not provided with a detailed definition of accounting information. To impose a very prescriptive meaning to the term at the outset of the study might have influenced their responses and narrowed the findings. Instead, managers were asked to regard as relevant any piece of information they considered necessary and appropriate to a financial analysis during NPD.

The managers identified two distinct types of accounting information. They immediately referred to the accounting information in the context of the formal NPD process which, as described in the previous section, is primarily relied upon by the

NPD Steering Committee to approve the project at the various stage-gates. However, accounting information is not limited to the formal process. The findings provide evidence of it being used on an informal basis by members of the NPD Team at an earlier stage in NPD to inform decisions regarding product feasibility and design.

The relative emphasis placed on these two uses of accounting information changes depending on the stage of the NPD process. Accounting information is most heavily relied upon in a formal context toward the latter stages of the process. However, the informal use of accounting information by the NPD Team occurs at a much earlier stage, often before the formal process has even begun. The nature and content of the accounting information used informally was found to differ from that used in the formal NPD process. As set out in Sections 5.4 and 5.5, the Steering Committee review detailed schedules of finalised forecasted sales and costs accompanied by financial measures such as ROI. Accounting information reviewed in an informal context is less formulaic and process driven. It is more of a language or given understanding. It is not structured or aggregated in any consistent, recognisable format. Rather, it is carried out as needed and it is more intuitive in nature. As a result informal accounting information can manifest quite differently in different circumstances. For instance, Metbuild's Head of Operations suggests that such accounting analyses might often be performed at lunch on a copy of the newspaper. In this context it is not readily identified as accounting information but is considered part of the general discussion of the project. However, informal accounting information can also be quite sophisticated, as reflected in the analysis of capital expenditure options in stage four of the *EBuild* project (Refer to Table 5.12 in Section 5.5.1). What marks accounting information as informal is the fact that it is improvised and therefore varies from project to project.

It emerges from this analysis that accounting information, at its basic level, consists of basic stocks of data comprising accepted conventions and codes which are largely familiar to everyone within the organisation. Identifiable concepts framed in accounting terms such as revenue, cost, profit, loss, return and investment are themselves external structures drawn upon by individuals every day, whether in a business context or not. How an individual engages with these external structures, whether in a formal or informal context, depends on that individual's internal

structures. These might include their dispositional attitude to accounting resulting from their educational background or their conjunctural relationship with accounting resulting from their role in the organisation. This illustrates how elements of both determinism and voluntarism are critical in understanding how managers use accounting information during NPD. These interactions and how they lead to either the modification or the preservation of external structures of accounting information are explored in the outcomes section of this chapter in Section 7.5.1.2.

7.2.3 Other information structures

Other information structures emerged throughout the case. These were not a focus of the study and so were not examined in detail but it is important to acknowledge them and to note how managers' perceptions of these other structures compare with their perceptions of accounting information.

As described in Section 5.5, as the formal NPD process has evolved, marketing information has moved upstream and has become increasingly relied upon in the earlier stages of the process:

First and foremost [in relation to the proposed new product] you need an early analysis of the marketplace. It does not really matter what it is going to cost at that stage. What you need is an early analysis of demand (*Simon, Head of MMD*).

The findings indicate that marketing information is the prevailing form of discourse at the outset of NPD, perhaps serving as a more enabling and supportive external structure than accounting information at these early fluid stages.

As the project progresses from a concept to a product, marketing information is replaced by technical information as the prevailing language:

[Pointing to back-up schedules for *BuildSafe* containing prototype testing results] If you didn't have all of this technical information, the process would grind to a halt (*Nick, Managing Director, Topwood*).

In the revised NPD process, the most technically oriented of all of the stages, the *Prototype Development and Testing* stage, is carried out before any formal analysis of accounting information. This suggests that, in a formal context at least, both

marketing and technical information are considered more critical to the actual development of new products than accounting information. In a formal context, accounting information is not shaping new product design and development but it is taking those decisions already made based on marketing and technical information and assessing them against prescribed financial criteria.

It is clear from Section 7.2.2, however, that accounting information is also used on an informal basis by some managers at earlier stages in the process. This non-routine, non-structured accounting information is prepared largely by NPD Team members themselves as and when they need it, suggesting that it in some way supplements the marketing and technical information that informs decision making at these early stages:

It [accounting information] is not so much a devoted input at the outset but it is tied into the commercial considerations, the production and the sales considerations.... If you are going to go with it [the new product] then you're going to bring in Finance ... they would all kick in at a later stage (*Paul, Head of Finance, Topwood*).

7.2.4 The Finance function

In exploring the role of accounting information in NPD, the Finance function emerges as an external structure. Their involvement is most visible within the formal NPD process. At the *Business Analysis* stage-gate the Head of Finance for each company presents the accounting element of the business case for the proposed new product (5.4). This immediately precedes any significant commitment of the Group's financial resources to the project. As the process has evolved, this stage, and consequently the role of Finance in the formal process, has moved downstream (5.5). As outlined in Section 6.6.2, Metbuild's Head of Operations is adamant that accounting information must be presented to the Steering Committee by the Finance function as it adds greater legitimacy to the information and is perceived by the Steering Committee to be more reliable:

... it will not be accepted... no it'll have to be him [the Head of Finance]. Because even if I came up with the same numbers it still won't be...., they're [the Steering Committee] not going to, I won't say trust, but they are obviously going to give a higher level of credibility (*Pete, Head of Operations, Metbuild*).

Pete's perspective is shared by members of the Steering Committee:

You want something that's been blessed... I would certainly be looking for reassurance that either Des or Paul has tested this... (*Simon, Head of MMD*).

As discussed in Section 7.2.1, this illustrates how the Steering Committee draw on the social identities and position practice relations of the Finance function to enhance their sense of ontological security about the project. This ontological security is being sought at a later stage as the process has evolved but the Finance function is still the ultimate gatekeeper of NPD investment.

These findings provide significant insight into the role of the Finance function in NPD and also have wider implications for the role of the Finance function generally. Despite the decentralisation of accounting information and the empowerment of employees with financial know-how, both of which are evident in these findings and particularly in Metbuild, the Finance function still retains a significant stewardship and control role.

The involvement of the Finance function in the informal use of accounting information during NPD is less straightforward. Topwood's Managing Director, Nick, suggests that accountants have difficulty preparing meaningful financial analyses at the early 'fuzzy' stages of NPD:

There's a constant requirement for new stuff. So if someone comes along with a NPD idea here from Sales and Marketing, they will say 'can't Accounts help me figure out my pricing and whether I have a margin' and Production will say 'well we'll run it through the process as normal, it might take a bit more of this or that, can't accounts factor that in...', and Accounts then say 'well hold on a minute guys, when you really know what you're doing come back to me' (*Nick, Managing Director, Metbuild*).

Topwood's Head of Operations, Jack, expresses a strong desire for a dedicated accountant to be assigned to an NPD project from the very beginning to assist the Team in developing the idea and persuading Magma to invest in it (6.3.1). This would suggest that the Finance function's difficulties or reluctance in dealing with the earlier, more fluid stages of NPD are limiting the role of accounting information in the earlier stages of the process.

In contrast, Metbuild's Head of Operations (6.6.3) and Managing Director (6.8.3) describe the Finance function as providing an essential contribution to the NPD process from the outset. Both describe Des' (Metbuild's Head of Finance) involvement in NPD projects often before the formal process has commenced. Des has been particularly involved with the *EBuild* development (5.5.1) and states that he has been more involved in the early stages of this process than he has been in prior projects.

Topwood's and Metbuild's respective Heads of Finance, Paul and Des, must balance the conflicting accounting information demands of the various elements in their external environment. The Steering Committee requires accounting information that allows them to monitor progress and make stage-gate decisions. This is structured accounting information, aggregated in a consistent format, which is presented to the Steering Committee at predetermined stages toward the end of the formal NPD process. The NPD Team requires support in preparing accounting information which shapes plans and influences designs. It is not aggregated in any recognisable format and is more intuitive in nature. The findings indicate that Des is the more successful of the two in balancing these conflicting demands and that he has, consciously or unconsciously, cultivated an enhanced role for himself in NPD by providing strong support to the NPD Team in their preparation of accounting information at earlier stages of the process.

Differences in the Finance functions of both companies and how these differences emerged through the process of structuration are examined in more detail in Section 7.5.1.3.

7.2.5 The Managing Directors as agents-in-context

Structuration is occurring in many different places at the same time with agents differently situated within a given conjuncture (4.10.1). The composite strategy put forward by Stones (2005) encourages the researcher to shift the focus of structuration from agent to agent, facilitating the development of a type of conceptual map which recognises the web-like nature of interdependencies within and between the multiple

processes of structuration (Stones, 2005, p. 126). The structuration analyses presented in Chapter Six illustrate these interdependencies, in particular, how any one agent can be treated as both first and third person, depending on whom the analysis is being focused on at a given time. In other words, when the focus of analysis is taken off a particular manager, that manager becomes an agent-in-context of the next agent-in-focus. By contributing to the structural context of action of an agent-in-focus, these agents-in-context are themselves key external structures for that agent-in-focus.

This is evident throughout the study but particularly in the case of the companies' Managing Directors, each of whom forms a significant element of the structural context of the other managers in their companies.

First it is necessary to recap on the strong structuration analyses of Topwood's Managing Director, Nick, and Metbuild's Managing Director, John. These analyses present two Managing Directors with very different backgrounds and very different attitudes to accounting information in NPD.

Nick joined Topwood as a college graduate and worked his way up to his current role four years ago. He is deeply committed to the Magma Group. As a member of the NPD Steering Committee, he uses the accounting information within the formal NPD process to draw together various aspects of a project in order to make an assessment of a project's progress. From within Nick's dispositional commitment to the Magma Group's strategic progress, he draws on accounting information as a signification structure that provides a frame of meaning with which to understand disparate NPD issues. In this way, formal accounting information serves as an important communication device between Nick and the NPD Team. However, Nick does not recognise accounting information as a tool which drives his decisions:

It [accounting information] won't stop the process. One way or another if you had no Finance the process could still continue. And that's reality (*Nick, Managing Director, Topwood*).

John, Metbuild's Managing Director, also sits on the Steering Committee but he engages with Metbuild's NPD Team at a local level far more than his Topwood counterpart. John has been a member of Metbuild since 1986 when he and five colleagues, including a representative from Finance, developed the company from a small operation. He was heavily involved with Magma's acquisition of Metbuild in 2002. John's dispositional frame was formed during his long history with Metbuild and, as a result, he is deeply committed to Metbuild. From his perspective accounting information provides a set of organisational norms, values and standards which legitimate NPD activities. In this context, accounting information is used informally to make NPD decisions within the NPD Team. As part of the formal NPD process, it communicates a norm or benchmark against which the legitimacy of NPD decisions is assessed, providing a facility through which Magma monitor and control Metbuild's NPD activities. In contrast to Nick, John believes that all NPD decisions, from the very outset, must follow the financial analysis:

It was the case back then [in 1986] and it is the case now, the decisions follow the financial analysis - no ifs or buts... accounting information is the ultimate driver of whether it's a runner or not (*John, Managing Director, Metbuild*).

The analyses of Nick's and John's processes of structuration, presented in Sections 6.5 and 6.8 respectively, demonstrate how their micro-level lived experiences have shaped their perspectives but it is important to observe how the attitudes of Nick and John affect their networked others. Giddens' original Structuration Theory has been criticised for over-emphasising the individual nature of action. Stones (2005) conceptualises the agent-in-focus as always being in the midst of and caught up in the flow of position practices and their relations. The findings of this study illustrate this by presenting NPD as a complex social action involving a wide range of actors and clusters of actors with intersecting and overlapping internal and external structures. The analyses of Nick and John, presented in Sections 6.5 and 6.8 respectively, demonstrate how their lived experiences are implicated in each of their perceptions of the role of accounting information in NPD. However, when one widens the lens of Nick's and John's structuration analyses, their internal and external structures overlap with those of other agents-in-focus. In other words, not only does Nick's and John's contrasting phenomenology affect how they use accounting information in NPD, but their behaviour also goes on to influence the culture within each company, which

informs the dispositional frames of other agents-in-focus. This is explored in more detail in Section 7.5.2.3 which discusses the outcomes of structuration.

7.2.6 The parent company

Despite his apparent preoccupation with internal structures, Giddens does explore external structures to some extent. He conceptualised them primarily as constraints, specifically, those constraints which place ‘limits upon the range of options open to an actor’ (Giddens, 1984, p. 59). Stones takes a broader view and suggests that external structures can be ‘enabling as well as constraining’ (Stones, 2005, p. 109) although, ultimately, he too discusses external structures largely in terms of demands, pressures and constraints (Stones, 2005, p. 115). The parent company, Magma, emerges in these findings as an external structure that appears to limit the freedom of the agents to act. Metbuild’s takeover by Magma is more recent than that of Topwood so Metbuild’s managers offered more insight into the impact of Magma as a whole:

Look, things are a little different with Magma, lots of meetings, conference calls, lots of work around managing the Board, forecasting etc... In the Wyndham days you never heard about the Board meeting, here it is Board, Board, Board. In some respects there is a lot of pandering to the Board... (*Des, Head of Finance, Metbuild*).

Magma’s takeover brought with it a set of position practices through which they are perceived as monitoring the company’s activities more than the previous owners:

At the beginning we were far away from ‘Mother’ and we had the freedom to do anything... Now if I say we’re going to dedicate a part of our manufacturing capability next Thursday to R&D they will say ‘hold on a minute what will that do to our bottom line...’ but you just deal with that (*John, Managing Director, Metbuild*).

Despite this increased awareness of Magma’s presence, Metbuild’s managers do not appear to be overpowered by their parent company:

It would be wrong to say that it [Magma] is a big unwieldy machine...we challenge each other sure, but that’s all part of it (*Pete, Head of Operations, Metbuild*).

Each company has had a different journey with Magma. As detailed in Chapter Five, Metbuild was acquired in 2006. It boasts a state-of-the-art plant, facilitated by a €17m investment by Magma as recently as 2008. It has a diversified product portfolio and is viewed as an innovator within the European Beta market, having recently entered a joint development agreement in relation to a €50m NPD project described in the industry as a significant innovative development in Beta manufacture. In contrast, Magma acquired ultimate ownership of Topwood in 2002. Topwood has an ageing plant, has received little investment from Magma since its acquisition and produces relatively low-grade commodity products. It could be construed that Magma has proactively supported Metbuild and developed its plant but has not given the same support to Topwood:

Topwood has been a problem child in that it has had a more difficult run... The plant is clapped out... well not clapped out but it's older relative to the competition (*Bill, Chief Executive of Magma*).

The difference in the relationships that Metbuild and Topwood have with Magma is reflected in the contrasting attitudes of each company's Head of Operations:

Oh gee, Magma is like, you know, walking around with a ton of weight on your shoulders. That's what it's like (*Jack, Head of Operations, Topwood*).

It's not like Magma can [kill] projects. People have a fair idea. There are no surprises. People know themselves. They know about products and pricing, and they know what markets are at, they have a good idea how everything will fare out (*Pete, Head of Operations, Metbuild*).

Given the different experiences that Jack and Pete have had with Magma, it is not surprising that there are such contrasts in their attitudes to their parent company. However, these findings demonstrate how their contrasting experiences of Magma may be associated with contrasts in how they use accounting information during NPD. Jack's and Pete's differing experiences with Magma as an external structure have shaped their differing dispositional frames of meaning, from which they draw on different conjuncturally specific internal structures. This is explored further in the examination of the agents' internal structures in Section 7.3 and in the context of the outcomes of structuration in Section 7.5.2.

7.2.7 The external environment

Stones refers to the need to locate a more detailed structuration study within broad historical and social trends and parameters, if only to establish some key points of connection between these trends and parameters and identify the specific aspects of the dualities of structure under review (3.5).

The most significant societal factor influencing this study is referred to by the Heads of Finance in Topwood (6.4.3) and Metbuild (6.7.3). Both refer to the challenges presented by each company's respective competitive market, in particular, the impact of the collapse of the construction sector. Related to this are concerns surrounding foreign currency markets:

A lot of our ills here would be cured in the morning if sterling got back above 80p. Now at some point it will turn but at the moment it's not turning soon enough for us and then what'll happen is once the economies of the world start picking up and showing signs of coming out of recession energy costs and everything else will start escalating again... and we can't control any of that, we just have to have the capability to deal with it (*Des, Head of Finance, Metbuild*).

Both Heads of Finance suggest that the use of accounting information increases as competitive pressures increase:

There's always that sense in a recession that the accountant has his day (*Paul, Head of Finance, Topwood*).

This provides another example of managers drawing ontological security from accounting information. As the external environment becomes more unpredictable, accounting information is relied upon to enhance the managers' sense of certainty about the outcome of their decisions.

7.2.8 Summary of external structures

The central tenet of Structuration Theory is the notion of the duality of structure, that is, that structures are both the medium and the outcome of social interaction. This is built on the premise that structure and agency are not independent conflicting concepts but are in fact a mutually interacting duality (4.4.5). This is evident throughout Section 7.2, which identifies the key aspects of the structural context of action of the agents-in-focus.

The NPD process is relatively fixed. It is subject to change in the long term, as illustrated in Section 5.5, but, on a day-to-day basis, the NPD process imposes a clearly defined structure on NPD. This structure consists of a formal process, consisting of several stages, during each of which more information is gathered in order to reduce uncertainty surrounding particular aspects of the project. Each stage is separated by a stage-gate at which the Steering Committee decide, based on the information contained within the formal NPD process document, whether or not to proceed with the project. Some accounting information is reviewed by the Steering Committee at the earlier stages but it is most prominent later in the process in the Business Analysis stage, when the Steering Committee assesses the project against prescribed financial criteria with a view to maximising investment of the company's resources. In this context, accounting information is relied upon primarily for its traditional purpose of monitoring and scorekeeping (7.2.1).

Accounting information is also used in an informal capacity throughout NPD. In this context accounting information is less prescriptive and process driven. It is prepared on an improvised basis, often by members of the NPD Team themselves, to inform decisions regarding product feasibility and design from the early stages of the process. Accounting information in a formal context is tied to the NPD process. It is largely homogenous from project to project and, as stated above, it is primarily relied upon for scorekeeping purposes. Accounting information in an informal context is more autonomous, being wrapped up in the agent's internal structures and constantly evolving in order to meet managers' needs. Accounting information itself provides a basic stock of data and recognisable conventions and codes which are familiar to most people, albeit to varying degrees. In a clear illustration of the co-existence of both

determinism and voluntarism in social interaction, how an individual engages with these stocks of data and conventions and codes depends on their internal structures and their dispositional attitude to accounting may result from their educational background or their conjunctural relationship with accounting, which results from their role in the organisation (7.2.2).

The findings also provide evidence of other important information structures such as marketing information and technical information. The relationship between external structures of accounting information and these other information structures emerges as an interesting issue. From the perspective of the NPD Team, accounting information in an informal context supplements the marketing and technical information used in the earlier stages of the process when product design is still fluid. Accounting information is used in a formal context later in the process by the Steering Committee to assess the project against prescribed financial criteria, in a sense financially validating the decisions made earlier in the process (7.2.3).

The role of the Finance function in NPD is most visible within the formal NPD process where its members are relied upon by the Steering Committee to add legitimacy and credibility to the financial analyses. As the project has evolved, this involvement has moved further downstream. In an informal context, Finance provides more of a support function to the NPD Team members who are happy to engage with external structures of accounting information themselves. However, the findings indicate that this is taking place to much better effect in Metbuild than in Topwood, suggesting that Metbuild's Head of Finance is more successfully balancing the conflicting roles of supporting both the Steering Committee and the NPD Team (7.2.4).

The Managing Directors of each company provide the central link between the NPD Team and the Steering Committee. Their contrasting dispositions and perspectives are overlapping with those of their agents-in-context, all of which influence the overall culture in each company (7.2.5).

The parent company, Magma, provides one of the most overpowering external structures evident in the findings. Each company has had a very different journey with Magma and this has had a clear impact on the attitudes and perspectives of the managers, which influence their use of accounting information during NPD (7.2.6).

The careful analysis of the relationships between each of these agent's social structures and their hermeneutic frames captures detailed aspects of the agents' contexts and conduct. The study also identifies connections between these detailed aspects of structuration and broader social trends such as the collapse of the construction sector and fluctuating exchange rates (7.2.7).

Stones' (2005) distinction between independent and irresistible external structures was helpful in recognising that there are varying degrees of autonomy inherent in external structures. However, the findings above suggest that issues regarding the autonomy of external structures are more complex again. They indicate that there is not a clear distinction between external structures which are either independent or irresistible. Rather, the degree of autonomy within these external structures varies from agent to agent and at different times throughout the NPD process. This is an important aspect of the findings and will be discussed in more detail in the Outcomes section of the discussion in Section 7.5.1.2.

7.3 INTERNAL STRUCTURES

Internal structures are those aspects of an agent himself that influence his behaviour. Giddens describes them as the agent's internal knowledgeability of his social structures (3.2.1). An examination of an agent's internal structures is really an attempt to identify the voluntary²⁶ factors implicated in the activities of individuals. This is complex because it involves labelling something which is entirely subjective to every agent. Stones' terminology is helpful in this regard. In distinguishing between

²⁶ Structuration Theory adopts an intermediate standpoint between determinism and voluntarism in recognising the influence of both situational and voluntary factors in accounting for the activities of agents. Voluntary, in this context, means those internal structures which are subjective to the agent, although it is debatable as to whether internal structures are entirely voluntary. Some internal structures become embedded in the agent and therefore lead to habitual behaviour. This behaviour, however habitual, still requires some action on the part of the agent which, to a certain extent, could still be considered voluntary.

dispositional frames of meaning and conjuncturally specific internal structures, he provides a framework which seeks to capture all aspects of an agent's internal knowledgeability. The agent's dispositional frame captures those skills, tastes and ways of acting which are acquired through the activities and experiences of everyday life. These structures are generalisable and transposable, and are drawn upon by that agent across various situations and circumstances. An agent's conjuncturally specific internal structures are linked to the circumstances of their action. They are specific to a given time, place and role or task and, while they are perceived and made sense of on the basis of an agent's general dispositional frame, they are analytically distinguishable from those more transposable structures (3.4.3).

The structuration analyses presented in Chapter Six provide insights into the general dispositional frames of meaning and the conjuncturally specific internal structures of the study's six agents-in-focus. A general discussion of these insights is presented in Sections 7.3.1 and 7.3.2 respectively, although the most compelling aspects of these internal structures become evident in Section 7.5 which explores how they collaborate with each other and with the various external structures, leading to the outcomes of structuration.

7.3.1 Dispositional frames of meaning

Topwood's Head of Operations, Jack, through his education and training as an engineer and his prior experience working in an R&D environment, has developed a strong dispositional commitment to innovation and NPD. This is evident throughout his interview. Regardless of what he is asked, Jack begins almost every answer by re-affirming the importance of NPD. His colleagues in Topwood and in MMD also refer to Jack's single-minded desire to innovate and create new products (6.3.1).

Topwood's Head of Finance, Paul, a qualified accountant, demonstrates a habitual draw towards the routine and structure associated with accounting practices. He understands the need to innovate and appreciates that, at the early stages of a product's development, the team must have the scope to generate and develop ideas at which stage they look to sales and marketing information. However, once the idea is developed, accounting information automatically communicates a defined list of

criteria and, unless those criteria are satisfied, in Paul's words, the project is 'going nowhere' (6.4.1).

The dispositional frame of Topwood's Managing Director was difficult to decipher from his brief responses. However, his generalised views and cultural schema appear to be particularly embedded in the Magma Group's overall strategy. He is less concerned with the process of developing new products and more interested in the outcome of that process and in ensuring that Topwood develop products which adhere to Magma's overall strategy, that is to develop higher value commercially viable products (6.5.1).

Metbuild's Head of Operations, Pete, is a trained engineer who has worked in R&D for many years. He expresses a clear desire to innovate and create new products but this is tempered by a strong dispositional commitment to financial accountability and profitability, which is evident in the language he uses as well as in his overall attitude to NPD. Pete considers the financial implications of the project from the very outset and suggests that business is quite simply about profit and loss before it is about anything else (6.6.1).

Des, Metbuild's Head of Finance, draws on a similar dispositional frame to his colleague Pete. Des and Pete work in different functional areas and have different educational backgrounds, yet both are influenced by the same commitment to financial accountability and profitability causing them to share certain elements of their dispositional frames (6.7.1). The costing models described by Pete in Section 6.6.3 provide an example of some of the common generalised stocks of knowledge drawn upon by both Des and Pete when challenging and testing new products:

There's a robust enough modelling system within Metbuild now, it sets out a nice structured approach, they can nearly handle a lot of this stuff themselves (*Des, Head of Finance, Metbuild*).

There is a sense that Des himself contributes to, and facilitates, Metbuild's organisation-wide values and ideals by demonstrating a sound understanding of the wider business and, consequently, providing a strong link between the Finance function and the rest of the business:

You won't see me getting involved in the optimum mix for making whatever product it is but ultimately it all comes down the line into the accounts so it can't take forever for me to run up to speed on it (*Des, Head of Finance, Metbuild*).

Des has a hell of a lot of experience in this industry. He can very quickly take a look and tell us 'well you need to come back with X, Y and Z' (*Pete, Head of Operations, Metbuild*).

John, the Managing Director, having been involved in the initial set-up of the company almost twenty years ago, is strongly oriented toward strategic expansion and growth but this is still grounded in financial accountability (6.8.1). As described in Section 7.2.5, John believes that accounting information is the taken-for-granted mode of discourse underlying all business decisions, but particularly NPD decisions.

It is reasonable to expect that a manager's deeply embedded frameworks of signification, associative connotations of discourse, habits of speech and overall methods of adapting generalised knowledge to particular practices and circumstances will be influenced by that manager's functional orientation. The findings suggest that this is the case in Topwood. However, all three managers in Metbuild, regardless of their functional orientation, share a common commitment to profitability and financial accountability. This is evident in the language they use as well as the fact that much of their informal dialogue during NPD is framed in accounting.

Topwood's Head of Operations, Jack, is an engineer and wants to build things, as does Metbuild's Head of Operations, Pete, though Pete is more mindful of the financial implications of his NPD activities and this has become embedded in his dispositional frame. Both Heads of Finance are understandably oriented toward the structure and routine associated with accounting, though the evidence suggests that Des' perspective is shaped by the wider business to a greater extent than his Topwood counterpart, Paul. The Managing Directors in each company examine everything from the perspective of its strategic merit and, in this way, both demonstrate an awareness of the 'big picture' to a greater extent than their colleagues do, although, once again,

Metbuild's Managing Director, John, believes that accounting information underpins every decision.

In Topwood, the agents' dispositional frames of meaning are more closely aligned with their individual functions and educational backgrounds, while Metbuild's managers demonstrate an overriding commitment to profitability and financial accountability. It is possible that Metbuild's managers, through their use of accounting information during informal dialogue, have modified their dispositional schema so that they are more reflective of accounting-related issues, while Topwood's managers have not modified their schema to the same extent.

As set out in Section 3.5, there is evidence in the literature of a relationship between agents' experience of interacting with their conditions of action and the emergence of their dispositional frame. Consistent evidence in this study suggests that a range of external structures making up the agents' conditions of actions may be associated with their varying dispositional frames of meaning. These issues are explored further in Section 7.5.2.

7.3.2 Conjuncturally specific internal structures

Conjuncturally specific internal structures refer to the situated agent's own sense of the rules and norms associated with a particular role or task. They comprise the three Giddensian structures, these are: knowledge of the interpretive schemes (signification structures); power capacities (domination structures); and normative expectations (legitimation structures) of the agent-in-focus, as well as his perceptions of the external terrain and his 'networked others'. Stones works toward bridging the theoretical gap between internal and external structures by recognising that the conjuncturally specific internal structures of an agent-in-focus are constantly interacting with a web of position practices, external structures and agents-in-context (3.4.3). While Stones' elaboration on the concept of internal structures is crucial in this regard, Giddens' terminology was still found to provide a helpful framework with which to examine an agent's conjuncturally specific internal structures. To this end, exploring how accounting information is implicated in an agent's internal structures

of signification, legitimation and domination facilitates an understanding of what informs that agent's use of accounting information during NPD.

Jack, Topwood's Head of Operations draws on accounting information as a legitimation structure that sets out what he believes are the normative expectations associated with NPD. These legitimation structures are intrinsically tied to associated domination structures because Jack believes that Magma uses the accounting information during the NPD process to set out key aspects of power and autonomy within the Group (6.3.2). Believing that all NPD decisions must be 'backed up' by accounting information, Topwood's Head of Finance, Paul, also draws on accounting information as a legitimation structure which sets out norms and rules against which NPD behaviour can be assessed (6.4.2). Topwood's Managing Director, Nick, draws on accounting information as a key signification structure during NPD, regarding it as the primary means of communication between the Steering Committee and the NPD Team. Given that Nick views his role as one of 'overseeing' NPD as a member of the Steering Committee, these signification structures are tied to associated legitimation structures (6.5.2). All three managers' primary engagement with accounting information during NPD is in the context of the formal NPD process.

Metbuild's Head of Operations, Pete, uses accounting information more frequently on an informal basis from the very early stages of the process to resolve NPD issues and make day-to-day NPD decisions. In doing so, he is drawing on accounting information as a signification structure that provides a company-wide interpretive scheme with which everybody in the company can communicate about NPD (6.6.2). Des, the Head of Finance (6.7.2), and John, the Managing Director (6.8.2), draw on similar interpretive schemes and discursive practices. In continuing to draw on accounting information in this manner, all three agents-in-focus in Metbuild are constantly confirming and reproducing these signification structures. These signification structures are intrinsically tied to the legitimation and domination structures which underpin them. While accounting information, particularly in this informal context, does provide the agents in Metbuild with a language with which everybody may understand NPD issues, within the formal process, it effectively communicates the norms and expectations which must be adhered to during NPD-norms and expectations which are imposed by the parent company Magma. It does

this in the same way as it does in Topwood, however, the fact that Metbuild's managers appear less threatened by accounting information in this formal context could be associated with their comparative experience and ease with it in an informal context:

Look it... people know the score here. Everybody has become very cost conscious and that's because of good accounting information. There's no surprises when it gets to Steering level (*John, Managing Director, Metbuild*).

As discussed in the previous section, this experience and ease with informal accounting information is influenced by the enduring dispositional commitment to profitability and financial accountability by the Metbuild managers. This illustrates the complex relationship between an agent's dispositional frame of meaning and their more conjuncturally specific understandings and is explored further in Section 7.5.2.2.

Internal structures encapsulate those structures embedded within an agent's own knowledgeability. Giddens (1984) describes knowledgeability as what agents know about that they do and why they do it. Some of this knowledgeability consists of enduring memory traces and cultural schemas developed in the agent's habitus. Some of it is contextualised knowledge of specific conditions. All of this knowledgeability is constantly evolving through continued interaction with external structures. This is explored in Section 7.5.2.

7.4 ACTIVE AGENCY

Active agency refers to those dynamic moments during NPD when managers take action. An understanding of the agent's internal and external structures gives meaning to the action, but the action takes its final shape in the 'doing' of an action or interaction at a particular time or place (3.4.4).

The objective of this study is to explore the role of accounting information in NPD so the instance of active agency focused on in the analysis is that moment when managers use accounting information. It is difficult to discuss this without becoming embroiled in the process of structuration which takes place when that instance of active agency occurs. This is because agency is examined in both brackets of the

process of methodological bracketing applied to the findings in Chapter Six. Conduct analysis involves examining the agent's dispositional and conjunctural internal knowledge, as well as his reflective monitoring, ordering of concerns, hierarchy of purpose and motivation, all critical components of agency. Context analysis involves examining the terrain facing the agent but, while doing so, recognising the interactions between the internal and external aspects of the agent that lead to agency (3.4.6). This illustrates the duality of structure first introduced by Giddens — the inseparability of structure and agency, meaning that structures are both the medium and the outcome of social interaction.

An overview of active agency in the context of these findings is presented in this section. However, this dynamic moment in which agents choose to act can never be fully uprooted from the other parts of the structuration cycle. Within the structuration construct, agency and structure are conceptualised as a mutually interacting duality with neither superseding the other. This moment in structuration is at all times deeply entrenched in the internal and external structures through which agents act (4.4.5). Therefore the most compelling aspects of active agency emerge in Section 7.5 which examines the outcomes of the agents' conduct.

Accounting information as an external structure is presented in the findings as basic stocks of data comprising accepted conventions and codes familiar to everyone. Whether a manager uses these stocks of data in a formal or informal context during NPD depends on that manager's internal structures (7.2.2). The collaboration of these internal and external structures is manifested in the individual's active agency, or use of accounting information, and that active agency provides its own insight into accounting information. For instance, managers using accounting information as part of the formal NPD process review specific items of accounting information at scheduled, predetermined times throughout NPD. Managers using accounting information on an informal basis during NPD use *ad hoc* items of accounting information as and when they need it. In this sense, the use of accounting information during the formal NPD process appears to emphasise the structural element of the duality of structure, while accounting information used in an informal capacity appears to emphasise agency. This is consistent with Giddens' (1984) study which reports that, in routine situations, structures tend to dominate agency but, in situations

characterised by sharp changes in conditions, established routines are undermined and systems are likely to change through the actions of agents (3.2.2). Members of the NPD Team, in facing changing conditions and new information every day, must supplement the formal NPD process in order to effectively develop new products. This results in modified structures of accounting information, discussed in Section 7.5.1.2, and has implications in terms of the decentralisation of accounting information throughout the company, which is discussed in Section 7.5.2.2.

7.5 OUTCOMES

At a very early stage in the study it became clear that the use of accounting information is a social phenomenon meaning that it influences or is influenced by how people relate to each other. Examining the outcomes of structuration provides valuable insights into that social phenomenon because it involves examining the results of social interaction and consequently shows how this social interaction is implicated in the role of accounting in NPD. This is critical because it provides depth of insight into why managers act in the way that they do.

Section 7.5.1 discusses the outcomes of structuration in terms of modified external structures, while Section 7.5.2 discusses outcomes in terms of modified internal structures, although the interactive and collaborative nature of these structures is such that there are frequent references to both throughout each section. Section 7.5.3 discusses other kinds of outcomes evident in the analyses.

7.5.1 Modifications in external structures

Outcomes are evident in the modification of three key external structures; the NPD process, accounting information and the Finance function. The NPD process and the routine practices associated with it have evolved over time. These changes have had clear implications for how accounting information is used in a formal context throughout NPD (7.5.1.1). Accounting information itself is an important external structure setting out recognisable procedures and accepted conventions which managers draw on during NPD. Whether these recognisable procedures and accepted conventions are used by managers in a formal or informal context during NPD is an

important outcome of structuration (7.5.1.2). The Finance function in each company forms a significant element of the managers' structural context of action. Both Finance functions have been subject to modification resulting from the interaction between internal and external structures in each company (7.5.1.3).

7.5.1.1 Revised NPD process

The routinised practices associated with the NPD process and the use of accounting information within this process are an expression of the duality of structure at play. As agents draw on these routines in order to act, they contribute to the reproduction of the routines. However, routines change through the action of individual agents and new routines can emerge. This is illustrated in the revised NPD process described in Section 5.5. As set out in Section 6.3.1, Topwood's Head of Operations, Jack, was amongst the most vocal lobbyists for a revision to the original process and he suggested that too much time was being spent on projects that were rejected at later stages. The result of this modified external structure is that accounting information is pushed further downstream with more emphasis being placed on market analyses at the earlier stages because market information is considered the most accurate early indicator of a new product's potential. This reinforces the point that, in a formal capacity, accounting information is about legitimising decisions that have already been taken and providing senior management with more certainty in advance of the commitment of financial resources. This issue is discussed in more detail in the next section.

7.5.1.2 Formal and informal accounting information

As described in Section 7.2.2, external structures of accounting information comprise recognisable procedures and accepted conventions that pre-exist the managers using them. The terms 'return', 'investment' and 'profit' are concepts familiar to most people working in a commercial environment. Through structuration, these external structures are shaped and moulded to individual managers in particular circumstances. This is evident in the distinction between accounting information used in a formal context and that used in an informal context.

The formal NPD process requires the examination of specific items of accounting information at predetermined times. This could be characterised as ‘push’ information and is generally prepared and, more importantly, presented to the Steering Committee by the Finance function. In Section 6.6.2, it is suggested by Metbuild’s Head of Operations that accounting information is only relied upon by the Steering Committee to make stage-gate decisions when it is presented or delivered by an accountant. Members of the Steering Committee have come to rely on accounting information being presented to them at particular points in the process by certain individuals to give them comfort with regard to their stage-gate decisions. In using accounting information in this manner, the Steering Committee are drawing on their own internal legitimation structures whereby accounting information sets out the norms and expectations against which NPD decisions can be examined. In relying on the Finance function to present this information, the Steering Committee have come to draw ontological security from the routinised procedures and recognisable behaviours associated with Finance. Members of the NPD Team, cognisant of how the Steering Committee views accounting information and the consequent importance of Finance in preparing and presenting this information, draw on associated domination structures, since accounting information is perceived to be setting out the order of dependency and autonomy within the Group.

In contrast, accounting information used in an informal capacity could be characterised as ‘pull’ information in that it is prepared by members of the NPD Team as needed, with support from the Finance function when necessary. It is based on the same recognisable procedures and accepted conventions as the formal information but the process of structuration around it differs therefore leading to different structural outcomes. As outlined in Section 7.2.2, informal accounting information facilitates day-to-day cross-functional dialogue throughout NPD. Managers on the NPD Team are drawing on internal structures of signification whereby accounting information provides a system of interpretive schemes and discursive practices with which everybody collaborates and engages on NPD issues. This, however, will not work everywhere. As is evident in the contrast between Topwood and Metbuild, these signification structures are more effective when the dispositional perspective of the user is more accepting of it, and this dispositional perspective is enhanced by cross-functional interactions and collaboration. The complex relationship between

dispositional and conjectural internal structures is discussed in more detail in Section 7.5.2, which examines internal structures as outcomes, but it is sufficient to note at this point that it does provide some interesting insights into the evolution of accounting information as an external structure. Accounting information in a formal context brings routine and structure to NPD while accounting information in an informal context both results from and facilitates interaction and collaboration amongst NPD participants. The ongoing interaction and collaboration, which is more evident in Metbuild, bring about more aligned dispositional perspectives amongst the Metbuild managers, which further influence their conjuncturally specific internal structures.

While it is true that there is no black and white distinction between formal and informal accounting information in an NPD context, the former appears to emphasise the structural element of the duality of structure while the latter emphasises the agency aspect (Section 7.4). Stones (2005) is helpful in exploring how accounting information can manifest itself as an external structure in such very different ways. Stones pays particular attention to the nature of the autonomy of external structures. He describes independent causal forces as those which are entirely outside of the control of the agent, while, according to his view, an agent's ability to control an irresistible causal force is bound up with that agent's own wants, desires, attachments, dispositions, orientations and bonds (refer to Section 3.4.2). These findings suggest that the distinction between formal and informal accounting information in NPD is associated with the amount of control managers themselves have over external structures of accounting information. Accounting information in a formal context is tied into the formal NPD process. It is not entirely independent of the agent in that it is subject to modification and change in the long term, as illustrated in Section 5.5, but it is relatively generic and homogenous from project to project. In contrast, accounting information used on an informal basis during NPD is fluid and dynamic, evolving on a day-to-day basis. In its informal capacity, accounting information is shaped and moulded to individual managers in particular circumstances, sometimes consciously and sometimes unconsciously, as a result of the interaction of their internal and external structures.

7.5.1.3 *Contrasting Finance functions*

The findings illustrate how the Finance function is subject to modification as a result of the interactions between internal and external structures. Topwood's Head of Finance, Paul, believes that he and his Finance function have created, within Topwood, a widespread understanding of accounting-related issues such that everybody has a good understanding, from early in the NPD process, of the financial implications of their decisions. As set out in Section 6.4.2, he believes that this is in his own best interests in that it saves him time in trying to convince the NPD Team of the financial implications of their decisions. However, as set out in Section 6.3.1, Topwood's Head of Operations, Jack, does not describe the Finance function as particularly supportive in terms of broadening his understanding of the accounting implications of NPD:

My ideal is that they assign a project accountant on day 1 who is basically there from the beginning, to start making a financial case so that we know up front, is there a financial case or not? so that we don't go down the road of spending a lot of hours putting something together only to get it kicked into touch at the 11th hour, which happens... (*Jack, Head of Operations, Topwood*).

Jack criticises the communications skills of the Finance team:

I mean in terms of running the numbers and being the gatekeeper of the key financial metrics that's fine. But the communication is not good. And I think perhaps what's missing at the end of the day is communication. Not any sort of professional abilities or whatever, I mean they're unquestionable, it's just communication I feel, it sucks... (*Jack, Head of Operations, Topwood*).

As a result, he perceives the Finance function as being somewhat disengaged from the NPD process:

They [Finance] are control freaks [sic]... that's why they won't take ownership, it's lovely to be the sniper on the fence just picking people off, and you have no responsibility, you can make people's life a misery. Whereas if you're involved at the outset in a participative way it's helpful (*Jack, Head of Operations, Topwood*).

Paul's failure to successfully balance the accounting information demands of the various stakeholders in NPD is reflected in Jack's internal structures. Jack believes that accounting information during NPD represents the values and ideals of one dominant party, Magma (6.3.2) and it therefore conflicts significantly with his

innovative drive and spirit (6.3.1). Topwood's Managing Director, Nick, also maintains that Topwood's Finance function has made no particular effort to empower or equip the rest of the company with any particular financial know-how. However, from within his dispositional commitment to Magma's strategic progress, he is happy that the company's financial discourse communicates a clear set of values and expectations that reflects the wishes of the parent (6.5.2).

The analyses of Metbuild's agents-in-focus in Chapter Six provide an illustrative contrast. Its Head of Operations, Pete, describes using accounting information on an informal basis in order to develop an early sense of the viability of their new product ideas and to understand the implications of his decisions. As the NPD process progresses and decisions lead to greater financial commitment, the Finance function is called into the process to lend more credibility to the financial analyses and to legitimate the NPD Team's actions, at least in the eye of the parent company Magma. This illustrates how Metbuild's Finance function has deliberately empowered the rest of the team with a strong financial know-how such that they do not need to rely on the Finance function for day-to-day involvement in NPD, although they have retained a role themselves as the ultimate 'financial gatekeepers' of the NPD process:

Most of us in this business are in it for twenty odd years, we have the basic maths of it so that if it doesn't stack up, we just don't go near it. If you get to a point where we know where we're at... I have access to all of that type of information, so you look at them and you think this could be a potential flier so you capture the real numbers, and it all comes down to numbers... Then you get to a stage with this and you can't get any further until you test it financially. So then at that stage there would be quite a lot of involvement from Finance, all projects here go through Des anyway. But Des has a hell of a lot of experience as well, he can do it quickly, he can tell us, 'well look you need to go back and do X' (*Pete, Head of Operations, Metbuild*).

Metbuild's Head of Finance, Des, has been more successful in empowering his colleagues with financial know-how. He leads an effective and supportive Finance function and has 'generalised' accounting information to become a language in Metbuild that has gone on to influence the dispositional frames of the Head of Operations and the Managing Director, as outlined in Section 7.3.1. Des' capacity to engage in dialogue with everybody throughout the organisation at all levels means that he is successfully balancing the often conflicting demands of his role. In

simultaneously contributing to control and decision-making in this manner, Des is performing the business partner role much discussed in the literature (2.5).

Furthermore, Des has actively sought to expand his role. As set out in Section 5.5.1, Metbuild's *EBuild* project has just entered Stage 6 of the NPD process. At this stage, the Steering Committee has reviewed very little accounting information but a significant amount of such information has been prepared and reviewed by the NPD Team, Des himself having played a critical role in the preparation of much of this information. Des states that the Finance function sought out a more active involvement in the earlier stages of the *EBuild* development. Chapter Five describes how the formal NPD process has evolved with the effect of pushing accounting information further downstream, suggesting that accounting information and, consequently, the Finance function is becoming less important in NPD. As is evident in the *Ebuild* project, Des has responded to this by actively cultivating a role in NPD outside of the formal process. Des' actions in this regard have gone on to influence the external structural context and internal structures of the other agents-in-focus in Metbuild. Of course, this is not attributable to Des alone. His success in this is aided by Pete's and John's dispositional commitments to financial accountability and profitability.

7.5.2 Modification in internal structures

Outcomes are just as evident in the managers' internal structures. The findings illustrate the relationship between the agents' experience of interacting with their conditions of action and the emergence of their general dispositional frame (7.5.2.1). Interactions between the managers' dispositional perspective and their conjuncturely specific internal structures also leads to outcomes in structuration (7.5.2.2) as does the web like nature of structuration on the interacting structures of networked agents (7.5.2.3).

7.5.2.1 Emerging dispositional frames of meaning

The clearest illustration of the relationship between external structures and the development of dispositional frames is the gradual impact of Magma in conditioning the agents' enduring dispositional schemas. A recurring theme throughout this discussion has been the differing dispositional frame of Jack (Topwood's Head of Operations) and Pete (Metbuild's Head of Operations). A key element of both Jack's and Pete's conditions of action is their parent company, Magma. Their contrasting perspectives appear to be associated with their contrasting experiences with Magma. Topwood's ageing plant has received little or no financial investment from Magma since its acquisition, with the result that Topwood's current product offering is inflexible and overly commoditised. This does not adhere to Magma's strategic objective of reducing the division's reliance on the commodity-based construction industry (5.2.3.2). Since Magma's acquisition of Metbuild in 2006 for €67.8m, it has invested a further €17m in plant improvements thereby allowing Metbuild to broaden its product range and decommoditise its product offering (5.2.4.2).

These findings demonstrate how Jack and Pete's contrasting experiences with Magma have gradually shaped their dispositional frames of meaning. Pete demonstrates a dispositional commitment to Metbuild's profitability, a dispositional commitment which is reinforced by his conjunctural perception of accounting as an interpretative with which he makes NPD decisions every day. Jack is less committed to Topwood's profitability. He is instead focused on technical innovation and creativity and feels constrained by his conjunctural perception of accounting as a tool used by Magma to control him. From within their dispositional perspectives, they each draw on different conjuncturally specific internal structures, all of which impacts how they use accounting information. This point is discussed further in the next section, which further examines Jack's and Pete's opposing internal structures.

7.5.2.2 Conflict between dispositional frames of meaning and conjuncturally specific internal structures

Jack uses accounting information principally in its formal context to persuade Magma to invest in NPD projects. Jack's attitude to accounting information is influenced by his general dispositional commitment to innovation and technical advancement which he feels is severely constrained by conjuncturally specific sanctions imposed by accounting information. This internal knowledgeability is informed by Jack's belief that Magma uses accounting information to exercise power and exert influence over the NPD process.

Metbuild's Head of Operations, Pete, uses the accounting information contained within the formal NPD process to persuade Magma to invest in projects. However, he also uses accounting information on an informal basis to make day-to-day decisions throughout the NPD process. Pete demonstrates a dispositional commitment to profitability and financial accountability. Despite having a similar educational and professional background to Jack, Pete is influenced by an overriding set of dispositional perspectives, values and sentiments which are firmly embedded in Metbuild's financial performance. This enduring dispositional outlook is evident in all three of Metbuild's agents-in-focus. Pete's internal knowledgeability draws on these general dispositions as well as on more conjuncturally specific dimensions, with each supporting and informing the other.

Section 7.5.2.1 discussed how an agent's experience of their external structures is implicated in their internal structures. This section discusses the interaction between internal structures. These findings illustrate the internal negotiation which takes place between, on the one hand personal values and dispositions, and on the other, conjuncturally specific internal structures. Jack's dispositional and conjunctural internal structures are in conflict to such an extent that his experience of accounting information is of an imposing, constraining influence. In contrast, Pete's dispositional and conjunctural internal structures are less conflicted. In fact, they reinforce each other to such an extent that accounting information provides him and his colleagues in

Metbuild with a means of understanding their NPD activities which allows them to communicate meaningfully and make day-to-day decisions about those activities.

These findings are significant in that they demonstrate how the degree of conflict between the agents' dispositional frames of meaning and their conjuncturally specific internal structures is associated with their respective use of accounting information during NPD. This provides further insight into an agent's internal structures. Dispositional frames of meaning are borne out of knowledge built up over time. Conjunctural knowledge is more specific to a given time, place or circumstance. These findings highlight how internal conflict between the two can be implicated in an agent's behavior.

7.5.2.3 The web-like nature of structuration

Critics of Stones' structuration model discuss its weakness in recognising the interactions between internal and external structures at sub-divisional levels and its lack of regard for the web-like nature of structuration (3.5.1). These findings address this gap. The micro analyses of six specific agents-in-focus conducted in this study recognise that a given agent may be first and third person depending on whom the lens of structuration is focused on at any given time. Once the six analyses are complete it is possible to widen the lens to encapsulate all of the micro-analyses, facilitating a detailed examination of the interactions between agents, specifically the overlapping nature of structures amongst the agents. This is particularly evident in the examination of the companies' respective Managing Directors, who were highlighted as important external structures in Section 7.2.5.

Each Managing Director has a very different perspective on the importance of accounting information in NPD. Topwood's Managing Director, Nick, views it as ancillary at best, suggesting, as noted in Section 7.2.5, that accounting information will never stop the process. In contrast, Metbuild's Managing Director, John, considers accounting information to be a critical aspect of NPD decision-making:

It was the case back then [in 1985] and it is the case now, the decisions follow the financial analysis - no ifs or buts... accounting information is the ultimate driver of whether it's a runner or not (*John, Managing Director, Metbuild*).

Nick and John's similar positions in the Group, juxtaposed with their contrasting experiences, demonstrate how each of their lived experiences are implicated in their perceptions of the role of accounting information in NPD. However, their contrasting phenomenologies affect how they use accounting information in NPD and, furthermore, their respective behaviour influences the culture in each company, which informs the dispositional frame of other agents-in-focus.

Nick and John offer the primary connection between the NPD Team and Magma via the Steering Committee. John's regular interface with Metbuild's NPD Team brings Magma closer to the team, making the parent company seem less threatening, and even supportive. In contrast, Nick is less involved with Topwood's NPD Team and is not particularly engaged with accounting information or the Finance function in an NPD context. As a result, members of Topwood's NPD Team are more alienated from Magma than members of Metbuild's Team.

Metbuild's three agents-in-focus are all influenced by a commitment to financial accountability, profitability and a recognition that the Finance function is an important contributor to NPD. This could be attributed to the attitude and outlook of Metbuild's Managing Director:

It's not a one-man thing here, no one person is driving it on... NPD is a group thing together - finance, engineering, manufacturing, personnel, sales - they have to work very much hand in glove... I believe that none of us are very good at what we do, but together we capitalise on synergies (*John, MD, Metbuild*).

Topwood's three agents-in-focus view the Finance function as carrying out a more ancillary role and offering few meaningful insights. This could also be attributed the attitude of Topwood's Managing Director:

All you need is a set of accounts and a bit of financial analysis around that to be able to compare apples with apples...as I said, the biggest factor with any product or process development is not the financial resource, it's the technical resource (*Nick, MD, Topwood*).

Similar overlapping is evident between the structures of the Heads of Finance in each company and the other agents-in-focus. These issues have been explored at length when discussing the Finance function as an external structure (7.5.1.3).

These findings illustrate the interacting and overlapping nature of internal and external structures when examining a number of agents within a given conjuncture.

7.5.3 Outcomes as events

As set out in Chapter Three, outcomes can sometimes take the form of events. These events include all other kinds of outcomes irrespective of their effect upon structures. An examination of these outcomes requires one to strip out the structural context and observe some of the simpler consequences of social interaction (3.4.5).

A key outcome of the social interactions examined in this study is the development of some new products and the deferral of some new product projects (7.5.3.1). The distribution of accounting information and the resulting empowerment of managers outside of the Finance function is another important outcome (7.5.3.2) as is evidence of the changing role of the accountant (7.5.3.3).

7.5.3.1 New product development

A critical outcome of structuration evident in these findings is the development of new products. Topwood have launched two new products between 2007 and 2010 (5.3). This includes *BuildSafe* which was launched to the market at the end of 2009 and achieved turnover exceeding €700,000 in 2010 (5.4.1). Metbuild have launched four new products in the same period (5.3) and are currently working on a large scale project, *Ebuild*, in conjunction with their JDA partners. This partnership agreement with *Ucon* is itself an important outcome of structuration. This is the first time either of the MMD companies has entered into a joint venture and this arrangement has already been found to initiate some changes in the way informal accounting information assumes a greater role earlier in the NPD process (5.5.1).

In addition, a number of projects in both companies have been prevented from progressing to completion. These are discussed in Section 5.6. Most are stopped at the project scope definition stage when the analysis reveals that the company does not have the manufacturing or resource capacity to complete the project. These projects

are referred to as ‘parked’, meaning that they will resume when the resources become available. Other projects have been stopped at earlier stages when market analysis reveals insufficient market demand. These projects are ‘banked’, to be resumed if market conditions change. This illustrates the value of the formal NPD process. All potential opportunities are explored to the same degree and while only a small number of projects progress to completion, all projects are subject to the same process of rigorous analysis:

Look it, we needed a sieve to filter out the rubbish... but without throwing out the baby with the bathwater (*Bill, Chief Executive, Magma*).

This is what Magma wanted when they commissioned the development of a formal NPD process and these findings would suggest that they achieved success of purpose in this regard.

7.5.3.2 Decentralisation of accounting information

Another important outcome of structuration evident in Metbuild is the decentralisation of accounting information. The findings reveal that accounting information is drawn upon, in an informal context throughout NPD, as a language, or given understanding, with which managers can understand the implications of their decisions on a day-to-day basis (7.2.2). This is attributed to the quality of the accounting information distributed by Metbuild’s Finance function (6.6). This decentralisation of accounting information empowers everybody throughout the organisation and is indicative of a strong Finance function.

There are clear differences between accounting information used either formally during the NPD process or accounting information used informally in the wider NPD environment. Informal accounting information is collated by members of the NPD team themselves with some support from Finance where necessary. For instance, section 5.7 describes how Metbuild’s Head of Operations had prepared some figures examining the costing implications of buying upright or flat condensers for the *EBuild* project. He described it as a ‘back of a matchbox’ analysis and expressed amusement at the idea that this would be considered accounting information, despite the fact that he wanted to run the figures by the Head of Finance to ensure that they were correct.

This reflects a significant amount of informal accounting information use. It is initiated and frequently prepared by members of the NPD Team themselves on an improvised basis and it is quite possible that the Finance function has little or no direct involvement with it. In this context, accounting information is shaping new product design and informing new product development at the early stages while the product is still fluid.

The management accounting literature of the past decade has suggested that accounting information would become so widely dispersed that managers would have ready access to information previously provided by the accountant. In response accountants would have to cultivate a more commercially oriented role in order to remain relevant (3.5). These findings are consistent with this literature but the findings also reveal that senior managements' ongoing need for ontological security retains the accountant as the ultimate score-keeper. The challenge facing the accountant is how best to balance the two roles. In these findings, Metbuild's Head of Finance is achieving this balance to better effect than Topwood's. This outcome is discussed in more detail in the next section.

7.5.3.3 The changing role of the accountant

It is clear from the findings that managers in different circumstances have different expectations of their Finance functions. Members of the Steering committee require synopsis, aggregated schedules of accounting information at predetermined times in the latter stages of the formal NPD process. Members of the NPD Team want support in preparing accounting analyses at short notice, from the early stages of NPD, often before the formal process has begun (7.5.1.2). As a result Des (Head of Finance, Metbuild) and Paul (Head of Finance, Topwood) are regularly presented with conflicting accounting information demands. The findings suggest that Des is balancing these conflicting demands to better effect (7.5.1.3). He is regarded as providing an enabling and supportive service to members of the NPD Team while still retaining a role as the financial gatekeeper of NPD from the perspective of the Steering Committee.

Metbuild's Head of Finance (Des) has evolved into a type of business partner who successfully balances the conflicting accounting information requirements of the Steering Committee and the NPD Team. Topwood's Head of Finance (Paul) has not evolved in the same manner. In an NPD context an effective business partner relies upon a financially astute NPD Team. Both Des and Paul refer to the importance of empowering the NPD Team with financial know-how such that they can understand the financial implications of their day-to-day NPD decisions. Des has been successful in this regard, Paul has been less so. However, Paul's actions do not necessarily reflect his ideals in this regard. Topwood's Head of Operations and Managing Director are not particularly empowered which suggests that Paul's efforts in this regard have not been commensurate with his Metbuild counter-part Des.

7.6 CONCLUSION

This chapter framed MMD's NPD environment in Structuration Theory allowing a detailed examination of each aspect of the structuration process which informs the managers' use of accounting information during NPD.

Section 7.2 discusses the external structures and associated position practices which provide the managers' with their structural context of action. The NPD process, accounting information, other information structures, the Finance function and the Managing Director in each company have a value dependant influence over the managers' behaviour. The parent company and more societal level factors such as the competitive market and foreign exchange fluctuations are also key aspects of the managers' external conditions. These findings reveal complexity in terms of the varying degrees of autonomy inherent in external structures which make the distinction between independent and irresistible external structures less clear.

Section 7.3 discusses the managers' internal structures, exploring those aspects of the managers' internal knowledgeability which inform their behaviour. This internal knowledgeability is at all times subject to modification through continued interaction with external structures. Section 7.4 discusses the active agency element of structuration. Active agency is complex because it is difficult to disentangle agency

from the internal and external structures to which it is so tightly bound. This is because of the inseparability of agency and structure implied in the duality of structure. It is helpful to conceptualise active agency in terms of a manager's use of accounting information during NPD. His use of it in a formal capacity emphasises the structural element of the duality of structure while his use of it in an informal capacity emphasises the agency aspect.

Section 7.5 discusses the outcomes of structuration. This examination of outcomes is a critical element of the discussion. The duality of structure is based on the concept that structures are the medium and outcome of social interaction. This means that internal and external structural outcomes constitute internal and external structures at the next round of structuration. This is how we learn why structures evolve and how the evolution of those structures are implicated in managers' behaviour.

Modifications to external structures are discussed in Section 7.5.1. Through structuration, external structures of accounting information are shaped and moulded to suit particular managers in specific circumstances. In this way the use of accounting information, in either a formal or informal context, is itself an outcome of structuration. Modifications to the routinised practices associated with the NPD process have pushed the Steering Committee's reliance on accounting information further downstream in the process. This reinforces the sense that, in a formal context, accounting information is about legitimising decisions already taken based on other information structures. Metbuild's Head of Finance (Des) is comparatively more successful than Topwood's Head of Finance (Pete) in balancing the conflicting accounting information demands of the various stake holders in NPD. Through structuration, Des has evolved into a type of business partner who empowers the NPD Team with financial know-how such that they can understand the financial implications of their decisions on a day-to-day basis, while simultaneously retaining a powerful role as the ultimate financial gatekeeper of NPD.

Outcomes are also evident in the modification of internal structures discussed in Section 7.5.2. A clear illustration of the relationship between external structures and the development of a manager's dispositional frame is evident in the contrasting dispositional perspectives of the Heads of Operations in Topwood and Metbuild, each

of whom have had very different experiences with the parent company Magma. As internal structures evolve, conflicts may emerge between an agent's dispositional and conjunctural internal knowledge which can be implicated in that agent's conduct. Stones' model has been criticised for its lack of regard for the web-like nature of structuration. These findings address this gap. They demonstrate how each Managing Director's contrasting phenomenology affects not only how they use accounting information in NPD, but their conduct influences the culture within each company, which informs the dispositional frames of the other agents-in-focus within their network of position practices.

As discussed in Section 7.5.3 the outcomes of structuration can also take the form of events, irrespective of their effect upon structures. The development of some new products and the deferral of some new product projects, the decentralisation of accounting information and the changing role of the accountant were identified in this study as important structural outcomes regardless of their structural context.

The next chapter concludes the study by drawing together the major findings and key contributions of the study.

Chapter Eight

SUMMARY AND CONCLUSIONS

8.1 INTRODUCTION

The primary motivation for the study arises from the fact that for most organisations NPD is of paramount importance to sustaining competitiveness. Accounting information is presented in the literature as a valuable NPD resource which facilitates cross-functional dialogue, communicates profitability objectives and supports managers in managing resources and controlling costs. However, the literature provides an unclear picture of how managers use accounting information during NPD. In response, this study explored the role of accounting information in NPD.

The chapter begins by presenting an overview of the study which provides insight into the emergent nature of the research. An overview of the dissertation is provided in section 8.3. The main findings of the research are summarised in section 8.4. The conclusions of the study are set out in section 8.5 while the study's key contributions are set out in section 8.6. The limitations of the study are outlined in section 8.7. Suggestions for future research are detailed in section 8.8.

8.2 OVERVIEW OF THE STUDY

Prompted by a wealth of literature discussing the transformation of the accountant's role from a bean-counter to a business advisor (1.4) as well as increasing reports of companies adopting a cross-functional, collaborative approach to developing new products (1.3) this study initially set out to explore the role of accountants in NPD. The initial literature review revealed a shortage of literature examining the area and so exploratory interviews were conducted with managers in Metbuild at quite an early stage in the study, in order to develop an insight into the relevant themes and issues. The means by which this exploratory data were gathered and analysed are discussed in detail in sections 4.7.2 and 4.8 respectively. The most significant aspect of these exploratory findings was that the stories these managers told were less about the role of the accountant in NPD and more about the role of accounting information in NPD. It emerged that accounting information in an NPD context extended far beyond the Finance function and so it was decided that making accounting information the

subject of the study was a potentially more fruitful approach than a narrow focus on the role of accountants.

Given the variety of contemporary accounting techniques available to managers to assist in the formulation and implementation of organisational strategy (2.3.2) the next logical step in this research was to explore how techniques such as lifecycle costing, target costing, strategic cost management and the balanced scorecard enhance the role of accounting information in NPD. These techniques did not emerge as relevant in the exploratory interviews. The managers interviewed were familiar with the concept of the balanced scorecard and case data gathered later in the study revealed that Magma use something comparable to a balanced scorecard to review performance at group level, but it had little impact on these managers' use of accounting information during NPD. Techniques such as lifecycle costing, target costing and strategic cost management, or the principles underlying these techniques, did not resonate with the managers interviewed. This conflicts with the literature on contemporary management accounting tools and techniques, much of which suggests that these techniques are particularly useful in NPD environments (2.3.2).

It was then decided to focus on the nature of accounting information, particularly, to explore the factors which lead a manager to regard accounting information as useful. A significant amount of management accounting research has focused specifically on characteristics such as timeliness (Belkaoui, 1980), relevance (Bruns and McKinnon, 1993), consistency (Jonsson and Gronlund, 1988), accuracy (Pierce and O'Dea, 2003), aggregation (Chenhall and Morris, 1986), flexibility and adaptability (Mendoza and Bescos, 2001), scope (Mia and Chenhall, 1994) and reliability (Bougen, 1994). This stage of the study amounted to a search for the prescriptive qualities which make accounting information useful in an NPD context. What emerged is that accounting information is by no means normative or prescriptive. It varies considerably in meaning and use from manager to manager which led the researcher to believe that an understanding of accounting information is intrinsically tied to the manager who uses it. In this way, the managers' use of accounting information emerged as a social phenomenon to be explored.

The study required a theoretical framework which would support the exploration and interpretation of social phenomena. Most social theories may be distinguished between whether they have an objective or a subjective view of the world. Those with an objective view maintain that structure predominates over agency (e.g. structuralists), while those with a subjective view maintain that agency determines structure (e.g. individualists). Structuration Theory resides in the middle ground between these two extremes, meaning that social interaction contains both subjective and objective elements, i.e. human agency is subjective but such agency creates structures which become externalised and therefore capable of objective analysis. Structuration Theory emerged as an appropriate theoretical lens through which to examine the role of accounting information in NPD primarily because it places agency and structure, that is people and practice, equally at the centre of the analysis.

Structuration Theory is particularly suited to case study analysis because it supports the search for an in-depth understanding of specific phenomena in a particular time and place (4.10). Magma was an ideal case site because in Topwood and Metbuild it presents two companies, similarly positioned within the group structure, adhering to the same group reporting requirements, following the same formal NPD process and answerable to the same NPD Steering Committee. Yet accounting information is viewed differently by managers in each company. An in depth understanding of the role of accounting information in NPD could be sought through a detailed examination of the social interactions surrounding accounting information use in each site.

8.3 OVERVIEW OF THE DISSERTATION

Empirical literature reviewed in Chapter Two suggested how accounting information ought to contribute to NPD and outlined the role the Finance function ought to play in facilitating this. Actual empirical evidence in this area is scarce, restricted largely to examinations of the role of Finance in innovation and NPD. In addition, what does exist is fragmented and contradictory- one stream of literature describes Finance as having little more than an ancillary influence over NPD while a conflicting stream reports Finance playing a proactive role in NPD. These findings are in the context of

concerns expressed in the wider management accounting literature regarding the extent to which accounting information can satisfy managerial needs in a contemporary business environment.

Chapter Three provided a critical account of Structuration Theory as originally introduced by Giddens (1984) and further developed by Stones (2005). Structuration Theory has been subject to decades of challenge and debate which in itself has provided the key building blocks of the theory. Chapter Three acknowledges this debate and embraces these challenges, ultimately presenting Stones' strong structuration model as the theoretical lens through which the data were analysed.

Data were gathered by means of an embedded case study conducted within a single organisation, MMD. A detailed account of the means by which the data were gathered and analysed is presented in Chapter Four. Initial findings from this process of data analysis are presented in Chapter Five, while Chapter Six presents the results of a more in-depth process of data analysis conducted using Stones' composite research strategy. The discussion in Chapter Seven presents a detailed examination of the internal and external structures which shape managers' use of accounting information during NPD.

8.4 SUMMARY OF THE FINDINGS

The findings consisted of two phases. The first provided a detailed description of the case site, the formal NPD process and the use of accounting information throughout the process. This phase concluded with a number of key observations. Each company works off the same formal NPD process. Within the formal process some accounting information is reviewed in the early stages but it is most prominent during the Business Analysis stage which is amongst the latter stages of the process. As the process has evolved this Business Analysis stage has moved further down-stream. In this context accounting information is being relied upon by the Steering Committee, at a relatively late stage in the NPD process, to inform their decisions regarding the commitment of financial resources to the project. These findings also provided evidence of accounting information being used, earlier in the process, on an informal

basis by members of the NPD team to inform their decisions with regard to product design and development.

These findings provided important insights into how managers differently situated throughout the group use accounting information in different ways, and even differ in their perceptions of what constitutes accounting information. Members of the Steering Committee are interested in sophisticated reports and calculations, presented by accountants. Members of the NPD Team require quick and simple answers to urgent and unplanned questions about costing implications and resourcing, and they do not necessarily need an accountant to be involved. Further differences were evident within the NPD Teams. Managers from Metbuild describe the institutionalised structures associated with accounting information in enabling and supportive terms, while managers from Topwood describe them as more of a constraining force. It was clear from the findings that these institutionalised structures could not be examined in isolation from the human beings who draw on them.

This recognition of agency as well as structure in the managers' use of accounting information underpinned the second, more in-depth phase of the study, the results of which are presented in Chapter Six.

Structuration Theory is based on the premise that structure and agency are not a mutually interacting duality but are simultaneously both the medium and outcome of social interaction (3.1). Giddens originally introduced this notion of the duality of structure (3.2) but Stones enhances our understanding of it through his presentation of the quadripartite nature of structuration. Stones' model breaks the notion of the duality of structure down into four analytically separate components- external structures, internal structures, active agency and outcomes. The duality of structure is evident in the outcomes which take the form of revised or modified structures or other kinds of outcomes and events (3.4). To accompany the quadripartite cycle of structuration Stones presents a composite research strategy. This is a series of steps which when applied to a particular agent can provide an insight into that agent's own processes of structuration. These steps can be applied over and over again to a number of agents differently situated within a given conjuncture. In the context of this study

this involved analysing the case data several times, each time using a different manager, or agent-in-focus, as the lens of analysis (4.10).

The six micro-analyses presented throughout Chapter Six illustrate just how much internal knowledgeableability varies amongst agents differently situated in relation to external structures. Significant differences are evident in the internal knowledgeableability of the three agents-in-focus in Topwood. The Managing Director (Nick) demonstrates a dispositional commitment to the Magma group, from within which he draws on accounting information as a signification structure with which he oversees the progress of NPD projects. The Head of Finance (Paul) demonstrates a dispositional commitment to profitability, from within which he draws on accounting information as a legitimation structure with which all NPD decisions must be justified. The Head of Operations (Jack) demonstrates a dispositional commitment to innovation and creativity, from within which he draws on accounting information as a domination structure which sets out the hierarchical order within the Magma group. All three managers are affected by their own internal and external structures and this has implications for each manager's very different attitude to accounting information.

Meanwhile, commonalities in the internal structures of Metbuild's Head of Finance (Des), Head of Operations (Pete) and Managing Director (John) mean that they react to their external structures in similar ways to each other. Pete demonstrates a dispositional commitment to profitability and financial accountability. From within this dispositional frame he draws on accounting information as a signification structure, providing a company-wide interpretative scheme with which managers from different backgrounds and in different circumstances can communicate about NPD issues. Des demonstrates a similar dispositional commitment to accountability and a desire for financial scrutiny, from within which he draws on the interpretative schemes provides by accounting information to draw together a wide range of NPD issues. John dispositional commitment to innovation, expansion and growth is grounded in financial accountability. From within this dispositional frame he draws on accounting information as a legitimation structure through which NPD decisions are made. However, these legitimation structures are closely tied to underlying signification structures as accounting information effectively communicates throughout Metbuild the norms and expectations underpinning all NPD decisions. The

collaboration of internal and external structures amongst these managers in Metbuild manifests itself in their attitude to accounting information, all three of whom view it as an enabling and supportive structure underpinning NPD.

These findings illustrate how each manager's conduct is guided by their phenomenological perspective in combination with their institutionalised structures, i.e. the collaboration of their internal and external structures. In this way, each manager's use of accounting information during NPD is an outcome of multiple structuration processes. This is evident in numerous examples of the modification of internal and external structures throughout the findings.

Modified internal structures are reflected in the gradual evolution of the managers' internal knowledgeableability. A clear illustration of the relationship between external structures and the development of dispositional frames is evident in the contrasting impact of Magma in conditioning the agents' dispositional schemas. A theme throughout this discussion has been the differing dispositional frame of Jack (Topwood's Head of Operations) and Pete (Metbuild's Head of Operations). Their contrasting perspectives appear to be associated with their contrasting experiences with Magma (7.5.2.1). The internal negotiation between the managers' dispositional and conjunctural structures is also reflected in their use of accounting information. Jack's dispositional commitment to innovation and technical advancement is constrained by the conjuncturally specific sanctions imposed by accounting information. Pete demonstrates less internal conflict and perceives accounting information as an enabling and supportive structure (7.5.2.2). Each Managing Director has a very different perspective on the role of accounting information in NPD. Topwood's Managing Director (Nick) views it as ancillary at best while Metbuild's Managing Director (John) considers it to be a critical aspect of NPD decision-making. Nick and John's similar positions in the Group, juxtaposed with their contrasting experiences, demonstrate how their lived experiences are implicated in their perceptions of the role of accounting information in NPD. However, their respective behaviour influences the culture in each company, which informs the dispositional frame of other agents-in-focus. This illustrates the over-lapping nature of internal and external structures when examining a number of agents within a given conjuncture (7.5.2.3).

Modified external structures are evident in the gradual changes in the institutionalised structures managers are confronted with. The NPD process has evolved over time, having clear implications for how accounting information is used in a formal context throughout NPD (7.5.1.1). External structures of accounting information consist of those recognisable procedures and accepted conventions that pre-exist the managers using them. Through structuration, these external structures are moulded to individual managers in specific circumstances. This is manifested in the distinction between accounting information used in a formal context and that used in an informal context (7.5.1.2). Through structuration, Metbuild's Head of Finance has evolved into a type of business partner, successfully balancing the conflicting accounting information demands of the various stake-holders in NPD. Topwood's Head of Finance has not evolved in the same manner (7.5.1.3).

Outcomes can also take the form of events which include all other kinds of outcomes of structuration regardless of their effect upon structures. The development of new products (7.5.3.1), the decentralisation of accounting information (7.5.3.2) and the changing role of the accountant (7.5.3.3) are critical outcomes of structuration in Topwood and Metbuild irrespective of their structural context.

Using the quadripartite cycle of structuration to frame the discussion, the findings of the study present a detailed examination of the internal and external structures which shape managers' use of accounting information. The interactive and iterative nature of these structures, both internal and external, is central to the discussion presented throughout Chapter Seven.

8.5 CONCLUSIONS OF THE STUDY

A number of key conclusions emerged and are discussed below.

8.5.1 The development of new products

Quality of execution of NPD is associated in the literature with the existence of a formal NPD process including a cross-functional approach and governed by stage-gate control (2.2). All three features are evident in these findings. Both companies follow the same formal NPD process, which consists of several stages with each stage separated by a stage-gate at which the Steering Committee decide whether or not to proceed to the next stage. The NPD Team consists of either Topwood's or Metbuild's Head of Operations, laboratory personnel, technical and production personnel, MMD sales and marketing personnel, university researchers and perhaps some customer representation, while the Steering Committee comprises the Magma group senior management team from across the divisions (5.4).

While a formal process, stage-gate control and a cross-functional approach are evident in both Topwood and Metbuild, differences emerge in the impact they have on the participants in NPD in each company. The formal NPD process is regarded in both companies as a necessary means by which to organise and structure the development of new products, but the stage-gates are perceived by the managers in Topwood to be comparatively more restrictive and dominating. Topwood's Head of Operations describes how the burden to furnish Magma with information at stage-gate reviews slows the process down while the information itself, particularly the accounting information, is considered to ignore important aspects of the project (6.3.3). Similar concerns are not evident in Metbuild. Cross-functional collaboration during NPD is again clearly evident in both companies, but to greater effect in Metbuild where cross-functional managers have interacted and collaborated with each other to such an extent that their world views and general perspectives have become closely aligned (7.3.1).

Each manager's engagement with these aspects of NPD is informed by that manager's internal perspective. This internal perspective is shaped by the manager's lived experiences. For instance, Topwood's Head of Operations views the stage-gate reviews as a burden which slows NPD down. He associates these reviews with Magma who he perceives as a constraining influence which is attempting to control his NPD activities. This is in direct conflict with his dispositional commitment to innovation (6.3).

Each manager presented in Chapter Six engages with the NPD process and its various participants in different ways and his actions throughout the process are guided by the combination of his lived experiences with the institutionalised structures surrounding NPD. This is important because it recognises the importance of agency as well as structure in influencing behaviour. An institutional perspective would explore how the institutionalised rules and routines associated with a formal, cross-functional NPD process governed by stage-gate control influence NPD. The structuration perspective adopted in this study recognises, not only the importance of human agency in conjunction with these institutionalised rules and routines, but the complex issues which influence human agency. NPD is impacted by a combination of a variety of factors in conjunction with the individuals involved. Those individuals bring with them all of their world-views, cultural schemas and connotation of discourse as well as the rules and normative expectations associated with their specific roles in NPD.

8.5.2 Accounting information and the formal NPD process

Within the formal NPD process some accounting information is reviewed in the early stages but it is most prominent during the Business Analysis stage when the Finance function presents the Steering Committee with a comprehensive business case for the product. Business Analysis is the final stage before the significant commitment of financial resources to the project (5.4). As the formal process has evolved this stage has moved further downstream (5.5). Accounting information reviewed as part of the formal NPD process consists of carefully aggregated pro-forma schedules of accounting information prepared, and most importantly presented to the Steering Committee, by the Finance function (5.4.1, 5.5.1).

As set out in Chapter Two, empirical literature examining the role of the Finance function and accounting information in NPD is conflicting. One body of literature reveals proactive accounting support for NPD with the Finance function effectively integrating financial and non-financial information in such a way as to encourage innovation, whilst simultaneously exercising control (Hertenstein and Platt, 1998; Nixon, 1998; Gleadle, 1999). A second body of literature describes Finance as relatively ancillary to NPD, with the most meaningful contribution coming at the Business Analysis phase (Rabino, 2001; Hughes and Pierce, 2006).

In the context of the formally documented NPD process this study's findings are consistent with the latter. Within this formal process, accounting information is not shaping new product design or informing decisions at the early fluid stages of the project. These decisions are made based on other information. During the Business Analysis stage of the formal process, the new product is scrutinised based on specific financial criteria. Accounting information is relied upon to financially validate earlier product design decisions (7.5.1.1). In this context, accounting information is being used for its traditional purposes of monitoring and scorekeeping (2.5). The formal NPD process and the accounting information reviewed therein provide the Steering Committee with a system of routines from which members of the Steering Committee draw ontological security with regard to NPD. In section 7.2.4 the Head of MMD describes his preference to have accounting information 'blessed' by someone in Finance, while Metbuild's Head of Operations suggests that accounting information is considered more credible if it is delivered by a member of Finance. In relying on the Finance function to present this information, members of the Steering Committee are drawing further ontological security from the recognisable behaviour and routinised procedures associated with the Finance function (7.2.1).

8.5.3 Accounting information in the wider NPD environment

The use of accounting information during NPD is not limited to the formal NPD process. Members of the NPD Team use accounting information on an informal basis to deliberate over issues from the very outset of NPD, often before the formal process has even begun. In this informal context accounting information is regarded as a

‘taken-for-granted’ language, used by managers almost intuitively throughout NPD (5.7).

When using accounting information informally at the earlier stages of the process, managers are drawing on their internal structures of signification whereby they are using accounting information to understand the implications of their product design decisions. Once the project progresses and accounting information is used to gain stage-gate approval for a new product project, managers are drawing on their internal structures of legitimation and domination whereby they are using accounting information to justify their behaviour and seek approval from the Steering Committee. The structural interactions which take place when accounting information is used are examined in more detail in section 8.5.5, but it is important to note the differences in internal knowledgeability informing accounting information use in a formal or informal context.

The informal use of accounting information reflects a decentralisation of accounting information, which is more evident in Metbuild than it is in Topwood. The decentralisation of accounting information evident in the findings is important for a number of reasons. It enhances our insight into reports in the literature of the evolution of the management accountant’s role from a bean-counter into a type of hybrid accountant or business partner (2.5). If an accountant is to adopt a wider, more commercially informed role, he or she must first let go of their traditional hold over accounting information. This is particularly evident in Metbuild where the Head of Finance is successfully balancing the conflicting accounting information demands on the contemporary hybrid accountant or business partner. He is achieving this primarily by facilitating the decentralisation of accounting information and empowering the rest of the company with strong financial know-how. In section 6.6.1 Metbuild’s Head of Operations describes the high quality accounting information available to management which has the effect that people are always aware of the impact of their decisions. This lightens the accountant’s workload in terms of day-to-day accounting information support, and makes the stewardship aspect of his role easier because he is dealing with more financially literate individuals. Topwood’s Head of Finance is attempting to decentralise accounting information but with less success, with the result that there is no evidence of any expansion of his role (7.5.1.3).

Topwood's Head of Operations (Jack) expresses a desire for an accountant who 'speaks a common language' and 'who is on my side' (6.3.2). This suggests that Jack is not confident in dealing with accounting information and does not perceive the accountant to be a partner. This illustrates the extent to which a broadening of the accountant's role into that of a business partner is associated with the effective decentralisation of accounting information.

However, the findings suggest that the decentralisation of accounting information, and the expansion in the accountant's role resulting from it, is not just a function of the accountant's abilities. Managers in Metbuild were more receptive to the decentralisation of accounting information than their Topwood counterparts. These differences are the combined outcome of a multitude of structuration processes occurring in each company over time. For instance, managers in each company have clearly had contrasting experiences with the parent company Magma (7.2.6). These contrasting experiences have shaped the dispositional perspectives of managers in both companies, rendering the managers in Metbuild more positive in their attitude to accounting information than those in Topwood (7.5.2.1). Managers in Metbuild face less of an internal negotiation between their personal values and dispositions and their conjuncturally specific internal structures when engaging with accounting information. Meanwhile, managers in Topwood continue to feel constrained by the conjunctural sanctions imposed by accounting information (7.5.2.2). The contrasting internal structures amongst the managers in both companies are further compounded by the fact that each company has a different type of Managing Director at the helm. Topwood's Managing Director is focused on the Steering Committee and considers accounting to be largely ancillary to decision-making. Metbuild's Managing Director is more closely involved with the company's NPD Team and considers accounting information to be intrinsic to all decision-making (7.5.2.3). The ongoing interactions of all of these structures, both internal and external, resulted in managers in Metbuild being comparatively more receptive to the accountant's efforts to decentralise accounting information.

8.5.4 Accounting information as an external structure

The findings raise inevitable questions regarding the extent to which accounting information can serve such vastly different purposes throughout NPD. In a formal context it is relied upon by the Steering Committee to make stage-gate decisions toward the end of the process, providing them with a degree of comfort and security with regard to their NPD investments, particularly when provided by the Finance function (8.5.2). In an informal context it is used in improvised, unpredictable circumstances as members of the NPD Team draw on it to inform day-to-day NPD decisions in the early fluid stages of the project (8.5.3).

As discussed in section 7.5.1.2 the contrasts in these very different incarnations of accounting information are best explained by conceptualising accounting information as an external structure within a structuration process. Fundamentally, accounting information consists of stocks of data comprising identifiable conventions and codes which are largely familiar to everyone within the organisation. These external structures of accounting information are comprised of accepted accounting concepts such as revenue, cost, profit, loss, return and investment. How an individual engages with this external structure, whether in a formal or informal context, depends on that individual's internal structures. These might include their dispositional attitude to accounting resulting from their educational background (e.g. Both Heads of Finance demonstrate a dispositional commitment to accounting arising from their education and training as accountants, refer to Sections 6.4.1 and 6.7.1). Or it might include their conjunctural relationship with accounting resulting from their role in the organisation (e.g. Topwood's Head of Operations is conjuncturally constrained by accounting information because it he feels it conflicts with a critical aspect of his job, that is to develop new products, refer to Section 6.3.2). As a result, whether accounting information is used formally or informally throughout NPD is an outcome of the interaction between these basic external structures of accounting information and a manager's own internal structures.

This aspect of the findings enhances our understanding of external structures in Structuration Theory and this is discussed in section 8.6.3. Beyond that it provides a clear illustration of how elements of both determinism and voluntarism are critical in understanding how managers use accounting information during NPD (7.2.2). Whether accounting information is used in a formal or informal capacity is a function of the individuals using it. These individuals have different objectives, motivations, attitudes and outlooks and this has as much influence on the use of accounting information throughout NPD as the information itself. Not only does this explain how accounting information can have such different incarnations within one environment, it goes some way toward explaining the conflicts in the empirical literature between that which describes accounting as having only an ancillary involvement in NPD and that which describes proactive accounting support for NPD.

8.5.5 Interactions between structures

Stones' quadripartite cycle of structuration addresses some of the weaknesses of Giddens' original model, specifically developing Structuration Theory so that it can be used to guide empirical research in specific contexts (3.4). However, Stones' model has itself been criticised for its lack of emphasis on the interaction between structures and how this interaction is implicated in their ultimate modification. Using Stones' composite research strategy, it was possible to regard NPD in MMD as a social system through which we could develop an understanding of the cluster of agents involved, examine those agents' structures both internal and external, and explore how these structures interacted with each other and ultimately how they were formed, reformed or modified through the action of these agents (7.5). What resulted from this composite research strategy were the six micro-analyses presented in Chapter Six. Some of the most compelling examples of modifications observed in these micro-analyses are set out below.

The findings reveal that the managers' dispositional frames of meaning are shaped by their structural conditions of action. A key element of these managers' conditions of action is their parent company Magma. The managers' contrasting dispositional perspectives are associated, to some extent, with their contrasting experiences with Magma. Topwood has an ageing plant, has received little or no investment from

Magma and offers an inflexible and over-commoditised product range. In contrast, Magma has invested heavily in Metbuild allowing it to broaden its product range and de-commoditise its product offering. Given each company's different experiences with Magma, it is not surprising that there are such contrasts in their attitudes to their parent company. These findings demonstrate how these contrasting attitudes are implicated in their use of accounting information. The managers' contrasting experiences with Magma as an external structure have shaped their differing dispositional frames of meaning, from which they draw on different conjuncturely specific internal structures, the combination of which impacts on their use of accounting information (7.5.2.1).

The Managing Directors provide an interesting illustration of the interacting and overlapping nature of internal and external structures when examining a number of agents within a given conjuncture. As described in section 6.8, John was involved in the initial setting up of Metbuild during which he worked with a small management team to ensure the company's survival. His ideological schema is embedded in Metbuild and its success. As set out in section 6.5, Nick joined Topwood as an engineering graduate, quickly working his way up to Managing Director. His ideological schema is embedded in Magma's corporate success. John's and Nick's own lived experiences have clearly shaped their dispositional perspectives, but critically, as agents-in-context they have gone on to influence the dispositional frame of the other agents-in-focus in Metbuild and Topwood respectively (7.5.2.3).

Interactions within internal structures are just as important as those interactions between internal and external structures. All three of Metbuild's agents-in-focus demonstrate an overriding commitment to profitability and financial accountability while in Topwood, the dispositional perspectives of agents-in-focus are more closely aligned with their individual functions. This is particularly evident in the contrast between the Heads of Operations in each company. In Metbuild, Pete's dispositional frame is embedded in Metbuild's financial performance. From within this dispositional frame he draws on accounting information on an informal basis to make decisions throughout the NPD process. In Topwood, Jack demonstrates a strong dispositional commitment to innovation and technical advancement which he feels is constrained by the conjuncturely specific sanctions imposed by the accounting

information reviewed by the Steering Committee. There is an ongoing internal negotiation between these agents' dispositional perspectives and conjuncturally specific internal structures. Jack's dispositional and conjunctural internal structures are in conflict, with the result that he perceives accounting information as an imposing and constraining influence. Pete's dispositional and conjunctural internal structures are less conflicted, meaning that he perceives accounting information as an enabling and supportive tool. This illustrates how the degree of conflict between these agents' dispositional frames of meaning and conjuncturally specific internal structures is associated with their respective use of accounting information (7.5.2.2).

The findings also provide insight into the impact of interactions between external structures. Changes in the formal NPD process have had clear implications for accounting information in this formal context, pushing it further downstream and reinforcing the sense that in a formal context accounting information is about legitimising decisions already taken (7.5.1.1). Metbuild's Head of Finance has been more successful than his Topwood counterpart in empowering his colleagues with financial know-how. This has resulted in the Metbuild managers engaging with accounting information on a day-to-day, informal basis to a greater extent than their Topwood colleagues (7.5.1.3).

Whether accounting information is used in a formal or informal context is itself an outcome of structuration (8.5.4). However, the findings suggest that one can influence the other. The use of informal accounting information in Metbuild facilitates day-to-day dialogue between cross-functional managers using an accounting-based vernacular. In section 7.3.2, Metbuild's Managing Director suggests that the high quality of accounting information available to the NPD Team means that there are no surprises when a project is subjected to financial scrutiny in the latter stages of the NPD process. In this way, the managers' engagement with accounting information on an informal basis makes them more receptive to it when they must engage with it in a formal context (7.5.1.2). In contrast, Topwood's Head of Operations is less comfortable with accounting information in the earlier stages of NPD. He is not empowered with strong financial know-how and suggests that it would be helpful if the NPD Team were involved at the outset in a helpful and participative manner. His attitude to accounting information when a project is subject to financial scrutiny within the formal process is far less positive than his colleagues in Metbuild and he

blames Finance for this, describing them as ‘control freaks’ and ‘snipers’ who ‘pick people off along the way’ (7.5.1.3).

It is the interactions between structures, both internal and external, which provide depth of insight into the managers’ behaviour. These interactions are ongoing and iterative with the result that accounting information and its role in NPD always has the potential to evolve and transform.

8.6 CONTRIBUTIONS OF THE STUDY

8.6.1 Contribution to methodology

It is clear from these findings that the managers’ use of accounting information is determined as much by the subjective nature of the managers themselves as it is by the objective characteristics of the structures with which they interact. In this way, the findings contribute to the subjective-objective debate discussed in section 4.3.4. This insight is achieved because of the way in which Structuration Theory is operationalised in a case study setting using six individual agents-in-focus, facilitating a micro-analysis of each agent’s process of structuration as well as an exploration of the web-like interdependencies between different agents’ processes of structuration.

Giddens’ structuration model was criticised for being a meta-theory or ‘a way of thinking about the world’ as opposed to a framework to guide empirical research (3.3). Giddens’ model relied on the concept of methodological bracketing, originally introduced in order to operationalise Structuration Theory as a framework for research. Critics accused Giddens’ of pushing the bracketing too far however, effectively re-introducing the dualism which Structuration Theory was intended to eradicate in the first place (3.4). Stones’ model was designed to specifically address this weakness in Giddens’ original structuration construct. Stones presented a composite research strategy as a tool to assist in the application of his strong structuration model in empirical settings. Stones’ research strategy informed the study’s data collection which was carried out on an iterative basis in conjunction with ongoing consultation with the literature in this area. In this way, this study responds to

a direct call from Jack and Kholeif (2007) to introduce Stones' model at the research design stage. In operationalising Structuration Theory in a way that few studies have to date the findings demonstrate the potential for Structuration Theory to guide future empirical research.

By illustrating the inseparability²⁷ of the agent from the structure the findings contribute to our understanding of Structuration Theory at an ontological level. However, they go further, responding to a direct call in the literature to examine the relationship between structures, both internal and external (3.5.1), thereby enhancing our understanding of Structuration Theory at a methodological level. By using Stones' composite research strategy, which encourages us to conceive of internal structures as always looking outwards and external structures as always looking inwards, the findings help us to understand the 'connecting tissue' between the different elements of the quadripartite of structuration which has been lacking in previous research in the area (Coad and Herbert, 2010). This understanding of the connecting tissue between structures was facilitated by the micro-analysis of six managers within a given conjuncture. Using the concept of the agent-in-focus as a tool with which to switch lenses from manager to manager acknowledged the web-like interdependencies between different processes of structuration. This allowed an exploration of the relationships between the various agents and structures.

8.6.2 Contribution to Structuration Theory

By conceptualising accounting information as an external structure, the study develops Stones' model by providing an enhanced insight into issues of freedom, choice and determination within external structures while at the same time illustrating the duality of structure at play. In providing the managers with their conditions of action, accounting information is identified as a key external structure in this study. How these external structures manifest in the managers' day to day environment is an outcome of the interaction of these external structures with the managers' individual internal structures. This illustrates the duality of structure. External structures of accounting information are, in themselves, both the medium and outcome of social

²⁷ Inseparability in this context refers to the concept that agency and structure are intrinsically bound through their interaction with each other.

interaction. They condition the agent's behaviour and when combined with an agent's internal structures they manifest as structural outcomes in the form of formal or informal accounting information.

Stones' model paid particular attention to the nature of the autonomy of external structures. He describes independent causal influences as those which are entirely outside of the control of the agent, while an agent's ability to control an irresistible causal force is bound up in that agent's own wants, desires, attachments, dispositions, orientations and bonds (3.4.2). Stones' conceptualisation of independent causal forces implies a total absence of control by the agent while his conceptualisation of irresistible causal forces implies that the agent has some control, the extent of which depends on the agent's internal structures. Stones suggests that all external structures fall into one of these two categories which are distinguished in absolute terms by the absence or presence of control by the agent. These findings suggest that this is an over-simplified way of examining external structures.

External structures of accounting information can manifest itself in a formal or informal context. The distinction between formal and informal accounting information is associated with the degree of control managers themselves have over external structures of accounting information. Accounting information in a formal context is tied into the formal NPD process. It is somewhat independent of the agent and is relatively generic and homogenous from project to project. In contrast, accounting information used on an informal basis during NPD is fluid and dynamic, evolving on a day to day basis, shaped and moulded to individual managers in particular circumstances as a result of the interaction of their internal and external structures. While the former emphasises the structural element of the duality of structure and the latter emphasises the agency aspect, they are not clearly distinguishable by the presence or absence of control, but by degrees of control. In this sense external structures of accounting information have an element of independence and irresistibility. This suggests that the distinction between independent and irresistible causal forces is not clearcut.

8.6.3 Contribution to empirical literature

8.6.3.1 Accounting and New Product Development

The literature review presented in Chapter Two confirms that empirical research examining the role of accounting information in NPD is scarce and what did exist is somewhat conflicting. One stream of literature reports that financial involvement in NPD is restricted largely to feasibility analysis and business case development (Rabino, 2001; Hughes and Pierce, 2006; Trueman and Pike, 2006). An opposing stream describes proactive accounting support for NPD (Hertenstein and Platt, 1998; Nixon, 1998; Gleadle, 1999). As described in section 8.5.4, these findings corroborate both streams of literature and in doing so provides a connecting tissue between the two. By conceptualising accounting information as an external structure and examining the use of accounting information as an outcome of structuration, the findings explain how accounting information can serve such vastly different purposes in a given context. External structures of accounting information consist of accepted and recognisable principles and terms such as revenue, cost, profits and investment. How an individual engages with those external structures, whether that is to review a business case in the latter stages of the formal process, or inform a product design decision in the early fluid stages of NPD, depends on the interaction of those external structures with the user's internal structures. In this way the use of accounting information is intrinsically tied to the varying objectives, motivations, attitudes and outlooks of different users. This is reflected in the contrasting accounts in the literature of accounting information use during NPD.

8.6.3.2 Strategic Management Accounting

As set out in Chapter 2, empirical evidence suggests low implementation rates of SMA techniques, despite what appears to be an increasing demand for more strategically relevant accounting information (2.3.2). It has been suggested in the literature that while SMA techniques in the normative sense are not being widely adopted, underlying aspects of SMA are influencing the thinking and language of business (Langfield-Smith, 2008). While these findings provide no evidence that

specific SMA techniques are being used in the case-site, they do provide evidence of accounting information being reviewed in a strategic context. The informal use of accounting information by members of the NPD Team, particularly in Metbuild, is described by managers as a 'taken for granted' language which drives NPD, especially at the early fluid stages of a product's development (5.7). This implies a strategic orientation to the preparation and use of accounting information which certainly reflects some of the key principles underlying SMA.

Furthermore, accounting information in this context is being used by members of the NPD Team, these are individuals outside of the Finance function. This is consistent with reports in the literature that a significant feature of the contemporary incarnation of SMA as reported in the literature is the extent to which it has crossed boundaries into other management disciplines (Anderson, 2007; Bhimani and Langfield-Smith, 2007). These findings suggest that the strategic orientation of accounting information is not necessarily managed or owned by accountants, but by members of the NPD Team. The challenge facing the accountant is in equipping the members of the NPD Team with the requisite know-how to use accounting information in this context.

8.6.3.3 The changing role of the Finance function

As set out in Chapter Two, developments in the business environment are believed to have influenced change in the role of the Finance function, with the result that today's accountant is expected to move away from the traditional number crunching role to that of a strategically focused financial advisor. Empirical accounts of the contemporary role of the accountant are still contradictory, with some indicating a broadening of the accountant role while others suggest that the role of the accountant is still primarily that of a scorekeeper (2.5).

The findings with regard to Metbuild's Head of Finance, Des, are consistent with empirical accounts of the 'hybrid accountant' who combines an increased involvement in business processes with a more traditional monitoring and control role (Caglio, 2003; Burns and Balvinsdottir, 2005 and De Loo *et al*, 2011). Des successfully balances the conflicting accounting information demands of the NPD Team who require support in preparing accounting information which shapes plans and

influences design, and the Steering Committee who require information which allows them to monitor NPD progress and make stage-gate decisions. In this capacity Des is demonstrating a broadening of the accountant's role with an increased emphasis on interacting with people throughout the organisation, which is in keeping with the literature (Siegel and Sorensen, 1999; Burns and Scapens, 2000; Burns and Yazdifar, 2001; Yazdifar and Tsamenyi, 2005; Byrne and Pierce, 2007; Järvenpää, 2007; Bhimani and Bromwich, 2010).

This hybrid role is less evident in Topwood, where the Head of Finance, Paul, is relied upon predominantly for scorekeeping and internally oriented activities. This is consistent with empirical accounts suggesting that the accountant's role has not expanded significantly (Burns and Vaivio, 2001; Verstegen *et al*, 2007; Zoni and Merchant, 2007).

Much of the contradictions in the empirical literature addressing the role of the accountant is addressed by taking a contingent perspective, which suggests that the accountant's role varies from circumstance to circumstance, influenced by a variety of contextual factors (Gerdin and Greve, 2004; Feeney, 2006; Byrne and Pierce, 2007). The manner in which the study's findings contribute to this literature is outlined in the next section.

8.6.3.4 Beyond contingency theory

For many years contingency theory has been used to identify contextual variables which are implicated in the design and use of accounting information systems (2.5.1). This study's findings contribute to that literature by exploring how contextual variables impact on accounting information use.

The findings demonstrate how external structures, often contextual factors in the agent's environment, shape an agent's internal structures and the combination of these external and internal structures informs his action. This responds directly to Chenhall's (2003) call to start considering the structural relations between variables in contingency-based research. He proposes a research agenda which considers, amongst

other things, the sociological processes affecting accounting information systems in action.

This study's exploration of accounting information as a social phenomenon reveals it to have a complex relationship with the managers who use it. Using Structuration Theory as a theoretical lens, the findings demonstrate how an individual manager's use of accounting information is an outcome of structuration and depends on the interaction of that manager with their conditions of action. External structures provide an agent with his conditions of action (7.2). Internal structures are those aspects of an agent himself which influences his behaviour (7.3). An understanding of these external and internal structures gives meaning to individual action, specifically how the interactions between these external and internal structures are implicated in the role of accounting information in NPD (7.4). The duality of structure is evident in the modified structures, both external and internal, which result from this action (7.5). For many years, contingency theory has been used to understand the relationship between aspects of the contextual environment and the design and use of accounting information systems (2.5.1). Contingency theory stems from the proposition that most events and the outcomes of those events are likely to depend on conditional circumstances and it has been heavily relied upon in the literature to establish the link between accounting information and those conditional circumstances (Chenhall, 2003). Structuration Theory goes beyond contingency theory by establishing the link between accounting information and the individuals using it, while recognising that those individuals are affected by their conditional circumstances.

8.6.4 Contribution to practice

This study's theoretical foundation facilitated a depth of insight into the sociological implications of accounting information use which highlights a number of important practical issues for accountants, managers and senior management.

8.6.4.1 Implications for accountants

The findings describe how MMD's NPD process has evolved. The Business Analysis stage has moved further downstream with the result that formal accounting information is being relied on later in the process (7.5.1.1). This has implications for accountants in terms of limiting their formal engagement with NPD. If accountants are to contribute to NPD in a meaningful way from early in a new product's development they must successfully balance the often conflicting accounting information demands of its various users. This requires the accountant to effectively empower the rest of the company with financial know-how such that they can use accounting information themselves on a daily basis, whilst simultaneously furnishing senior management with the type of structured, aggregated accounting information from which they draw ontological security when financially scrutinising new product projects. The findings suggest that it is the empowerment of the rest of company with financial knowhow which presents the most challenge to accountants. As discussed throughout sections 8.5 and 8.6 this is not completely within the control of the accountant, a combination of factors must be in place, but it is entirely impossible if the accountant does not loosen his reigns on the accounting information and fully commit to educating the rest of the company in how to use it.

The Heads of Finance in Topwood and Metbuild have had different degrees of success in this regard and this could be attributed to differences in approach between the two. On paper, both accountants are very similar in terms of education, training and experience. They appear to approach their jobs in a very similar way, both having made specific reference to the necessity to decentralise accounting information and empower everybody in the company with financial knowhow. However, an examination of the more nuanced aspects of their approach reveals subtle differences. In Metbuild, Des, refers to the need to ensure that everyone is 'talking the same language' and that 'nothing is getting lost in translation' (6.7.2) while in Topwood, Paul, describes having spent '10 years beating it [financial understanding] into them' (6.4.3). Des is a partner, an enabling and supportive external structure from the perspective of the managers using the information. Paul is less so, appearing to have made far less effort to effectively empower the managers in Topwood and as a result is less involved in NPD (7.5.1.3).

Des has expanded his role in NPD. This is evident in his increased involvement in the *EBuild* project (5.5.1). In doing so Des has broadened his role, developed his business understanding and, critically, enhanced his social competencies, all three of which are aspects of Des' performance which are highlighted by the other agents-in-focus in Metbuild (refer to Section 6.6.3 and 6.8.3). Des is effectively performing the Business Partner role much discussed in the literature (2.5). The findings suggest that an effective cultivation of the Business Partner role goes hand in hand with the decentralisation of accounting information which requires total commitment by the accountant.

8.6.4.2 Implications for managers

'Managers' in this context refers to users of accounting information throughout the organisation.

Section 8.7.1 describes the obligations on the accountant to enhance the role of accounting information in NPD but it is clear from the findings that this is not entirely within the control of the accountant. The managers themselves must be willing to engage with accounting information in a broader sense than they might have traditionally. Metbuild's Head of Operations describes the availability of costing models which allow him to perform 'what if' analyses at the very early stages of the process (6.6.3). This suggests that Pete is engaging with accounting information and learning how to use it. Topwood's Head of Operations expresses a desire for an accountant to be involved earlier in the process who is 'on [his] side, fighting [his] battles' (6.3.2). This suggests that Jack wants the accountant to take responsibility for enhancing the role of accounting information at the earlier stages of the process. The contrasts between Pete and Jack and the structuration processes associated with these contrasts have been examined at length throughout this study but the net effect of their contrasting processes of structuration are that Pete engages with accounting information at the earlier stages of NPD to a greater extent than his counterpart Jack. This illustrates the obligations of users in terms of enhancing the role of accounting information in NPD, but as demonstrated throughout this study, users will be more or less motivated to do this depending on their own internal structures.

8.6.4.3 Implications for senior management

‘Senior management’ in this context refers to those at senior levels in the organisation who have a role to play in terms of influencing organisational culture.

Each manager’s use of accounting information is intrinsically tied to his objectives, motivations, attitudes and outlooks. These findings have demonstrated how his willingness to engage with accounting information in a broader capacity will be informed by a multitude of structural outcomes. In this sense, it cannot be attributed to any one factor but to a combination of factors all working together. As discussed in section 8.5.4 this is evident in Metbuild where the combined outcome of a multitude of structuration processes throughout the company meant that the managers were receptive to the decentralisation of accounting information.

It is very clear from the findings that Metbuild’s Managing Director (John) is very amenable to accounting information, influenced by his involvement with Metbuild as a start-up company during which time he was a member of a small management team, which included an accountant, all of whom worked together to ensure the company’s survival. The interactive and overlapping nature of structuration means that John’s dispositional perspective went on to influence the other agents-in-focus in Metbuild which had implications for how they perceived their external terrain including accounting information, Magma and the NPD process (7.5.2.3). John set a tone which influenced a multitude of structuration processes and consequently permeated the company. There was no evidence of John’s counterpart in Topwood setting a similar tone.

This is not to suggest that the actions of senior management alone can result in the successful decentralisation of accounting information but it does suggest that if managers are to be receptive to it, senior management have a role to play in terms of setting the tone at the top and contributing to the conditions which facilitate the decentralisation of accounting information. The actions of senior management can inform the dispositional schema from which managers’ draw on their conjunctural internal structures through which they perceive their external terrain.

8.7 LIMITATIONS

The key findings, conclusions and contributions of the study must be interpreted in light of the limitations of the study. The findings emerge from an interpretative case study which by its very nature has inherent limitations. The extent to which it is possible to draw wider generalisations from the research is limited. The findings provide insights into the interactions between internal and external structures within the NPD environment of MMD. It is not possible to determine the extent to which such findings would be replicated elsewhere. However, the objective of the study was never to offer empirical generalisations but to develop an in-depth understanding of managers' behaviour during NPD. This might serve to enhance our understanding of similar processes in other contexts and settings but such generalisations could not be statistically inferred.

A case study approach has the limitation that the lack of anonymity may result in bias arising from the interviewee's reluctance to confess to any personal experiences which may reflect badly on them. However, the managers were guaranteed their anonymity and appeared to speak freely during the interviews.

Qualitative data gathering and analysis inevitably results in the use of some judgement and subjectivity. Case study methods in particular have been challenged for their susceptibility to interview bias, the reliability of documentation and the researcher's own definition of the boundaries of research design (Yin, 2009). It is impossible to completely eliminate these limitations but they were addressed by the researcher in the context of rigorous research design which is documented in Chapter Four.

Stone's quadripartite model of structuration as well as the composite research strategy he puts forward as a methodological tool to accompany it is relatively new in the literature, its most significant publication occurring in 2005. It was adopted as a means of analysis once all of the data in this study were gathered. The researcher's understanding of the strategy developed as the analysis progressed.

8.8 FUTURE RESEARCH

A number of directions for future research emerge from the findings, conclusions, and limitations of the current study.

The role of accounting in NPD has not been widely researched and is under-developed theoretically. One of this study's most significant contributions is the presentation of a theoretical lens through which to examine the issue. More research is needed in order to develop a better understanding of how accounting is used to support innovation and NPD in organisations. These findings suggest that this might be best achieved through further exploration of the sociological implications of accounting information use in an NPD context.

Much has been written about the decentralisation of accounting information and the impact this might have on accountants. Questions have been raised as to whether it solidifies their role as nothing more than corporate cops (Siegel, 2005), forces them to reposition their role into that of a business partner (Burns and Balvinsdottir, 2005) or renders the role of the management accountant increasingly redundant (Pierce, 2001). These findings reveal that managers are using accounting information in a way that is far less formal and more improvised than much of what has been reported in the literature. More insight is needed into this increasingly informal manifestation of accounting information, including an understanding of the relationship between this and accounting information relied upon in a more formal capacity as illustrated in this case. This suggests that the timing is appropriate to specifically study the implications of the decentralisation of accounting information, in particular the sociological implications, moving beyond the boundaries of the Finance function into the wider organisation.

The findings begin to explore the organisational conditions which are associated with a successful business partner role. The skills and competencies of the accountant, though important, are not the only determinants of an effective business partner.

An open and collaborative Finance function will not guarantee that an accountant will be an effective business partner. The managers dispersed throughout the organisation must be accepting of the accountant's enhanced role which requires them to become financially knowledgeable themselves. Future research must explore the role of the business partner, particularly in a sociological context, and examine what the business partner role really means today.

Structuration Theory has potential for supporting future research into the role of accounting information in innovation and NPD, the decentralisation of accounting information and the role of the business partner. Future research in this regard would benefit from more depth of understanding of the composite research strategy. In addition, an enhanced understanding of both external and internal structures is required and this is achievable by focusing on how they interact with each other. The literature would benefit from a greater understanding of the autonomous nature of external structures. This study's conceptualisation of accounting information as an external structure provided some insights into the complexities surrounding freedom and choice with regard to external structures but more understanding is required in this area.

BIBLIOGRAPHY

Abernethy, M.A., Chua, W., Lockett, P.F. and Selto, F.H. (1999) 'Research in managerial accounting: Learning from others' experiences', *Accounting and Finance*, vol. 39, no. 1, pp. 1-27.

Accola, W.L. (1994) 'Assessing risk and uncertainty in new technology investments', *Accounting Horizons*, vol. 8, no. 3, pp. 19-35.

Ahrens, T. (2004) 'Refining research questions in the course of negotiating access for field work' in C. Humphrey and B. Lee (eds), *The Real Life Guide to Accounting Research: A Behind the Scenes View of Using Qualitative Research Methods*, London: Elsevier, pp. 295-307.

Ahrens, T. (2008) 'Overcoming the subjective-objective divide in interpretive management accounting research', *Accounting, Organisations and Society*, vol. 33, no. 2-3, pp. 292-297.

Ahrens, T. and Chapman, C. (2002) 'The structuration of legitimate performance measures and management: day-to-day contests of accountability in a U.K. restaurant chain', *Management Accounting Research*, vol. 13, no. 2, pp. 151-171.

Ahrens, T. and Chapman, C. (2006) 'Doing qualitative field research in management accounting: Positioning data to contribute to theory', *Accounting, Organisations and Society*, vol. 31, no. 8, pp. 819-841.

Albright, T. and Lam, M. (2006) 'Managerial Accounting and Continuous Improvement Initiatives: A Retrospective and Framework', *Journal of Managerial Issues*, vol. 18, no. 2, pp. 157-174.

Anderson, S. W. (2007) 'Managing costs and cost structures throughout the value chain: research on strategic cost management' in Chapman, C.S., Hopwood, A.G. and Shields, M.D. (Eds.) *Handbook of Management Accounting Research*, vol. 2, Elsevier, Oxford, pp. 451-506.

Anderson, S.W. and Sedatole, K. (1998) 'Designing quality into products: The use of accounting data in new product development', *Accounting Horizons*, vol. 12, no. 3, pp. 213-233.

Archer, M. (1982) 'Morphogenesis versus structuration', *British Journal of Sociology*, vol. 33, pp.455-483.

Archer, M. (1988) *Culture and Agency: The Place of Culture in Social Theory*, Cambridge: Cambridge University Press.

Archer, M. (1995) *Realist Social Theory: the Morphogenetic Approach*, Cambridge: Cambridge University Press.

Archer, M. (1996) 'Social integration and system integration: developing the distinction', *Sociology*, vol. 30, no. 4, pp. 679-699.

Archer, M. (2000) *Being Human; The Problem of Agency*, Cambridge: Cambridge University Press.

Archer, M. (2003) *Structure, Agency and the Internal Conversation*, Cambridge: Cambridge University Press.

Ashford, R. W., Dyson, R. G. and Hodges, S. D. (1988) 'The capital-investment appraisal of new technology: problems, misconceptions and research directions', *The Journal of the Operational Research Society*, Vol. 39, No. 7, pp. 637-642.

Atuahene-Gima, K. (1995) 'An exploratory analysis of the impact of market orientation on new product performance', *Journal of Product Innovation Management*, vol. 12, no. 4, pp. 275-293.

Banks, R.L. and Wheelwright, S.C. (1979) 'Operation vs. strategy: trading tomorrow for today', *Harvard Business Review*, vol. 57, no. 3, pp. 112-120.

Bauman, Z. (1989) 'Hermeneutics and modern social theory', in D Held and J.B. Thompson (eds), *Social Theory of Modern Societies: Anthony Giddens and his Critics*, Cambridge: Cambridge University Press.

Baxter, J.A. and Chua, W.F. (1998) 'Doing field research: practice and meta-theory in counterpoint', *Journal of Management Accounting Research*, vol. 10, pp. 69-87.

Baxter, J. and Chua, W.F. (2003) 'Alternative management accounting research—whence and whither', *Accounting, Organisations and Society*, vol. 28, no. 2-3, pp. 97-126.

Bazeley, P. (2007) *Qualitative Data Analysis with NVivo*, London: Sage.

Belkaoui, A. (1980) *Conceptual Foundations of Management Accounting*. Don Mills Ontario: Addison-Wesley Publishing Company.

Berliner, C. and Brimson, J.A. (1988) *Cost Management for Today's Advanced Manufacturing: the CAM-I Conceptual Design*, Harvard Business School Press, Boston, Mass.

Berry, A.J., Capps, T., Cooper, D., Ferguson, P., Hopper, T. and Lowe, E.A. (1985) 'Management control in an area of the NCB: Rationales of accounting practices in a public enterprise', *Accounting, Organisations and Society*, vol. 10, no. 1, pp. 3-28.

Berry, A. J. and Otley, D. (2004) 'Case-based research in accounting', in C. Humphrey and B. Lee (eds), *The Real Life Guide to Accounting Research: A Behind the Scenes View of Using Qualitative Research Methods*, London: Elsevier, pp.231-255.

Bhaskar, R. (1979) *The Possibility of Naturalism: A Philosophical Critique of the Contemporary Human Sciences*, Harvester Press, Brighton, Sussex.

Bhimani, A. and Bromwich, M. (2010) *Management accounting: retrospect and prospect*, 1st edition, Oxford: CIMA.

Bhimani, A. and Langfield-Smith, K. (2007) 'Structure, formality and the importance of financial and non-financial information in strategy development and implementation' *Management Accounting Research*, vol. 18, no. 1, pp. 3-31.

Bhimani, A. and Roberts, H. (2004) 'Management accounting and knowledge management: in search of intelligibility', *Management Accounting Research*, vol. 15, no. 1, pp. 1-4.

Blocher, E.J., Stout, D. E. and Cokins, G. and Linn, T. (2005) *Cost Management: A Strategic Emphasis*, 4th edition, London: McGraw Hill.

Bobrow, E. E. and Shafer, D. W. (1987) *Pioneering New Products, A Market Survival Guide*. Homewood: Dow Jones-Irwin.

Boer, G. and Ettlie, J. (1999) 'Target costing can boost your bottom line', *Strategic Finance*, vol. 81, no. 1, pp. 49.

Booz, Allen and Hamilton Consultants (1982) *New Products Best Practices: Today and Tomorrow*. NY: Booz, Allen and Hamilton Inc.

Bougen, P. D. (1994) 'Joking apart: the serious side to the accounting stereotype'. *Accounting Organisations and Society*, vol. 15, no. 3, pp. 319-335.

Bowen, H. K., Clarke, K. B., Holloway, C. A. and Wheelwright, S. C. (1994) *The perpetual enterprise machine: seven keys to corporate renewal through successful product and process development*. NY: Oxford University Press.

Bowen, Alex and Ricketts, Martin, eds. (1992) *Stimulating innovation in industry: the challenge for the United Kingdom*, Michigan: Kogan Page

Braverman, H. (1974) *Labor and monopoly capital: The Degradation of Work in the Twentieth Century*. NY: Monthly Review Press.

Breznitz, D. (2007) *Innovation and the State: Political choice and strategies for growth in Israel, Taiwan and Ireland*, New Haven: Yale University Press

Bright, J., Davies, R. E., Downes, C. A. and Sweeting, R. C. (1992) 'The deployment of costing techniques and practices: A UK study', *Management Accounting*, vol. 3, no. 3, pp.201-212.

Bromwich, M. (1990) 'The case for strategic management accounting: The role of accounting information for strategy in competitive markets', *Accounting, Organisations and Society*, vol. 15, pp. 27-46.

Brown, S.L. and Eisenhardt, K.M. (1995) 'Product development: past research, present findings, and future directions', *Academy of Management Review*, vol. 20, no. 2, pp. 343-378.

- Brownell, P. (1995) *Research Methods in Management Accounting*. Melbourne: Coopers and Lybrand and AAANZ.
- Bruns, W. J., and McKinnon, S. (1993) 'Information & Managers: A Field Study'. *Journal of Management Accounting Research*, Fall, Vol. 5.
- Bryman, A. (1989) *Research Methods and Organisation Studies*. London: Routledge.
- Bryman, A. (2004) *Social Research Methods*, 2nd edn, Oxford: Oxford University Press.
- Buchanan, D., Boddy, D. and McCalman, J. (1988) 'Getting in, getting on, getting out, and getting back', in A. Bryman (ed), *Doing Research in Organisations*, London: Routledge, pp. 53-67.
- Burchell, S., Clubb, C., and Hopwood, A.G. (1985) Accounting in its social context: towards a history of value added in the United Kingdom. *Accounting, Organisations and Society*, vol. 10, no. 4, pp. 381-413.
- Burns, J. and Baldvinsdottir, G. (2005) 'An institutional perspective of accountants' new roles – the interplay of contradictions and praxis', *European Accounting Review*, vol. 14, no. 4, pp. 725-757.
- Burns, J. and Vaivio, J. (2001) 'Management accounting change', *Management Accounting Review*, vol. 12, no. 4, pp. 389-402.
- Burns, J., Ezzamel, M. and Scapens, R. (1999) 'Management accounting change in the UK', *Management Accounting: Magazine for Chartered Management Accountants*, vol. 77, no. 3, pp. 28.
- Burns, J. and Scapens, R. (2000) 'Role rehearsal', *Management Accounting: Magazine for Chartered Management Accountants*, vol. 78, no. 5, pp. 18.
- Burns, J. and Scapens, R. (2000) 'Conceptualising management accounting change: an institutional framework', *Management Accounting Research*, vol. 11, no. 1, pp. 3-25.
- Burns, J. and Yazdifar, H. (2001) 'Tricks or treats?', *Financial Management*, March, pp. 33-35.
- Burrell, G. and Morgan, G. (1979) *Sociological Paradigms and Organisational Analysis*, Aldershot, Hants: Ashgate.
- Büyüközkan, G.G. and Feyzioglu, O. (2004) 'A fuzzy-logic-based decision-making approach for new product development', *International Journal of Production Economics*, vol. 90, no. 1, pp. 27-45.
- Byrne, S. and Pierce, B. (2007) 'Towards a more comprehensive understanding of the roles of management accountants', *European Accounting Review*, vol. 16, no. 3, pp. 469-498.

- Caglio, A. (2003) 'Enterprise resource planning systems and accountants: towards hybridization?', *European Accounting Review*, vol. 12, no. 1, pp. 123-153
- Capon, N. and Glazer, R. (1987) 'Marketing and technology: A strategic coalignment', *Journal of Marketing*, vol. 51, no. 3, p. 1.
- Carr, C. and Tomkins, C. (1996) 'Strategic investment decisions: the importance of SCM. A comparative analysis of 51 case studies in U.K., U.S. and German companies', *Management Accounting Research*, vol. 7, no. 2, pp. 199-217.
- Chenhall, R. (2003) 'Management control systems design within its organisational context: findings from contingency-based research and directions for the future', *Accounting, Organisations and Society*, vol. 28, no. 2-3, pp. 127-168.
- Chenhall, R. H. and Langfield-Smith, K. (2007) 'Multiple perspectives of performance measures' *European Management Journal*, vol. 25, no. 4, pp. 266-282.
- Chenhall, R. H. and Morris, D. (1986) 'The Impact of Structure, Environment and Interdependence on the Perceived Usefulness of Management Accounting Systems'. *The Accounting Review*, vol. LXI, no. 1., pp. 16-35.
- Chua, W.F. (1986) 'Radical developments in accounting thought', *Accounting Review*, vol. 61, no. 4, pp. 601.
- Clarke, P. J. (1992) 'Management accounting practices in Irish manufacturing businesses: A pilot study'. *The Irish Accounting Review*, Spring, pp. 199-216.
- Clarke, K. B. and Fujimoto, T. (1991) *Product Development Performance*. Boston, MA: Harvard Business School Press.
- Coad, A.F. and Herbert, I.P. (2009) 'Back to the future: New potential for structuration theory in management accounting research?', *Management Accounting Research*, vol. 20, no. 3, pp. 177-192.
- Coffey, A. and Atkinson, P. (1996) *Making Sense of Qualitative Data*, Thousand Oaks, CA: Sage.
- Cohen, I. J. (1989) *Structuration theory: Anthony Giddens and the Constitution of Social Life*, Macmillan, Basingstoke.
- Conrad, L. (2005) 'A structuration analysis of accounting systems and systems of accountability in the privatised gas industry', *Critical Perspectives on Accounting*, vol. 16, no. 1, pp. 1-26.
- Cooper, R.G. (1988) 'Predevelopment activities determine new product success', *Industrial Marketing Management*, vol. 17, no. 3, pp. 237-247.
- Cooper, R. (1990) 'Stage-gate systems: A new tool for managing new products', *Business Horizons*, vol. 33, no. 3, pp. 44-54.

Cooper, R. (1996) 'Overhauling the new product process', *Industrial Marketing Management*, vol. 25, no. 6, pp. 465-482.

Cooper, R. (1998) 'Benchmarking new product performance: Results of the best practices study', *European Management Journal*, vol. 16, no. 1, pp. 1-17.

Cooper, R.G. (1999) 'From experience: the invisible success factors in product innovation', *Journal of Product Innovation Management*, vol. 16, no. 2, pp. 115-133.

Cooper, R. and Chew, W.B. (1996) 'Control tomorrow's costs through today's designs', *Harvard Business Review*, vol. 74, no. 1, pp. 88-97.

Cooper, R.G. and Edgett, S.J. (2003) 'Overcoming the Crunch in Resources for New Product Development', *Research Technology Management*, vol. 46, no. 3, pp. 48.

Cooper, R. and Kaplan, R. S. (1987) 'How cost accounting systematically distorts product costs' In Bruns, W. and Kaplan, R. S., (eds) *Accounting and Management: Field Study Perspectives*, Boston: Harvard Business School Press.

Cooper, R. and Kaplan, R. S. (1988) 'Measure costs right: make the right decision'. *Harvard Business Review*, vol. 88, no. 5, pp. 96-103.

Cooper, R. and Kaplan, R. S. (1991) *The Design of Cost Management Systems*, New Jersey: Prentice Hall International.

Cooper, R.G. and Kleinschmidt, E.J. (1986) 'An investigation into the new product process: steps, deficiencies, and impact', *Journal of Product Innovation Management*, vol. 3, no. 2, pp. 71-85.

Cooper, R.G. and Kleinschmidt, E.J. (1987) 'New products: What separates winners from losers?', *Journal of Product Innovation Management*, vol. 4, no. 3, pp. 169-184.

Cooper, R.G. and Kleinschmidt, E.J. (1995) 'Benchmarking the firm's critical success factors in new product development', *Journal of Product Innovation Management*, vol. 12, no. 5, pp. 374-391.

Cooper, R. and Slagmulder, R. (1999) 'Develop Profitable New Products with Target Costing' *Sloan Management Review*, vol. 40, no. 4, pp. 23-33.

Daft, R.L. and MacIntosh, N.B. (1978) 'A New Approach to Design and Use of Management Information', *California Management Review*, vol. 21, no. 1, pp. 82-92.

Damanpour, F. (1991) 'Organisational Innovation: a Meta-Analysis of Effects of Determinants and Moderators', *Academy of Management Journal*, vol. 34, no. 3, pp. 555-590.

Darke, P., Shanks, G. and Broadbent, M. (1998) 'Successfully completing case study research: combining rigour, relevance and pragmatism', *Information Systems Journal*, vol. 8, no. 4, pp. 273-289.

- Davila, T. (2000) 'An empirical study on the drivers of management control systems' design in new product development', *Accounting, Organisations and Society*, vol. 25, no. 4-5, pp. 383-409.
- Davila, A. and Wouters, M. (2004) 'Designing cost-competitive technology products through cost management', *Accounting Horizons*, vol. 18, no. 1, pp. 13-26.
- Davis, R.E. (1993) 'From experience: The role of market research in the development of new consumer products', *Journal of Product Innovation Management*, vol. 10, no. 4, pp. 309-317.
- De Loo, I., Verstegen, B. and Swagerman, D. (2011) 'Understanding the roles of management accountants', *European Business Review*, Vol. 23, No. 3, pp.287-313.
- Demirbas, A. (2008) *Biodiesel: A Realistic Fuel Alternative*, London: Springer, Verlag.
- Dean Jr., J.W. and Susman, G.I. (1989) 'Organising for manufacturable design', *Harvard Business Review*, vol. 67, no. 1, pp. 28-36.
- Deetz, S. (1996) 'Describing differences in approaches to organisation science: rethinking Burrell and Morgan and their legacy', *Organisation Science*, vol. 7, no. 2, pp. pp. 191-207.
- Dent, J.F. (1991) 'Accounting and organisational cultures: A field study of the emergence of a new organisational reality', *Accounting, Organisations and Society*, vol. 16, no. 8, pp. 705-732.
- Dermer, J. (1990) 'The strategic agenda: accounting for issues and support', *Accounting, Organisations and Society*, vol. 15, no. 1-2, pp.67-76.
- Dermer, J. (1977) *Management Planning & Control Systems*. Illinois: Irwin.
- Deschamps, J. and Nayak, P. R. (1995) *Product Juggernauts: How Companies Mobilise to Generate a Stream of Market Winners*, Boston: Harvard Business School Press
- Di Benedetto, C. A. (1999) 'Identifying the key success factors in new product launch', *Journal of Product Innovation Management*, volume 16, issue 6, pages 530-544,
- Dolan, R. J. (1992) *Managing the New Product Development Process*, Reading, M.A: Addison-Wesley Publishing Company.
- Dougherty, D. (1990) 'Understanding new markets for new products', *Strategic Management Journal*, Vol. 11, pp. 59-78.
- Dougherty, D. and Hardy, C. (1996) 'Sustained product innovation in large, mature organisations', *Academy of Management Journal*, vol. 39, no. 5, pp. 1120-1130.

Drury, C., Braund, S., Alphaorne, P. and Tayles, M. (1993) 'A survey of management accounting practices in UK manufacturing companies'. *Research commissioned by the Chartered Association of Certified Accountants*.

Dunk, A. (2004) 'Product life cycle cost analysis: the impact of customer profiling, competitive advantage, and quality of IS information', *Management Accounting Research*, vol. 15, no. 4, pp. 401-414.

Dwyer, L. and Mellor, R. (1991) 'Organisational environment, new product process activities, and project outcomes', *Journal of Product Innovation Management*, vol. 8, no. 1, pp. 39-48.

Easterby-Smith, M., Thorpe, R. and Lowe, A. (1991) *Management Research: an Introduction*, London: Sage.

Edgett, S. (1994) 'The traits of successful new service development', *Journal of Services Marketing*, vol. 8, no. 3, pp. 40.

Ellis, P.D. (1997) *Evaluation of R&D processes: Effectiveness through measurements*, Boston, Mass: Artech House.

Emirbayer, M. and Mische, A. (1998) 'What is agency?', *American Journal of Sociology*, vol. 103, no. 4, pp. 962-1023.

Englund, H. and Gerdin, J. (2008) 'Structuration theory and mediating concepts: Pitfalls and implications for management accounting research' *Critical Perspectives on Accounting*, vol. 19, no. 8, pp. 1122-1134.

Englund, H., Gerdin, J. and Burns, J (2011) '25 Years of Giddens in accounting research: Achievements, limitations and the future' *Accounting, Organisations and Society*, vol. 36, no. 8, pp. 494-513.

'Entrepreneurship in Ireland' (2010) Global Entrepreneurship Monitor Report, *Enterprise Ireland Publication*
<http://www.enterprise-ireland.com/en/Publications/Reports-Published/Strategies/2010-Global-Entrepreneurship-Monitor-Report.pdf>

Ezzamel, M., Lilley, S. and Willmott, H. (1994) 'A survey of management accounting practices', *Management Accounting*, Jul/Aug, pp.10-12.

Faust, W. (1993) 'Cross-functional teams in design: a case study of the thermos thermal electric grill', *Design Management Journal*, vol. 4, no. 4, Fall, pp. 29-33.

Feeney, O. (2006) *Management Perspectives on the Role of the Management Accountant as an Information provider*, Unpublished Dissertation, Dublin City University Business School.

Feeney, O. and Pierce, B. (2007) 'Today's management accountant: honest bean counter and savvy business advisor?', *Accountancy Ireland*, vol. 39, no. 5, pp. 16-21.

Feldman, L.P. and Page, A.L. (1984) 'Principles vs. practice in new product planning', *Journal of Product Innovation Management*, vol. 1, no. 1, pp. 43-55.

Fielding, N. G. (2002) 'Automating the ineffable: qualitative software and the meaning of qualitative research', in T. May (ed), *Qualitative Research in Action*, London: Sage, pp. 161-178.

Finiw, M. (1992) *Design Management Institute (DMI) Special Report, Best Practices: Analytical Framework for Design Management and Comparative Analysis of Design Management Institute Case Studies* Boston, MA, Design Management Institute Press.

Forster, N. (1994) 'The Analysis of company documentation' in C. Cassell and G. Symon (eds), *Qualitative Methods in Organisational Research*, London: Sage, pp. 147-166.

'Forfas Annual Report' (2004) *Forfas Publication*
http://www.forfas.ie/media/forfas050601_annual_report_2004_english.pdf

'Forfas Research and Development Statistics in Ireland' (2009) *Forfas Publication*
http://www.forfas.ie/media/forfas090908_research_development_statistics.pdf

Foster, G. and Gupta, M. (1994) 'Marketing, cost management and management accounting', *Journal of Management Accounting Research*, vol. 6, pp. 43-77.

Gerdin, J. and Greve, J. (2004) 'Forms of contingency fit in management accounting research- a critical review', *Accounting, Organisations and Society*, vol. 29, no. 3/4, pp. 303-326.

Giddens, A. (1976) *New Rules of Sociological Method: A Positive Critique of Interpretative Sociologies*, Hutchinson, London.

Giddens, C.J. (1979) *Central Problems in Social Theory: Action, Structure, and Contradiction in Social Analysis*, University of California Press, Berkeley.

Giddens, A. (1984) *The Constitution of Society: Introduction of the Theory of Structuration*, University of California Press, Berkeley.

Giddens, A. (1987) *Social theory and modern sociology*, Stanford University Press, Stanford, CA.

Giddens, A. (1990) 'Structuration theory and sociological analysis', in J. Clark, C. Modgil and S. Modgil (Eds.) *Anthony Giddens: Concensus and Controversy*. London: Falmer Press.

Giddens, A. and Piercon, C. (1998) *Conversations with Anthony Giddens: Making Sense of Modernity*, Cambridge: Polity Press.

Gill, J. and Johnson, P. (1997) *Research Methods for Managers*, 2nd Edn., London: Paul Chapman Publishing.

Gleadle, P. (1999) 'The interface between finance and new product development', *Management Accounting: Magazine for Chartered Management Accountants*, vol. 77, no. 7, pp. 24.

Govindarajan, V. and Gupta, A.K. (1985) 'Linking control systems to business unit strategy: impact on performance', *Accounting, Organisations and Society*, vol. 10, no. 1, pp. 51-66.

Granlund, M. and Lukka, K. (1998) 'Towards increasing business orientation: Finnish management accountants in a changing cultural context', *Management Accounting Research*, vol. 9, no. 2, pp. 185-211.

Greenhalgh, T. and Stones, R. (2010) 'Theorising big IT programmes in healthcare: Strong structuration theory meets actor-network theory', *Social Science and Medicine*, vol. 70, no. 9, pp. 1285-1294

Gregson, N. (1989) 'On the (ir)levance of structuration theory to empirical research', in D. Held and J.B. Thompson, (Eds.), *Social Theory of Modern Societies: Anthony Giddens and his Critics*. Cambridge: Cambridge University Press.

Grossman, G. and Helpman, E. (2001) 'Intergenerational redistribution with short lived governments', *The Economic Journal*, volume 108, issue 450, pages 1299–1329

Griffin, A. and Page, A.L. (1993) 'An interim report on measuring product development success and failure', *Journal of Product Innovation Management*, vol. 10, no. 4, pp. 291-308.

Gummesson, E. (2000) *Qualitative Methods in Management Research*, Thousand Oaks, CA: Sage

Guiding, C. (1999) 'Competitor focused accounting: an exploratory note', *Accounting, Organisations and Society*, vol. 24, pp. 583-595.

Guiding, C., Cravens, K. and Tayles, M. (2000) 'An international comparison of strategic management accounting practices', *Management Accounting Research*, vol. 11, no. 1, pp. 113-135.

Habermas, J. (1987) *The Theory of Communicative Action: Reason and the Rationalisation of Society*, Boston MA: Beacon Press.

Hakim, C. (2000) *Work-lifestyle choices in the 21st century: preference theory*, Oxford University Press, Oxford; New York.

Halberstam, D. (1987) *The Reckoning*, Bloomsbury, London.

Hansen, R. W. (1997) 'Reducing delivery times in engineer-to-order firms by using the concepts of concurrent engineering'. *Proceedings of the Fourth International Conference on Concurrent Enterprise*, University of Nottingham, October, pp. 495-508.

- Haque, B., Pawar, K. and Barson, R. (2000) 'Analysing organisational issues in concurrent new product development', *International Journal of Production Economics*, vol. 67, no. 2, pp. 169-182.
- Hayes, R.H. and Abernathy, W.J. (1980) 'Managing our way to economic decline', *Harvard Business Review*, vol. 58, no. 4, pp. 67-77.
- Herstatt, C., Stockstrom, C., Tschirku, H and Nagahira, A. (2006) *Management of Technology and Innovation in Japan*, Berlin: Springer-Verlag.
- Hertenstein, J.H. and Platt, M.B. (1997.) 'Developing a strategic design culture', *Design Management Journal*, Vol. 2 (2): 10– 19.
- Hertenstein, J.H. and Platt, M.B. (1998) 'Why product development teams need management accountants', *Management Accounting (N.Y.)*, vol. 79, no. 10, pp. 50-55.
- Hertenstein, J.H. and Platt, M.B. (2000) 'Performance measures and management control in new product development', *Accounting Horizons*, vol. 14, no. 3, pp. 303-323.
- Hertenstein, J.H., Platt, M.B. and Veryzer, R.W. (2005) 'The impact of industrial design effectiveness on corporate financial performance', *Journal of Product Innovation Management*, vol. 22, no. 1, pp. 3-21.
- Hillson, D. (2002) 'Extending the risk process to manage opportunities', *International Journal of Project Management*, vol. 20, no. 3, pp. 235-240.
- Hiromoto, T. (1988) 'Another hidden edge- Japanese management accounting', *Harvard Business Review*, vol. 66, no. 4, pp. 22-26.
- Hise, R.T., O'Neal, L., McNeal, J.U. and Parasuraman, A. (1989) 'The effect of product design activities on commercial success levels of new industrial products', *Journal of Product Innovation Management*, vol. 6, no. 1, pp. 43-50.
- Hopwood, A.G. (1972) 'An Empirical Study of the Role of Accounting Data in Performance Evaluation', *Journal of Accounting Research*, vol. 10, no. 3, pp. 156-182.
- Horngren, C. T. (1972) *Cost Accounting: A Managerial Emphasis*, 3rd edition, Englewood Cliffs, N.J.: Prentice-Hall.
- Hopper, T. and Armstrong, P. (1991) 'Cost accounting, controlling labour and the rise of conglomerates', *Accounting, Organisations and Society*, vol. 16, no. 5–6, pp. 405-438.
- Hopper, T. and Powell, A. (1985) 'Making sense of research into the organisational and social aspects of management accounting: a review of its underlying assumptions', *Journal of Management Studies*, vol. 22, no. 5, pp. 429-465.

- Hopwood, A.G. (1987) 'The archeology of accounting systems', *Accounting, Organisations and Society*, vol. 12, no. 3, pp. 207-234.
- Hopwood, A. G. (1989) 'Organisational contingencies and accounting configurations'. In B. Friedman and L Ostman (eds), *Accounting Development- some perspectives: a book in honour of Sven-Erik Johansson* (pp.23-44). Stockholm: Economic Research Institute
- Huang, X., Soutar, G.N. and Brown, A. (2004) 'Measuring new product success: an empirical investigation of Australian SMEs', *Industrial Marketing Management*, vol. 33, no. 2, pp. 117-123.
- Hughes, P. and Pierce, B. (2006) 'The accountant's contribution to new product development'. *The Irish Accounting Review*, Vol. 13, No. 1, pp. 47-68.
- Humphrey, C. and Scapens, R. W. (1996) 'Methodological themes: Theories and case studies of organisational accounting practices: limitation or liberation?', *Accounting, Auditing and Accountability*, vol. 9 , no. 4, pp.86 – 106.
- Humphrey, C. and Lee, B. (2004) 'The real life guide to accounting research: a strategy for inclusion', *Qualitative Research in Accounting and Management*, vol. 1, no.1, pp.66 – 84.
- Hultink, E.J. and Robben, H.S.J. (1995) 'Measuring new product success: The difference that time perspective makes', *Journal of Product Innovation Management*, vol. 12, no. 5, pp. 392-405.
- Innes, J. and Mitchell, F. (1995) 'A survey of activity-based costing in the U.K.'s largest companies', *Management Accounting Research*, vol. 6, no. 2, pp. 137-153.
- Innes, J., Mitchell, F. and Sinclair, D. (2000) 'Activity-based costing in the U.K.'s largest companies: a comparison of 1994 and 1999 survey results', *Management Accounting Research*, vol. 11, no. 3, pp. 349-362.
- 'Innovation in Ireland' (2008) *Department of Enterprise Trade and Employment Publication*
<http://www.djei.ie/publications/science/innovationpolicystatement.pdf>
- Jack, L. (2004) *The Persistence of Post War Accounting Practices in UK Agriculture*, Unpublished thesis, University of Essex, Colchester.
- Jack, L. (2005) 'Stocks of knowledge, simplification and unintended consequences: the persistence of post-war accounting practices in UK agriculture', *Management Accounting Research*, vol. 16, no. 1, pp. 59-79.
- Jack, L and Kholeif,A. (2007) 'Introducing strong structuration theory for informing qualitative case studies in organisation, management and accounting research', *Qualitative Research in Organisations and Management: An International Journal*, vol. 2, no. 3, pp.208-225.

- Jack, L. and Kholeif, A. (2008) 'Enterprise resource planning and a contest to limit the role of management accountants: A strong structuration perspective', *Accounting Forum*, vol. 32, no. 1, pp. 30-45.
- Jaedicke, R.K. and Robichek, A.A. (1964) 'Cost-volume-profit analysis under conditions of uncertainty', *Accounting Review*, vol. 39, no. 4, pp. 917.
- Järvenpää, M. (2007) 'Making business partners: A case study on how management accounting culture was changed', *European Accounting Review*, vol. 16, no. 1, pp. 99-142
- Johnson, D. (2001) 'What is innovation and entrepreneurship? Lessons for larger organisations'. *Industrial and Commercial Training*, Vol. 33 Iss: 4, pp.135 - 140
- Johnson, H. T. and Kaplan, R. S. (1987) *Relevance Lost: the Rise and Fall of Management Accounting*, Boston: Harvard Business School Press.
- Jonsson, S. and Gronlund, A. (1988) 'Life with a subcontractor: new technology and management accounting'. *Accounting Organisation and Society*, vol. 13, no. 15, pp. 512-532.
- Jones, M., (1999) 'Structuration theory' in W. Curry, R. Galliers and B. Galliers, (eds), *Rethinking Management Information Systems*, Oxford: Oxford University Press
- Kahn, K. (1996) 'Interdepartmental integration: A definition with implications for product development performance', *Journal of Product Innovation Management*, vol. 13, no. 2, pp. 137-151.
- Järvenpää, M. (2007) 'Making business partners: a case study on how management accounting culture was changed', *European Accounting Review*, Vol. 16, No. 1, pp. 99-142.
- Jones, M.R. and Karsten, H. (2008) 'Giddens's structuration theory and information systems research', *MIS Quarterly*, vol. 32, no. 1, pp. 127-157.
- Kakkuri-Knuuttila, M., Lukka, K. and Kuorikoski, J. (2008) 'Straddling between paradigms: A naturalistic philosophical case study on interpretive research in management accounting', *Accounting, Organisations and Society*, vol. 33, no. 2-3, pp. 267-291.
- Kaplan, R.S. and Norton, D.P. (1992) 'The Balanced Scorecard--Measures That Drive Performance', *Harvard business review*, vol. 70, no. 1, pp. 71-79.
- Kaplan, R.S. and Norton, D.P. (1996) 'Using the Balanced Scorecard as a Strategic Management System', *Harvard Business Review*, vol. 74, no. 1, pp. 75-85.
- Kaplan, R.S. and Norton, D.P. (1993) 'Putting the Balanced Scorecard to Work', *Harvard Business Review*, vol. 71, no. 5, pp. 134-147.

Kaplan, R. S., Shank, J., Horngren, C., Boer, G., Ferrara, W. and Robinson, M. (1992) 'Contribution margin analysis: no longer relevant/strategic cost management: the new cost paradigm' *Journal of Management Accounting Research*, vol. 2. Pp. 1-32.

Katzenbach, J. R and Smith, D. K. (1993) *The Wisdom of Teams: Creating the High Performance Organisation*, Boston MA: Harvard Business School Press.

Khandwalla, P.N. (1972) 'The Effect of Different Types of Competition on the Use of Management Controls', *Journal of Accounting Research*, vol. 10, no. 2, pp. 275-285.

Kholeif, A. (2005) *Enterprise Resource Planning Implementation and Management Accounting Change in a Transitional Country: an Interpretive Case Study from Egypt*, Unpublished Thesis, University of Essex, Colchester.

Khurana, A. and Rosenthal, S.R. (1997) 'Integrating the fuzzy front end of new product development', *Sloan Management Review*, vol. 38, no. 2, pp. 103-120.

Kilfoyle, E. and Richardson, A.J. (2011) 'Agency and structure in budgeting: Thesis, antithesis and synthesis', *Critical Perspectives on Accounting*, vol. 22, no. 2, pp. 183-199.

King, N. (1994) 'The qualitative research interview', in C. Cassell and G. Symon (eds), *Qualitative Methods in Organisational Research*, London: Sage, pp. 14-36.

Kuczmarski, T. (1996), 'What is innovation? The art of welcoming risk', *Journal of Consumer Marketing*, vol. 13, no. 5, pp. 7 - 11

Kvale, S. (1983) 'The qualitative research interview: a phenomenological and hermeneutical mode of understanding', *Journal of Phenomenological Psychology*, Vol. 14, No. 2, pp. 171-196.

Langerak, F., Hultink, E.J. and Robben, H.S.J. (2004) 'The impact of market orientation, product advantage, and launch proficiency on new product performance and organisational performance', *Journal of Product Innovation Management*, vol. 21, no. 2, pp. 79-94.

Langfield-Smith, K. (2008) 'Strategic management accounting: How far have we come in 25 years', *Accounting, Organisations and Society*, vol. 21, no. 2, pp. 204-228.

Langfield-Smith, K. (1997) 'Management control systems and strategy: A critical review', *Accounting, Organisations and Society*, vol. 22, no. 2, pp. 207-232.

Lansiti, M. (1995) 'Shooting the rapids: Managing product development in turbulent environments', *California management review*, vol. 38, no. 1, pp. 37.

Laughlin, R. (1995) 'Methodological themes- empirical research in accounting: Alternative approaches and a case for 'middle-range' thinking'. *Accounting, Auditing and Accountability Journal*, Vol. 8, No. 1, pp.63-87.

- Lorsch, J.W. and Lawrence, P.R. (1967) *Organisation and Environment*, Boston MA: Harvard University press
- Latour, B. (2005) *Reassembling the Social: An Introduction to Actor-Network-Theory*, USA: Oxford University Press, USA.
- Lee, W. L. (1999) *Using Qualitative Methods in Organisational Research*, Thousand Oaks, CA: Sage.
- Lee, M.W., Yun, M.H. and Han, S.H. (2001) 'High Touch – an innovative scheme for new product development: case studies 1994–1998', *International Journal of Industrial Ergonomics*, vol. 27, no. 4, pp. 271-283.
- Lincoln, Y. S. and Guba, E. G. (1985) *Naturalistic Inquiry*, Beverly Hills, CA: Sage.
- Lipovetsky, S., Tishler, A., Dvir, D. and Shenhar, A. (1997) 'The relative importance of project success dimensions', *R&D Management*, vol. 27, pp. 97–106.
- Lodh, S.C. and Gaffikin, M.J.R. (2003) 'Implementation of an integrated accounting and cost management system using the SAP system: a field study', *European Accounting Review*, vol. 12, no. 1, pp. 85-121.
- Loft, A. (1986) 'Towards a critical understanding of accounting: The case of cost accounting in the U.K., 1914–1925', *Accounting, Organisations and Society*, vol. 11, no. 2, pp. 137-169.
- Lord, B. (1996) 'Strategic management accounting: the emporor's new clothes?' *Management Accounting Research*, vol. 7, no. 3, pp. 347-366.
- Lukka, K. (2007) 'Management accounting change and stability: Loosely coupled rules and routines in action', *Management Accounting Research*, vol. 18, no. 1, pp. 76-101.
- Lukka, K. and Kasanen, E. (1995) 'The problem of generalisability: anecdotes and evidence in accounting research', *Accounting, Auditing & Accountability*, vol. 8, no. 5, pp.71 – 90.
- Macintosh, N. and Hopper, T. (1991) 'Management accounting as a disciplinary practice: theory, case analysis and implications', Third Interdisciplinary Perspectives on Accounting Conference, Manchester.
- Macintosh, N. and Scapens, R.(1990) 'Structuration theory in management accounting', *Accounting, Organisations and Society*, vol. 15, no. 5, pp. 455-477.
- Macintosh, N.B. and Scapens, R.W. (1991) 'Management accounting and control systems: A structuration theory analysis', *Journal of Management Accounting Research*, vol. 3, pp. 131-158.

- Mahajan, V. and Wind, J. (1992) 'New product models: Practice, shortcomings and desired improvements', *Journal of Product Innovation Management*, vol. 9, no. 2, pp. 128-139.
- March, A. (1991) 'Some teams work better than others', *Design Management Journal*, Spring, pp. 49-53.
- McDermott, C. and Handfield, R. (2000) 'Concurrent development and strategic outsourcing: Do the rules change in breakthrough innovation?', *The Journal of High Technology Management Research*, vol. 11, no. 1, pp. 35-57.
- McGuinness, N. W. and Conway, A. H. (1989) 'Managing the search for new product concepts, a strategic approach'. *R&D Management*, vol. 19, no. 4, pp.207-308.
- Merchant, K.A. (1985) 'Budgeting and the propensity to create budgetary slack', *Accounting Organisations and Society*, vol. 10, no. 2, pp. 201-210.
- Mendoza, C. and Bescos, P. L. (2001) 'An explanatory model of managers' information needs: implications for management accounting'. *The European Accounting Review*, vol. 10, no. 2, pp. 257-289.
- Miller, P. and O'Leary, T. (1987) 'Accounting and the construction of the governable person', *Accounting, Organisations and Society*, vol. 12, no. 3, pp. 235-265.
- Mia, L. and Chenhall, R. H. (1994) 'The Usefulness of Management Accounting Systems, Functional Differentiation and Managerial Effectiveness'. *Accounting, Organisation and Society*, vol. 19, no. 1, pp.1-13.
- Moenaert, R.K. and Souder, W.E. (1990) 'An Analysis of the Use of Extrafunctional Information by R&D and Marketing Personnel: Review and Model', *Journal of Product Innovation Management*, vol. 7, no. 3, pp. 213-229.
- Montoya-Weiss, M.M. and Calantone, R. (1994) 'Determinants of new product performance: A review and meta-analysis', *Journal of Product Innovation Management*, vol. 11, no. 5, pp. 397-417.
- Morowska, E. (1996) *Insecure Prosperity: Small-Town Jews in Industrial America 1890-1940*, Princeton: Princeton University Press.
- Mouzelis, N. (1991) *Back to Sociological Theory: The Construction of Social Orders*, London: Macmillan.
- Myers, S. and Marquis, D. G. (1969) *Successful industrial innovation: a study of factors underlying innovation in selected firms*, Washington DC: National Science Foundation
- Nadler, G. (1991) 'Design teams: breakthroughs for effectiveness', *Design Management Journal*, Spring, pp. 10-19.

Nanni, A., Dixon, J. R and Vollmann, T. E. (1992) 'Integrated performance measurement: Management accounting to support the new manufacturing realities', *Journal of Management Accounting Research*, vol. 4, pp. 1-19.

Nijkamp, P. H., van Delft, H and van Veen Groot, D (2005), *Sustainable mobility and globalisation: New challenges for policy research*, in Gangopadhyay, P., and M. Chatterji (eds), *Economics of Globalisation*, Aldershot: Ashgate Publishing Limited, pp. 67-76.

Nixon, B. (1998) 'Research and development performance measurement: a case study', *Management Accounting Research*, vol. 9, no. 3, pp. 329-355.

Nixon, B. (1997) 'Performance measurements for R&D', *R&D Management*, vol. 27, no. 1, pp. 87.

Nixon, B. (1995) 'Technology investment and management accounting practice', *British Journal of Management*, vol. 6, no. 4, pp. 271.

Nixon, B. and Burns, J. (2012) 'The paradox of strategic management accounting', *Management Accounting Research*, vol. 23, pp. 229-244.

Nixon, B. and Innes, J. (1998) 'Management accountants and design', *Management Accounting: Magazine for Chartered Management Accountants*, vol. 76, no. 6, p. 36.

Nixon, B. and Innes, J. (1997) 'Management accounting for design', *Management Accounting: Magazine for Chartered Management Accountants*, vol. 75, no. 8, p. 40.

O'Connor, P. (1994) 'Implementing a stage-gate process: A Multi-Company Perspective', *Journal of Product Innovation Management*, vol. 11, no. 3, pp. 183-200.

Olson, E.M., Walker, J. and Ruekert, R.W. (1995) 'Organising for effective new product development: The moderating role of product innovativeness', *Journal of Marketing*, vol. 59, no. 1, pp. 48.

Otley, D. (1994) 'Management control in contemporary organisations: towards a wider framework', *Management Accounting Research*, vol. 5, no. 3-4, pp. 289-299.

Otley, D. (1980) 'The contingency theory of management accounting: Achievement and prognosis', *Accounting, Organisations and Society*, vol. 5, no. 4, pp. 413-428.

Otley, D.T. (1978) 'Budget Use and Managerial Performance', *Journal of Accounting Research*, vol. 16, no. 1, pp. 122-149.

Otley, D.T., Merchant, K.A. and Emmanuel, C.R. (1991), *Accounting for Management Control*, 2nd edn, Chapman & Hall.

Paddison, C. S. and Merchant, K. A. (1987) *Alcon Laboratories, I, Harvard Business School Case Study 9-187-197*. Boston, MA, Publishing Division, Harvard Business School.

Palmer, R. J. (1992) 'Strategic goals and the design of strategic management accounting systems', *Advances in Management Accounting*, vol. 1, pp. 179-204.

Parker, J. (2000) *Structuration*. Buckingham: Open University Press

Parker, J. (2006) 'Structuration's future? From 'all and everywhere' to 'who did what, where, when, how and why?' *Journal of Critical Realism*, vol. 5, no. 1, pp.122-138.

Page, A.L. (1993) 'Assessing new product development practices and performance: establishing crucial norms', *Journal of Product Innovation Management*, vol. 10, no. 4, pp. 273-290.

Patton, M.Q. (2002) *Qualitative Research and Evaluation Methods*, 3rd edn, Thousand Oaks, Calif: Sage Publications,

Philips, G. and Heskett, J. (1989) *A Study of the Management of Corporate Design*, London: Trefoil.

Pierce, B. (2001) 'Management accounting without accountants?', *Accountancy Ireland*, vol. 33, no. 3, pp. 10.

Pierce, B. and O'Dea, T. (2003) 'Management accounting information and the needs of managers: Perceptions of managers and accountants compared'. *British Accounting Review*, vol. 35, no. 3, pp. 257-290.

Pierce, B. and O'Dea, T. (1998) 'An empirical study of management accounting practices in Ireland'. *The Irish Accounting Review*, vol. 5, No. 2, pp.35-65.

Piper, J. (1978) 'Determinants of Financial Control Systems for Multiple Retailers-Some Case Study Evidence'. Unpublished paper, University of Loughborough.

Poolton, J. and Barclay, I. (1998) 'New product development: From past research to future applications', *Industrial Marketing Management*, vol. 27, no. 3, pp. 197-212.

Porter, M. E. (1980) *Competitive Strategy: Techniques for Analysing Industries and Competitors*, New York: Free Press

Porter, M.E. (1998) *Competitive Advantage: Creating and Sustaining Superior Performance*, New York: Free Press.

Pozzebon, M. and Pinsonneault, A. (2005) 'Challenges in conducting empirical work using structuration theory: Learning from IT research', *Organisation Studies*, vol. 26, no. 9, pp. 1353-1376.

Preston, A.M., Cooper, D.J. and Coombs, R.W. (1992) 'Fabricating budgets: A study of the production of management budgeting in the national health service', *Accounting, Organisations and Society*, vol. 17, no. 6, pp. 561-593.

'Programme for Government' (2011) *Department of An Taoiseach Publication*
<http://www.gov.ie/wp-content/uploads/ProgrammeforGovernmentFinal.pdf>

'Programme for Government 2007 – 2012 Progress Report' (2008) *Department of An Taoiseach Publication*

http://www.taoiseach.gov.ie/attached_files/Pdf%20files/TaoiseachEnglish.pdf

Punch, K. (2005) *Introduction to Social Research: Quantitative and Qualitative Approaches*, 2nd edn, London: Sage

Quattrone, P. and Hopper, T. (2005) 'A 'time-space odyssey': management control systems in two multinational organisations', *Accounting, Organisations and Society*, vol. 30, no. 7-8, pp. 735-764.

Quinn, M. (2010) *Continuity and Change in Management Accounting- Evidence from the Corrugated Container Sector*, Unpublished thesis, University of Dundee.

Rabino, S. (2001) 'The accountant's contribution to product development teams - a case study', *Journal of Engineering and Technology Management*, vol. 18, no. 1, pp. 73-90.

Reidel, J. and Pawar, K. S. (1991) 'The strategic choice of simultaneous engineering for the introduction of new products'. *International Journal of Technology Management*, Special Issue on Manufacturing Strategy.

'Report of the Research Prioritisation Steering Group' (2011) *Forfas Publication*

http://www.forfas.ie/media/ffs20120301Research_Prioritisation_Exercise_Report.pdf

Richards, L. (2005) *Handling Qualitative Data*, London: Sage.

Roberts, J. (1990) 'Strategy and accounting in a U.K. conglomerate', *Accounting, Organisations and Society*, vol. 15, no. 1-2, pp. 107-126.

Roberts, J. and Scapens, R. (1985) 'Accounting systems and systems of accountability- understanding accounting practices in their organisational contexts', *Accounting, Organisations and Society*, vol. 10, no. 4, pp. 443-456.

Rochford, L. (1991) 'Generating and screening new product ideas'. In Hart, S. (eds.), *New Product Development*, London: Dryden Press, pp. 255-267.

Romer, P. (1990) 'Endogenous Technological Change', *Journal of Political Economy*, Vol. 98, no. 5, pp. 71-102.

Roslender, R. (1995) 'Accounting for strategic positioning: Responding to the crises in management accounting'. *British Journal of Management*, vol. 6, pp. 45-57.

Roslender, R. (2006) 'Critical theory', in Z. Hoque (ed.), *Methodological Issues in Accounting Research: Theories and Methods*, London: Spiramus, pp. 247-269.

Ruane, F. and Siedschlag, L. (2011) 'Boosting innovation and productivity in enterprises: what works?' *ESRI Renewal paper Series*

- Ryan, B., Theobald, M, and Scapens, R.W. (2002) *Research Method and Methodology in Finance and Accounting*, 2nd edn, London: Thomson Learning
- Saad, K.N. and Erickson, T.J. (1991) *Third generation R&D: Managing the Link to Corporate Strategy*, Harvard Business School Press, Boston, Mass.
- Sandström, J. and Toivanen, J. (2002) 'The problem of managing product development engineers: Can the balanced scorecard be an answer?', *International Journal of Production Economics*, vol. 78, no. 1, pp. 79-90.
- Sathe, V. (1982) *Controller Involvement in Management*, N.J. Englewood Cliffs: Prentice Hall Inc.
- Scapens, R. W. (2004) 'Doing case study research', in C. Humphrey and B. Lee (eds), *The Real Life Guide to Accounting Research: A Behind the Scenes View of Using Qualitative Research Methods*, London: Elsevier, pp. 257-280.
- Scapens, R.W. (2006) 'Understanding management accounting practices: A personal journey', *The British Accounting Review*, vol. 38, no. 1, pp. 1-30.
- Scapens, R.W., Ezzamel, M., Burns, J. and Baldvinsdottir, G. (2003). '*The Future Direction of UK Management Accounting Practice*', London: Elsevier CIMA publications.
- Scapens, R.W. and Jazayeri, M. (2003) 'ERP systems and management accounting change: opportunities or impacts? A research note', *European Accounting Review*, vol. 12, no. 1, pp. 201-233.
- Scapens, R.W. and Macintosh, N.B. (1996) 'Structure and agency in management accounting research: A response to Boland's interpretive act', *Accounting, Organisations and Society*, vol. 21, no. 7-8, pp. 675-690.
- Scapens, R.W. and Roberts, J. (1993) 'Accounting and control: a case study of resistance to accounting change', *Management Accounting Research*, vol. 4, no. 1, pp. 1-32.
- Scapens, R., S. Turley, J. Burns, N. Joseph, L Lewis, and Southworth, A. (1996) 'External financial reporting and management information: A Survey of UK Management Accountants'. *Management Accounting Research*, vol . 7, no. 1, pp.73-93.
- Schatzki, T.R. (2001) 'On sociocultural evolution by social selection', *Journal for the Theory of Social Behaviour*, vol. 31, no. 4, pp. 341-364.
- Schatzki, T.R. (2003) 'A new societist social ontology', *Philosophy of the Social Sciences*, vol. 33, no. 2, pp. 174-202.
- Scheuing, D.H. (1974) *New Product Management*, Dryden Press, Hinsdale, Ill.

Schumpeter, J. (1942) *Capitalism, Socialism and Democracy*, London: George Allen and Unwin.

‘Science Technology and Innovation in Europe’ (2008) *Eurostat Publication*
http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-EM-08-001/EN/KS-EM-08-001-EN.PDF

‘Science Technology and Innovation in Europe’ (2011) *Eurostat Publication*
http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-31-11-118/EN/KS-31-11-118-EN.PDF

Seal, W. (2010) ‘Managerial discourse and the link between theory and practice: from ROI to value-based management’, *Management Accounting Research*, vol. 21, no. 2, pp. 95-109.

Sewell, W. (1992) ‘A theory of structure: Duality, agency and transformations’, *American Journal of Sociology*, vol. 98, pp. 1-29.

Shank, J.K. (1989) ‘Strategic Cost Management: New Wine, or Just New Bottles?’, *Journal of Management Accounting Research*, vol. 1, pp. 47.

Shank, J.K. and Govindarajan, V. (1992) ‘Strategic Cost Analysis of Technological Investments’, *Sloan Management Review*, vol. 34, no. 1, pp. 39-51.

Shank, J.K. and Govindarajan, V. (1993), ‘Strategic Cost Management: The Value Chain Perspective’, *Journal of Management Accounting Research*, vol. 4, pp. 179-197.

Shenhar, A.J., Tishler, A., Dvir, D., Lipovetsky, S. and Lechler, T. (2002) ‘Refining the search for project success factors: a multivariate, typological approach’, *R&D Management*, vol. 32, no. 2, pp. 111.

Shields, M.D. (1995) ‘An Empirical Analysis of Firms' Implementation Experiences with Activity-Based Costing’, *Journal of Management Accounting Research*, vol. 7, pp. 148-166.

Shields, M. D. and Young, S. M. (1991) ‘Managing product lifecycle costs: an organisational model’. *Journal of Cost Management*, Fall, pp.39-52.

Siegel, G. and Kulesza, C. S. (1994) ‘The 1994 Practice Analysis of Management Accounting’. *A research project of the Institute of Management Accountants, USA.*

Siegel, G. and Sorensen, J. E. (1999) ‘The 1999 Practice Analysis of Management Accounting’. *A research project of the Institute of Management Accountants, USA.*

Sillince, J.A.A. and Sykes, G.M.H. (1995) ‘The role of accountants in improving manufacturing technology’, *Management Accounting Research*, vol. 6, no. 2, pp. 103-124.

Silverman, D. (2001) *Interpreting Qualitative Data*. 2nd edition, London: Sage Publications.

Simmonds, K. (1982) 'Strategic Management Accounting for Pricing: A Case Example', *Accounting and Business Research*, vol. 12, no. 47, pp. 206-214.

Simons, R. (1987) 'Accounting control systems and business strategy: An empirical analysis', *Accounting, Organisations and Society*, vol. 12, no. 4, pp. 357-374.

Slagmulder, R., Bruggeman, W. and Van Wassenhove, L. (1995) 'An empirical study of capital budgeting practices for strategic investments in CIM technologies', *International Journal of Production Economics*, vol. 40, no. 2-3, pp. 121-152.

Smith, J. A. (2004) 'Reflecting on the development of interpretative phenomenological analysis and its contribution to qualitative research in psychology', *Qualitative Research in Psychology*, vol. 1, no. 1, pp. 39-54.

Smith, P. G. and Reinerstein, D. G. (1991) *Developing Products in Half the Time*, NY: Van Nostrand Reinhold .

Song, X.M. and Parry, M.E. (1997) 'A cross-national comparative study of new product development processes: Japan and the United Kingdom', *Journal of Marketing*, vol. 61, no. 2, pp. 1-10.

'State of the Innovation Union' (2011) *Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions*
<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0849:FIN:en:PDF>

Stones, R. (1996) *Sociological Reasoning: Towards a Post-Modern Sociology*, London: Macmillan

Stones, R. (2001) 'Refusing the realism-structuration divide', *European Journal of Social Theory*, vol. 4, no. 2, pp. 177-197.

Stones, R. (2005) *Structuration Theory*. Basingstone: Palgrave, Macmillan.

Taylor, S. J. and Bogdan, R. (1998) *Introduction to Qualitative Research Methods*, 3rd Edn., NY: Wiley.

Thrift, N. (1985) 'Bear and mouse or bear and tree? Anthony Giddens' reconstruction of social theory', *Sociology*, vol. 19, no. 4, pp.609-623.

Tomkins, C. and Groves, R. (1983) 'The everyday accountant and researching his reality', *Accounting, Organisations and Society*, vol. 8, no. 4, pp. 361-374.

Trott, P. (2005) *Innovation Management and New Product Development*, 3rd Edn., Harlow: Pearson Education Limited

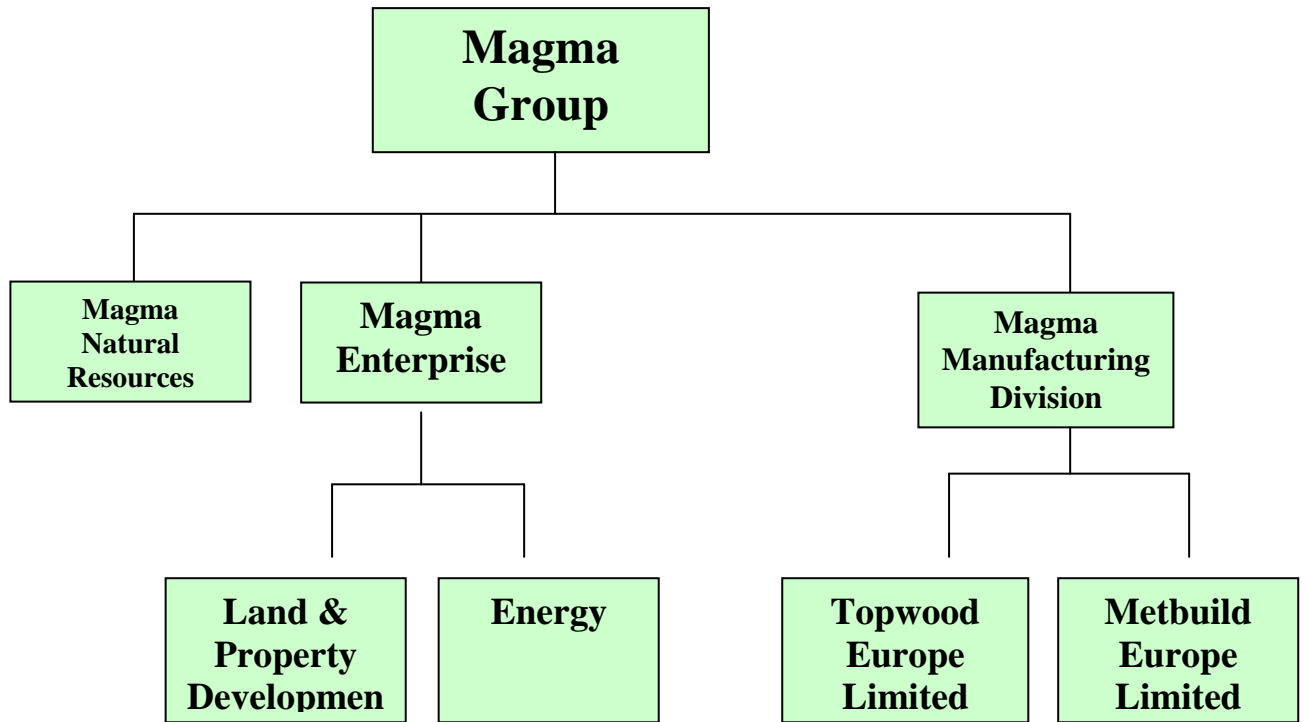
- Truan, F. and Hughes, H. (1999) 'Tradition or enlightenment: philosophical choice in accounting academia', *Journal of Accounting Education*, vol. 17, no. 1, pp. 23-34.
- Trueman, M. and Pike, R. (2006) 'Designing value and valuing design: how accountants work with designers to increase product value'. *CIMA Research Report*, London: CIMA
- Ulrich, K. T., and Eppinger, S. D. (2000) *Product Design and Development*, Boston, MA: Irwin/McGraw-Hill.
- Vaivio, J. (2008) 'Qualitative management accounting research: rationale, pitfalls and potential', *Qualitative Research in Accounting and Management*, vol. 5, no. 1, pp. 64-86.
- Van Manen, M (1990) *Researching Lived Experience- Human Science for an Action Sensitive Pedagogy*, Ontario: The Althouse Press
- Verstegen, B.H.J., De Loo, I., Mol. P., Slagter, K. and Geerkens, H. (2007) 'Classifying controller by activities: an exploratory study', *Journal of Applied Management Accounting Research*, vol. 6, No. 2, pp. 9-32.
- Verworn, B., Herstatt, C. and Nagahira, A. (2008) 'The fuzzy front end of Japanese new product development projects: impact on success and differences between incremental and radical projects', *R&D Management*, vol. 38, no. 1, pp. 1-19.
- Veryzer Jr., R.W. (1998) 'Discontinuous innovation and the new product development process', *Journal of Product Innovation Management*, vol. 15, no. 4, pp. 304-321.
- Whittington, R. (1992) 'Putting Giddens into action: social systems and managerial agency', *Journal of Management Studies*, vol. 29, no. 6, pp. 693-712.
- Willmott, H. (1990) *Labour Process Theory*, NY: Sheridan House Inc
- Wind, J. and Mahajan, V. (1997) *Issues and Opportunities in New Product Development: An Introduction to the Special Issue*, American Marketing Association.
- Yazdifar, H and Tsamenyi, M. (2005) 'Management accounting change and the changing roles of management accountants: a comparative analysis between dependent and independent organisations', *Journal of Accounting and Organisational Change*, vol. 1, no. 2, pp. 180-198.
- Yin, R. K. (2009) *Case Study Research: Design and Methods*, 3rd Edn., London: Sage.
- Zhang, Q. and Doll, W. J. (2001) 'The fuzzy front end and success of new product development: a causal model', *European Journal of Innovation Management*. vol. 4, no. 2, pp. 95-112.

Zoni, L. and Merchant, K. A. (2007) 'Controller involvement in management: an empirical study in large Italian corporations', *Journal of Accounting and Organisational Change*, vol. 3, No. 1, pp. 29-43.

APPENDICES

APPENDIX A

Magma Group Structure



APPENDIX B

Outline Questions for Exploratory Interview with ‘Des’ (Head of Finance) and ‘Pete’ (Head of Operations) in Metbuild in 2007

(Prompts if necessary in italics)

To both

Tell me about the company here in X

Products

Main markets and sectors

Annual turnover

Number of employees

To each

Describe your role in the organisation?

How long have you been here

Where are you situated in the org structure

To Des

Describe the accounting function?

Number of staff

Accounting system

To both

Tell me about NPD here in Metbuild?

Describe the NPD process in the organisation? Does it comprise distinct stages?

Who came up with this process in the first place? Who was involved? Why?

Is it very team oriented comprising large cross-functional teams? Who participates?

To both

Do you use lifecycle costing, target costing, value engineering, quality costing, the balanced scorecard?

Describe approaches where necessary

To Des

Tell me about the involvement of Finance in NPD here in Metbuild?

Where do you fit into the process described above

Do you automatically get involved or do you wait to be called in

What is the extent of your involvement during each key phase

How would you characterize your role?

Refer to use of management accounting tools and techniques

To Pete

How would you describe the involvement of Finance in NPD?

How does the NPD team respond to the involvement of Finance in NPD?

To both

What is the relationship between Finance and the rest of the company generally?

To Pete alone

What do you see the finance function as contributing to the NPD process? Why?

What do you think would be biggest weakness of the finance function in terms of contributing to the process? Why?

Describe the type of involvement you would like finance to have in NPD (if it differs to their current involvement)?

What is preventing this?

Does 'finance' participate on cross-functional teams?

What are 'finance' not doing that they should be doing? Or what are they doing that they shouldn't be doing?

Anything we haven't covered that you think is important?

APPENDIX C

Outline Questions for 2009 Interviews with:

‘Jack’ - Head of Operations – Topwood

‘Nick’ - Managing Director - Topwood

‘Pete’ - Head of Operations – Metbuild ^{Note 1}

‘John’ - Managing Director - Metbuild

Note 1 – Some of the earlier questions were already covered in brief with Pete in the 2007 interview. They were posed again in 2009 with a view to obtaining more detail

(Prompts if necessary in italics)

Tell me about the company here in X

Products

Main markets and sectors

Annual turnover

Number of employees

Would you mind telling me a little about yourself?

Education

Career

What drives you in your day-to-day job?

Describe your role in the organisation?

How long have you been here?

Where are you situated in the org structure?

Tell me about NPD here in Topwood/Metbuild?

In 2007 you had a draft process under review. Has it changed? [Researcher is aware from telephone conversation with Ian that it has] Why? Who was involved in the change?

Who is responsible for this document? How does it work? Who ‘owns’ it?

Who is on the NPD team?

Who is on the Steering Committee?

Could you describe the mechanics for me, talk me through a project for example?

Could you explain how decision-making works?

Could you tell me about your role in NPD and how NPD works on a day-to-day basis for you?

Are you on the NPD Team or the Steering Committee?

Tell me about that? Who else is on it? How does it work? Tell me about decision-making?

And are you in this role for long?

What is your function or role at that stage?

Could you tell me when you use accounting information throughout NPD?
Accounting information is any information that you think is relevant to a financial analysis

Could you identify specifically when you use accounting information during NPD?

Are you preparing it? How do you access it etc?

When you use it most? Why

When you use it least? Why

Are you aware of others using it?

Explain

Steering committee or NPD Team or other

What role does accounting information have in decision-making throughout NPD?

When is accounting information overruled? Should it be overruled more often?

Could you describe the role of Finance in NPD?

Are they on the NPD Team or the Steering Committee?

When do they get involved in NPD?

Is it automatic or do you have to call them in?

What do you see the finance function as contributing to the NPD process? Why?

What do you think would be biggest weakness of the finance function in terms of contributing to the process? Why?

Describe the type of involvement you would like finance to have in NPD (if it differs to their current involvement)?

What is preventing this?

What are 'finance' not doing that they should be doing? Or what are they doing that they shouldn't be doing?

Would you have a strong understanding of accounting related issues?

Would the rest of the company/team?

What would you put that down to?

What's your overall attitude to accounting information in NPD?

Do you welcome it, or resent it? Why?

Are you happy with accounting information during NPD?

Do you convey that back to Finance?

Has the role or relative importance of accounting information in NPD changed for any reason do you think?

Explain

If you could change anything about the role of accounting information, or indeed the role of the Finance function, in NPD here in Topwood/Metbuid, what would you change?

Why? What's preventing this?

Anything we haven't covered that you think is important?

APPENDIX D

Outline Questions for 2009 Interviews with:

‘Paul’ - Head of Finance – Topwood

‘Des’ - Head of Finance – Metbuild ^{Note 1}

Note 1 – Some of the earlier questions were already covered in brief with Des in the 2007 interview. They were posed again in 2009 with a view to obtaining more detail

(Prompts if necessary in italics)

Would you mind telling me a little about yourself?

Education

Career

What drives you in your day-to-day job?

Describe the accounting function?

Number of staff

Accounting system

Describe your role in the organisation?

How long have you been here?

Where are you situated in the org structure?

Tell me about NPD here in Topwood/Metbuild from your perspective?

Describe the NPD process in the organisation? How familiar are you with this document?

Has the NPD process changed? Why? Were you involved with the change?

Could you describe the mechanics for me, talk me through a project for example?

Could you explain how decision-making works?

Could you tell me when accounting information is used throughout NPD?

Accounting information is any information that you think is relevant to a financial analysis

When is it used most? Why

When is it used least? Why

How is this taking place? Are you preparing it/presenting it, is someone else? Why?

Explain?

Would there be a strong understanding of accounting related issues here amongst non Finance personnel?

What would you put that down to?

When is accounting information overruled? Should it be overruled more or less often?

Could you tell me about your role in NPD and how NPD works on a day-to-day basis for you?

Are you on the NPD Team or the Steering Committee?

Tell me about that? Who else is on it? How does it work?

When do you become involved?

Is it automatic or do you get called in?

Tell me about decision-making?

What is your function or role at that stage?

What do you see the finance function as contributing to the NPD process? Why?

Would you like to be more or less involved? What's preventing that?

What do you think the overall attitude is to accounting information in NPD?

Does the rest of the company welcome it, or resent it? Specifics? Why?

Do they convey that back to Finance?

Has the role or relative importance of accounting information in NPD changed for any reason do you think?

Explain

If you could change anything about the role of accounting information, or indeed the role of the Finance function, in NPD here in Topwood/Metbuild, what would you change?

Why? What's preventing this?

Anything we haven't covered that you think is important?

APPENDIX E

Outline Questions for 2010 Interviews with:

‘Alex’ – Director of Sales- MMD

‘Greg’ – Marketing and Business Development Director – MMD

(Prompts if necessary in italics)

Tell me about MMD

Products

Main markets and sectors

Annual turnover

Number of employees

Would you mind telling me a little about yourself?

Education

Career

What drives you in your day-to-day job?

Describe your role in the organisation?

How long have you been here?

Where are you situated in the org structure?

Tell me about NPD from your perspective?

Are you on the NPD Team or the Steering Committee?

Tell me about that? Who else is on it? How does it work? Tell me about decision-making?

Could you explain how decision-making works?

Tell me about the change in the NPD process in recent years?

Why the change? Who was involved? Is it better?

Could you tell me when you use accounting information throughout this process?

Accounting information is any information that you think is relevant to a financial analysis

Could you identify specifically when you use accounting information during NPD

When you use it most? Why

Who provides this? How do you access it etc?

When you use it least? Why

Are you aware of others using it?

Explain

What role does accounting information have in decision-making throughout NPD?

When is accounting information overruled? Should it be overruled more often?

Could you describe the role of Finance in NPD?

When do they get involved in NPD?

Are they on the Steering Committee or the NPD Team?

Is it automatic or do you have to call them in?

What do you see the finance function as contributing to the NPD process? Why?

What do you think would be biggest weakness of the finance function in terms of contributing to the process? Why?

Describe the type of involvement you would like finance to have in NPD (if it differs to their current involvement)?

What is preventing this?

What are 'finance' not doing that they should be doing? Or what are they doing that they shouldn't be doing?

Has the overall role or relative importance of accounting information in NPD changed for any reason do you think?

Explain

Is there anything about Magma and MMD in general and Topwood and Metbuild specifically that you think might impact the NPD process, and specifically the role of accounting information in it?

Draw out any differences in his perception of the two companies- culture, personnel, finance NB

If you could change anything about the role of accounting information, or indeed the role of the Finance function, in NPD, what would you change?

Why? What's preventing this?

Anything we haven't covered that you think is important?

APPENDIX F

Outline Questions for 2010-2011 Interviews with:

‘Simon’ – Head of MMD

‘Max’ – Head of Strategy at Magma

(Prompts if necessary in italics)

Would you mind telling me a little about yourself?

Education

Career

What drives you in your day-to-day job?

Describe your role in the organisation?

How long have you been here?

Where are you situated in the org structure?

Tell me about NPD from your perspective?

Tell me about the evolution of this process over recent years? Why has it changed?

Who is involved? Is it better now? Why?

Are you on the NPD Team or the Steering Committee?

Tell me about that? Who else is on it? How does it work? Tell me about decision-making?

Could you explain how decision-making works?

Could you tell me when you use accounting information throughout this process?

Accounting information is any information that you think is relevant to a financial analysis

When you use it most? Why

Who provides this to you? How do you access it etc?

When you use it least? Why

Are you aware of others using it?

Explain

What role does accounting information have in decision-making throughout NPD?

When is accounting information overruled? Should it be overruled more often?

Could you describe the role of Finance in NPD?

When do they get involved in NPD?

Are they on the Steering Committee or the NPD Team?

Is it automatic or do you have to call them in?

What do you see the finance function as contributing to the NPD process? Why?

What do you think would be biggest weakness of the finance function in terms of contributing to the process? Why?

Describe the type of involvement you would like finance to have in NPD (if it differs to their current involvement)?

What is preventing this?

What are 'finance' not doing that they should be doing? Or what are they doing that they shouldn't be doing?

Has the overall role or relative importance of accounting information in NPD changed for any reason do you think?

Explain

Is there anything about Magma and MMD in general and Topwood and Metbuild specifically that you think might impact the NPD process, and specifically the role of accounting information in it?

Draw out any differences in his perception of the two companies- culture, personnel, finance NB

If you could change anything about the role of accounting information, or indeed the role of the Finance function, in NPD, what would you change?

Why? What's preventing this?

Anything we haven't covered that you think is important?

APPENDIX G

Outline Question for 2010 Interviews with:

'Bill' – Chief Executive of Magma

(Prompts if necessary in italics)

Would you mind telling me a little about yourself and your role here?

Education

Career

Role in the organisation

What drives you in your role?

Tell me about NPD in Magma?

How familiar are you with the process?

Are you familiar with this formal document and the evolution of this document?

If yes, explain why the change?

Are you a member of the Steering Committee?

Tell me how that works?

Who else is on it?

How are decisions made?

On what basis are decisions made?

Could you tell me when you think accounting information is important in this process?

Accounting information is any information that you think is relevant to a financial analysis

Most important? Why

Least important? Why

When is accounting information overruled? Should it be overruled more/less often?

Could you describe the role of Finance in NPD?

Are they on the Steering Committee? Why?

What do you see the finance function as contributing to NPD? Why?

What do you think would be biggest weakness of the finance function in terms of contributing to NPD? Why?

Describe the type of involvement you would like finance to have in NPD (if it differs to their current involvement)?

What is preventing this?

What are 'finance' not doing that they should be doing? Or what are they doing that they shouldn't be doing?

Has the role or relative importance of accounting information in NPD changed for any reason do you think?

Explain

Is there anything about Magma in general and Topwood and Metbuild specifically that you think might impact the NPD process, and specifically the role of accounting information in it?

*Draw out any differences in his perception of the two companies- culture, personnel, finance **NB***

If you could change anything about the role of accounting information, or indeed the role of the Finance function, in NPD, what would you change?

Why? What's preventing this?

Anything we haven't covered that you think is important?

APPENDIX H

Outline Questions for 2011 Interview with:

'Ian' – Chief Financial Office or Magma

(Prompts if necessary in italics)

Would you mind telling me a little about yourself and your role here?

Education

Career

Role in the organisation

What drives you in your role?

Tell me about NPD from your perspective?

Tell me about the evolution of this process over recent years? Why has it changed? Who is involved? Is it better now? Why?

Are you on the Steering Committee?

Tell me about that? Who else is on it? How does it work? Tell me about decision-making?

Could you explain how decision-making works?

Could you tell me when you think accounting information is important in NPD?

Accounting information is any information that you think is relevant to a financial analysis

Most important? Why

Least important? Why

When is accounting information overruled? Should it be overruled more often?

Could you describe the role of Finance in NPD in the individual companies?

Are they on the Steering Committee or the NPD Team?

What do you see the finance function as contributing to NPD? Why?

What do you think would be biggest weakness of the finance function in terms of contributing to NPD? Why?

Describe the type of involvement you would like finance to have in NPD (if it differs to their current involvement)?

What is preventing this?

What are 'finance' not doing that they should be doing? Or what are they doing that they shouldn't be doing?

What do you think the overall attitude is to accounting information in NPD?

Does the rest of the company welcome it, or resent it? Specifics? Why?

Do they convey that back to Finance?

Would there be a strong understanding of accounting related issues around the group?

What would you put that down to?

Is there anything about Magma in general and Topwood and Metbuild specifically that you think might impact the NPD process, and specifically the role of accounting information in it?

Draw out any differences in his perception of the two companies- culture, personnel, finance

NB

Has the overall role or relative importance of accounting information in NPD changed for any reason do you think?

Explain

If you could change anything about the role of accounting information, or indeed the role of the Finance function, in NPD what would you change?

Why? What's preventing this?

Anything we haven't covered that you think is important?

APPENDIX I

Contents of case study database

No.	Item	Date
1	Interview transcript and notes - 'Des' & 'Pete' - Metbuild	23 May 2007
2	1 st generation Draft NPD Process document- received from 'Pete' in Metbuild (<i>copy at appendix P</i>)	23 May 2007
3	Memo prepared by researcher of telephone conversation with 'Ian' from Magma Group HQ	25 May 2007
4	Organisational charts- received by e-mail from 'Ian' at Magma Group HQ	25 May 2007
5	Magma <i>Internal</i> Information Memorandum prepared by Magma HQ for banks re financing- received by e-mail from 'Ian' at Magma Group HQ	25 May 2007
6	Interview Transcript and Notes- 'Paul' - Topwood	28 July 2009
7	Interview Transcript and Notes- 'Jack' - Topwood	28 July 2009
8	1 st generation NPD Process Document completed for <i>BuildSafe</i> product launch, together with back up schedules - received from 'Jack' in Topwood	28 July 2009
9	2 nd generation Draft NPD Process Document- received from 'Jack' in Topwood (<i>copy at appendix Q</i>)	28 July 2009
10	Interview Transcript and Notes- 'Nick' - Topwood	4 Sep 2009
11	Interview Transcript and Notes- 'Pete' - Metbuild – 2 nd interview	3 Dec 2009
12	Interview Transcript and Notes- 'Des' - Metbuild - 2 nd interview	3 Dec 2009
13	2 nd generation NPD Process Document completed for <i>Ebuild</i> to stage 4, together with back up schedules - received from 'Des' in Metbuild	3 Dec 2009
14	Interview Transcript and Notes- 'John' - Metbuild	11 Dec 2009

15	Magma 2008 Annual Report-printed from web-site	11 Dec 2009
16	Interview Transcript and Notes- 'Alex'- MMD	26 Feb 2010
17	Interview Transcript and Notes- 'Greg'- MMD	9 Apr 2010
18	Variety of industry relevant promotional MMD material received from Greg	9 Apr 2010
19	Memo prepared by researcher of telephone conversation with 'Ian' from Magma Group HQ	25 Apr 2010
20	Magma 2009 Annual Report- received by e-mail from 'Ian' at Magma Group HQ, subsequently published on website	25 Apr 2010
21	Interview Transcript and Notes - 'Bill' - Magma Chief Executive	20 Dec 2010
22	Interview Transcript and Notes - 'Simon' - Head of MMD	13 Jan 2011
23	Interview Transcript and Notes - 'Max'- Magma Head of Strategy	13 Jan 2011
24	Interview Transcript and Notes - 'Ian' - Magma Head of Finance	13 Jan 2011
25	Magma 2010 Annual Report- received from 'Ian' at Magma Group HQ, subsequently published on website	13 Jan 2011
26	Magma 2010 Board Report- received from 'Ian' at Magma Group HQ	13 Jan 2011
27	Magma <i>Internal</i> Document entitled 'Defining Magma's Weighted Average Cost of Capital 2010' prepared by Magma HQ for external audit - received from 'Ian' at Magma Group HQ	13 Jan 2011

APPENDIX J

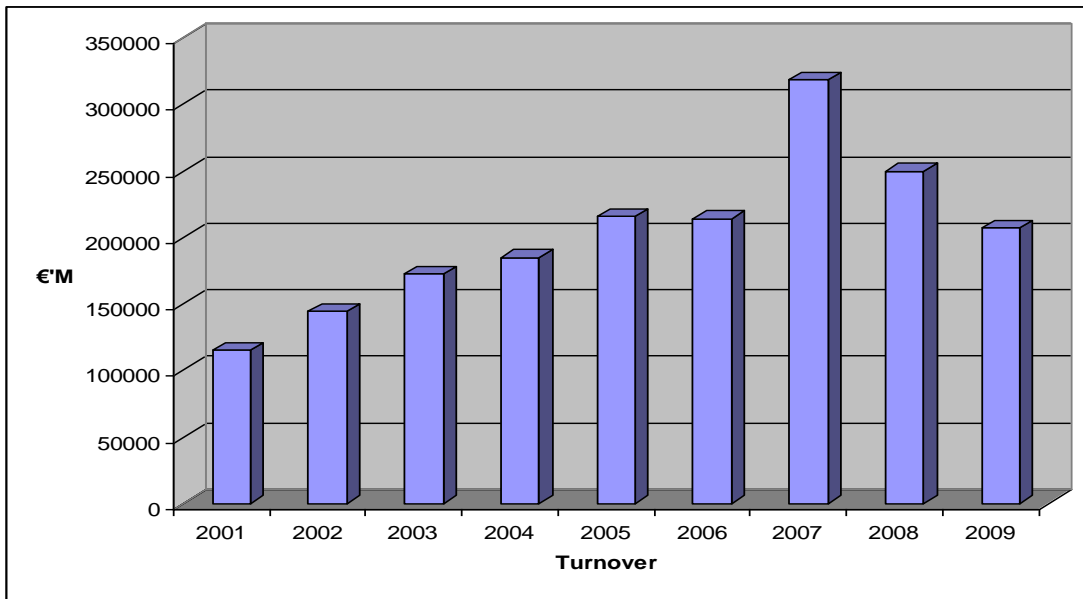
Case Study Timeline

<p>Empirical lit review and initial dev of prelim res obj 'role of Finance in NPD'</p>	<p>Sep – Dec 2006</p>
<p>Initial development of philosophical and methodological perspective, preliminary exploration of theoretical frameworks</p>	<p>Jan – Apr 2007</p>
<p>Analysis of exploratory interviews and documentation, revision of obj from role of Finance in NPD to role of acc info in NPD, refinement of search for theoretical frameworks, focus on institutional theory, subsequent recognition of limitations of institutional theory</p>	<p>Apr 2007 Intro to case site via 'Ian' and prep for introductory interviews at Metbuild</p>
	<p>May 2007 Metbuild site-tour Interviewed Des and Pete at Metbuild Internal doc from Pete and Ian</p>
	<p>Duration 2008</p>
<p>Preliminary examination of structuration theory</p>	<p>Jan – Jun 2009</p>
	<p>Jun 2009 Picked up contact with case company via 'Ian' and prep for interviews</p>
	<p>Jul – Sep 2009 Interviewed Paul, Jack and Nick at Topwood Topwood site tour Internal doc from Jack</p>

Preliminary analysis of Topwood interviews & documentation	Sep – Oct 2009		
Further examination of structuration theory	Oct – Nov 2009	Oct – Nov 2009	Prep for interviews
		Dec 2009	Interviewed Des, Pete and John at Metbuild Internal doc from Des
Analysis of Metbuild interviews & documentation	Dec 2009 – Feb 2010	Feb – Apr 2010	Interviewed Alex and Greg at MMD Telephone conversation and Internal doc from Ian
		Dec 2010 – Jan 2011	Interviewed Simon at MMD Interviewed Max at MMD Interviewed Bill at Magma HQ Interviewed Ian at Magma HQ Internal doc from Ian
Extensive analysis of all data using struncturation theory	Jun 2010 – Jan 2011		
Prep of case study report – chapter 5	Jan – Jun 2011		
2 nd stage extensive analysis of all data using structuration theory	Jun – Oct 2011		
Discussion	Oct 2011 – Jun 2012		

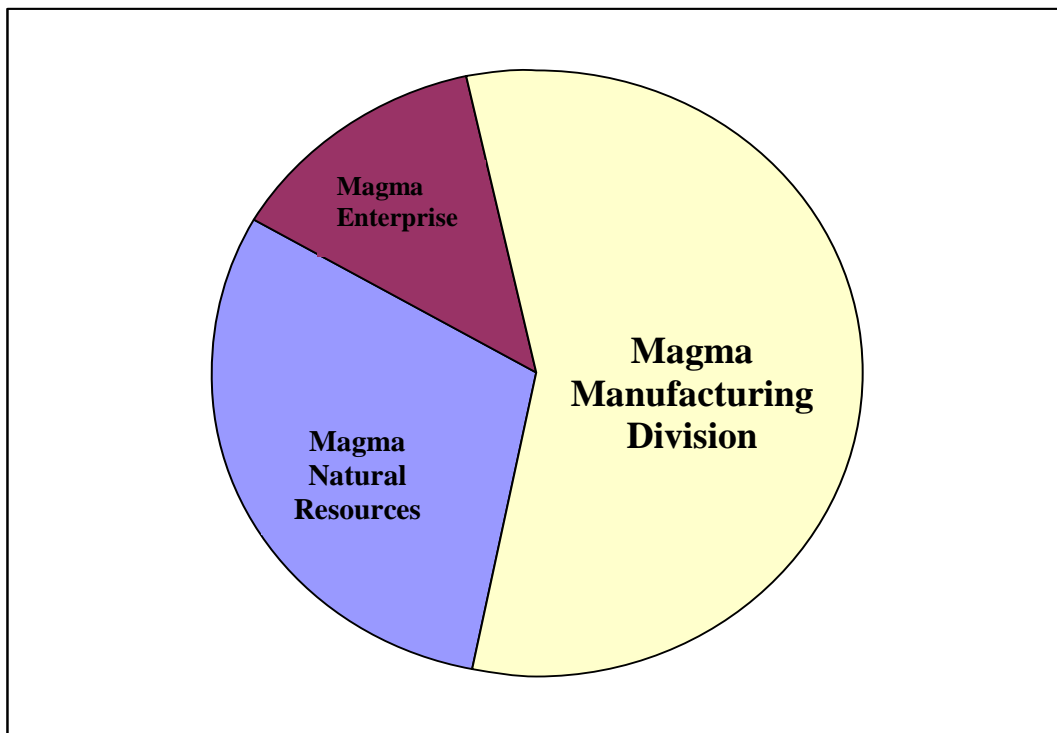
APPENDIX K

Magma Group Turnover 2001-2009



APPENDIX L

Magma Group 2010 Turnover by Division



APPENDIX M

Magma Group Key Financial Indicators 2006-2010

	2006	2007	2008	2009	2010
	<i>€'000</i>	<i>€'000</i>	<i>€'000</i>	<i>€'000</i>	<i>€'000</i>
Turnover	215,673	213,789	318,128	249,475	206,865
EBITDA	59,155	51,631	86,915	54,708	48,948

The Magma group capitalised significantly on the building boom in Ireland and the UK in 2008 with market demand for construction products exceeding manufacturing capacity. However, Magma's group turnover has fallen by an average of 16% per annum since 2008, principally due to the decline of the construction industry. Economic conditions would have led to lower profits had the group not implemented a range of rigorous cost reduction measures throughout each division of the organisation during 2009.

APPENDIX N

Topwood Alpha products in use



Alpha hoarding products have been used as site protection for a number of large development projects in the UK including the construction of several Tesco eco-stores, the annual Glastonbury festival and the London Olympic development. Alpha wall sheathing, roofing and flooring products have been utilized in a range of affordable residential developments throughout Ireland and the UK.

Metbuild Beta products in use



Beta products have been used for numerous large scale fit out projects including the Copenhagen Concert Hall, the Wales Millennium Centre, the Hermitage Museum in Amsterdam, the Manchester Civil Courthouse as well as several shopping centers throughout Europe.

APPENDIX O

Topwood Financial Performance 2006-2010

<i>'000</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>
<i>Turnover</i>	73,229	71,411	75,091	56,522	45,559
<i>EBITDA</i>	5,511	4,190	7,469	(2,186)	(6,187)

Metbuild Financial Performance 2006-2010

<i>'000</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>
<i>Turnover</i>	79,112 *	92,945*	111,086	83,967	71,059
<i>EBIT DA</i>	10,853 *	14,454*	29,878	6,063	(2,635)

[Magma purchased Metbuild in November 2006]*

APPENDIX P

May 2007

MAGMA MANUFACTURING DIVISION NEW PRODUCT DEVELOPMENT PROCESS DOCUMENT

Stages 1-7

- 1. Concept Generation**
- 2. Concept Screening**
- 3. Concept Development & Testing**
- 4. Business Analysis**
- 5. Beta and Market Testing**
- 6. Technical Implementation**
- 7. Commercialisation**

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
1. Concept Generation

Project Name _____ **Project ID No.** _____ **Date** _____

Submitted by _____

The objective of the Concept Generation Stage is to

- set on record the origin(s) of the product / concept
- define or categorise it in general terms

	Category	Source eg. Customer Request, Competitor Offering, Market research, Internal Ideation, etc.	Details eg. Name(s) of Customer, Employee, Competitor, etc.
1	New to World (Blue Sky)		
2	New Product Line		
3	Augmentation of Existing Product Line		
4	Process Optimisation		
5	Reposition		

All products and concepts generated must proceed to the next Stage of Concept Screening

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
2. Concept Screening

Project Name:

Date:

The objective of Concept Screening is to avoid devoting scarce resources to unsound / inappropriate concepts or products. Through this process the NPD Committee / Team will:-

- evaluate potential concepts or products.
- Decide whether it is a "go" or "no go"
- Prioritise projects

	Please Check the Following Criteria	No	Not sure	Yes	Comments
1	Defined Concept / Product Specification				
2	Actual consumer / end-user benefit				
3	Target price estimated and realistic				
4	Manufacturing cost estimated and realistic				
5	More profitable than existing products				
6	Manufacturing capability (in-house / external)				
7	Resources required to advance this project have been estimated ie. Capital, Technical, Financial etc and are reasonable and available				
8	EHS issues have been considered and present no problems				
9	Strategic fit with CPP plans				
10	Product liability issues are manageable				
11	Clear identifiable Market and Sales potential				
12	Route to market and marketing costs (including IP potential) manageable				

Please review individual scores and as a group and reach a consensus.

If any criterion has a "No" response , the project must be stopped

If there is a "Not sure" response, the project team will try to clarify the uncertainty and this Stage is repeated

If all responses are "Yes" the project continues to stage 3, Concept Development and Testing.

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
3. Concept Development & Testing

This is a mechanism to review, answer and rank decisive criteria for prioritisation of finite resources. It can then be used to prioritise NPD concepts or projects to be evaluated further.

Product Evaluation and Ranking Matrix:

Product: _____ *Date* _____

Product Success Requirement	Relative weighting	Score (1 - 10)	Rating	Comments
What is the anticipated ROI ?				
Will the product will be sold through existing distribution base?				
What degree of capital investment is required?				
How dependent is the product development on internal technical resource?				
Can sales be managed by the existing skill-set?				
Can we protect the product with patents/intellectual property?				
What level of marketing investment is required?				
Total				

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
4. Business Analysis

Year	1	2	3	4	5
<i>Sales Volume</i>					
Sales Price					
Margin					
% Return					
Breakeven					
Payback					

Please attach detailed backup including:

- Equipment, building and installation Costs.
- Costs of production, fixed and variable.
- Sales price including discounts, rebates and variable overhead.
- Distribution and storage costs fixed and variable.
- Marketing costs including advertising and promotion.
- Sales Analysis and Projections

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
5. Beta and Market Testing

A. Prototype (tick appropriate) Attach pictures.

Full size _____ Sample size _____ Mock Up _____ Other _____

Date available _____

B. Testing

Test No.	Location (and client name if applicable)	Size (no. panels, m2, etc)	Date From	Date To	Results / Comments

C. Customer Response

How Measured (Attach forms, questionnaire, reports as appropriate). Which of the following used?

Focus Group Y/N **Customer Interview** Y/N **Survey / Questionnaire** Y/N **Trade Show** Y / N **Other** please describe:

D. What adjustments were made following the initial tests and surveys?

- (i) **To the Product**
- (ii) **To the Process**
- (iii) **To the Market Research**

E. Re-Testing (if applicable)
As per A to C above.

F. Critical Review

It is essential to revisit the questions posed in Section 2 in the light of new information learned during sections 3, 4 and 5 above. The difference now is that “Don’t Know” is not an option and a “No” means the process stops here.

	Please Check the Following Criteria	No	Yes	Comments
1	Defined Concept / Product Specification			
2	Actual consumer / end-user benefit			
3	Target price estimated and realistic			
4	Manufacturing cost estimated and realistic			
5	More profitable than existing products			
6	Manufacturing capability (in-house / external)			
7	Resources required to advance this project have been estimated ie. Capital, Technical, Financial etc and are reasonable and available			
8	EHS issues have been considered and present no problems			
9	Strategic fit with CPP plans			
10	Product liability issues are manageable			
11	Clear identifiable Market and Sales potential			
12	Route to market and marketing costs (including IP potential) manageable			

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
6. Technical Implementation

CHECKLIST

Resources required (People, Financial, etc) defined and Critical Path developed? Yes / No

Requirements / Resource plan published? Yes / No

Engineering Operations Plan in place? Yes / No

Supplier selection and collaboration (tendering as appropriate) concluded? Yes / No

Contingencies defined and costed? Yes / No

Essential certifications identified and under control? Yes / No

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
7. Commercialization

CHECKLIST

Product Launch Plan in place? Yes / No

- A. Advertising and promotion plan defined and published? Yes / No
- B. Distribution plan and stocking programme agreed? Yes / No
- C. Critical path agreed and published? Yes / No

APPENDIX Q

July 2009

MAGMA MANUFACTURING DIVISION NEW PRODUCT DEVELOPMENT PROCESS DOCUMENT

Stages 1-10

- 1. Challenge & Concept Definition**
- 2. Early Screening by NPD Steering Committee**
- 3. Market Analysis**
- 4. Project Scope Definition**
- 5. Prototype Development & Testing**
- 6. Preliminary Financial & Business Case Analysis**
- 7. Market Testing**
- 8. Business Analysis**
- 9. Technical Implementation Check List**
- 10. Commercialisation Check List**

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
1. Concept Generation

Project Name _____ **Project ID No.** _____ **Date** _____

Submitted by _____

The objective of the Challenge & Concept Definition Stage is to

- Outline the challenge "what do we want to achieve?"
- Record the origin(s) of the product/concept
- Define concept in general terms

Challenge:

Objectives	What we hope to achieve?
Strategic	
Customer	
Market	
Cost Base	

Concept Definition:

	Category	Source eg. Customer Request, Competitor Offering, Market research, Internal Ideation, etc.	Details eg. Name(s) of Customer, Employee, Competitor, etc.
1	New to World (Blue Sky)		
2	New Product Line		
3	Augmentation of Existing Product Line		
4	Process Optimisation		
5	Reposition		
6	New Product Service Offering		

All products and concepts generated must proceed to the next Stage of Concept Screening

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
2. Early Screening by NPD Steering Committee

Project Name:

Date:

Early Screening by the NPD Steering Committee is designed to avoid devoting scarce resources to unsound / inappropriate concepts or products. Through this process the NPD Committee / Team will:-

- evaluate potential concepts or products.
- Decide whether it is a "go" or "no go"
- Prioritise projects

	Please Check the Following Criteria	No	Not sure	Yes	Comments
1	Defined Concept / Specification / Scope				
2	Identifiable Market & Sales Potential				
3	Market Value Proposition				
4	High Level Quantitative Assessment				
5	Strategic Fit with CPP Plans				
6	Assign Sales & Marketing Resources for Further Analysis				

If any criterion has a "No" response , the project must be stopped

If there is a "Not sure" response, the project team will try to clarify the uncertainty and this Stage is repeated

If all responses are "Yes" the project continues to stage 3, Market Analysis.

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
3. Market Analysis

Project Name:

Date:

	Please Check the Following Criteria	No	Not sure	Yes	Comments
1	Defined concept / Product specification				
2	Key focus areas identified for further study				
3	Market place consultation & feedback on concept (RIPT observation)				
4	Concept storyboard developed				
5	Identifiable market and sales potential				
6	End-user benefit defined/quantified				
7	Market value proposition				
8	Market penetration and volumes				
9	Market segmentation				
10	Route to market and marketing costs (including IP potential)				
11	Product liability issues are manageable				
12	Assign project team for RIPT implementation				

Please review individual scores and as a group and reach a consensus.

If any criterion has a "No" response, the project must be stopped

If there is a "Not sure" response, the project team will try to clarify the uncertainty and this Stage is repeated

If all responses are "Yes" the project continues to stage 4, Project Scope Definition.

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
4. Project Scope Definition

	Please Check the Following Criteria	No	Yes	Comments
1	Key insights defined and discussed with stakeholders			
2	Input received from :			
	Sales and marketing			
	Customer base			
	Manufacturing and technical Resources			
3	Manufacturing capability (in-house/external)			
4	EHS issues have been considered and present no problems			
5	Project scope defined			
6	Project funding defined			
7	Project implementation plan drawn up			

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
5. Prototype Development & Testing

A. Prototype (tick appropriate) Attach pictures.

Laboratory-scale production of product test samples and analysis of product performance, i.e. certification testing, weathering tests, etc...

Definition of product manufacturing recipes and costs

Full size _____ Sample size _____ Mock Up _____ Other _____

Date available _____

B. Testing

Test No.	Location (and client name if applicable)	Size (no. panels, m2, etc)	Date From	Date To	Results / Comments

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
6. Preliminary Financial/Business Case Analysis

	Please Check the Following Criteria	No	Not sure	Yes	Comments
1	Target price estimated and realistic				
2	Marketing Investment Estimate				
3	Manufacturing cost estimated and realistic				
4	Resources required to advance this project have been estimated ie. Capital, Technical, Financial etc and are reasonable and available				
5	Capex & ROI estimate provides compelling business case				
6	Approval to proceed to market testing and further development of business case				

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
7. Market Testing

1) Beta Testing:
Summary of Findings:

Test No.	Location (and client name if applicable)	Size (no. panels, m2, etc)	Date From	Date To	Results / Comments

2) Customer Response

How Measured (Attach forms, questionnaire, reports as appropriate). Which of the following used?

Focus Group Y/N **Customer Interview** Y/N **Survey / Questionnaire** Y/N **Trade Show** Y / N **Other** please describe:

3) Does the market Test support the key data?

- Target price
- Volume
- Customer satisfaction

4) What adjustments were made following the initial tests and surveys?

- a. To the Product
- b. To the Process
- c. To the Market Research

5) Re-Testing (if applicable)

As per A to C above.

6) **Critical Review**

It is essential to revisit the questions posed in Section 2 in the light of new information learned during sections 3, 4 and 5 above. The difference now is that “Don’t Know” is not an option and a “No” means the process stops here.

	Please Check the Following Criteria	No	Yes	Comments
1	Defined Concept / Product Specification / Scope Definition			
2	Market assumptions/ estimates valid?			
3	Target price estimated and realistic			
4	Clear identifiable market and sales potential			
5	Route to market and marketing costs (including IP potential) manageable			
6	Product liability issues are manageable			
7	Manufacturing cost estimated and realistic			
8	Manufacturing capability (in-house / external)			
9	Resources required to advance this project have been estimated ie. Capital, Technical, Financial etc and are reasonable and available			
10	EHS issues have been considered and present no problems			
11	Strategic fit with CPP plans			

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
8. Business Analysis

Year	1	2	3	4	5
<i>Sales Volume</i>					
Sales Price					
Margin					
% Return					
Breakeven					
Payback					

Please attach detailed backup including:

- Equipment, building and installation Costs.
- Costs of production, fixed and variable.
- Sales price including discounts, rebates and variable overhead.
- Distribution and storage costs fixed and variable.
- Marketing costs including advertising and promotion.
- Sales Analysis and Projections

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
9. Technical Implementation Checklist

Resources required (People, Financial, etc) defined and Critical Path developed? Yes / No

Requirements / Resource plan published? Yes / No

Engineering Operations Plan in place? Yes / No

Supplier selection and collaboration (tendering as appropriate) concluded? Yes / No

Contingencies defined and costed? Yes / No

Essential certifications identified and under control? Yes / No

Magma Manufacturing Division
NEW PRODUCT DEVELOPMENT
10. Commercialisation Checklist

Product Launch Plan in place? Yes / No

- A. Advertising and promotion plan defined and published? Yes / No
- B. Distribution plan and stocking programme agreed? Yes / No
- C. Critical path agreed and published? Yes / No