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The Process of Organisational Learning and its Value for Organisational
Performance: An Empirical Study

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by

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Abstract

Organisational learning has been advocated as a key enabler of organisational performance improvement. However, despite over half a century of research, such claims attributed to organisational learning cannot be adequately verified. To date, the field is fragmented where agreement is not evident on even the fundamental aspects such as the definition or process. It has been proposed that the organisational learning concept may outlive its usefulness unless these anxieties are addressed. To ameliorate these anxieties, it was argued that further empirical research utilising carefully constructed methodologies needs to be conducted to help validate the claims attributed to organisational learning. The following research addresses this need by empirically studying organisational learning and evaluated the concepts value for organisational performance. A researchable organisational learning model was developed and extended to include a link with organisational performance. The rationale of the developed model proposed that organisational learning, in comparison to individual learning, aids a broader understanding of the business environment and the formation of a shared vision which provides the basis for unified action leading to organisational performance improvement. The proposal was then longitudinally tested in four organisations with senior and departmental managers by utilising a causal cognitive mapping method. The findings suggest that there is value in the organisational learning concept and the process should be fostered within organisations for potentially improved organisational performance. However, the results also advise caution in that barriers to effective organisational learning, such as cognitive inertia, need to be recognised and addressed. The research concludes that organisational learning can be potentially beneficial to an organisation and provided some empirical support for the concept that has been argued to be lacking.

Acknowledgements

For Joanne, Sam, Leo, Mum and Dad

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CHAPTER 1

1. Introduction and Background

1.1 THE RESEARCH CONTEXT AND IMPORTANCE

The idea of learning being crucial for organisational survival has developed from an established pedigree that can be traced back to the genesis of organisational studies (e.g. Marshall, 1890). Evolving from the importance of individual learning in organisations emerged the concept that organisations themselves could learn (Cyert and March, 1963) in ways that were independent of any particular individual and this 'organisational learning' was crucial for organisational performance improvement (Friedman, 2005). The concept of organisational learning (OL), although originating from the 1930s (Argote, 1999), gained particular recognition in the late 1980s and early 1990s through popularising works by influential writers such as Stata (1989) and Senge (1990). Peter Senge (1990) advocated OL as being a major source of competitive advantage for organisations in the future and after reviewing the OL literature of the time, Dixon (1992 p.29) wrote that learning is "the critical competency of the 1990's". Later, Argyris wrote in the prologue to the enticingly titled book 'OL and Competitive Advantage' (Moingeon and Edmonson, 1996) that all management theories are about taking action to achieve goals and a major claim is that OL is key to achieving these goals.

Since this time interest in OL has grown in the academic literature exemplified by a *Web of Science* database search by Bapuji and Crossan (2004) which noted that a search for the term 'organizational learning' resulted in 4 articles in 1990 and 98 in 2002. A search by the author utilising the same criteria resulted in 282 articles in 2006. OL has also shown growth in the business world because, as Chiva and Alegre (2005

p.49) state, "...the new characteristics of the business world, together with [the] extensive analytical value of organizational learning in contributing to the improvement of the understanding of organizations and their activities, are both of great significance". Friedman *et. al.* (2005 p.19) recognised the importance of the OL concept by declaring that "Today there seems to be little question that organizations can learn and that learning is essential for long term survival".

Despite this growth the benefit of the OL concept has been questioned.

Edmonson and Moingeon (1996 p.17) write that "Given the variety of definitions of organizational learning and the different processes described in the literature, scepticism must accompany the simple proposition, 'OL is a source of competitive advantage'". These authors propound that learning is often presented as a source of competitive advantage but definitions and mechanisms involved in achieving this advantage are not specified and importantly little empirical evidence has been presented to support this claim. This sentiment continued to surround OL as Templeton *et. al.* (2004) emphasised when noting that despite its heavy influence in the annals of academia and management practice, the concept of OL remains stagnant in terms of utility.

Concomitant with the OL concept developing and flourishing into a distinct discipline, so to did the debate that enveloped the construct. Research on OL remains to a large extent fragmented. Contributors differ in their definitions of OL, the OL process, approach the concept from a wide variety of perspectives, and disagree on where the focus of OL lies (*e.g.* Huber, 1991; Dodgson, 1993; Crossan *et al.*, 1995; Westley, 1996; Crossan *et al.*, 1999; Easterby-Smith, 1997; Edmondson and Moingeon, 1998; Prange, 1999; Weick and Pawlowsky, 2001; DeFillippi and Ornstein, 2003; Friedman *et al.*, 2005; Hong *et. al.*, 2006; Shipton, 2006). Visser (2007 p.659) remarked that "...organization scholars have not successfully established consensus on the concepts

and terminology of organizational learning. In fact, the opposite seems to be occurring. Many observers see a proliferation of different concepts and meanings, leading to a veritable “organizational learning jungle”.

Exploring the process and testing the utility of OL is important for the development of the concept. Friedman *et al.* (2005 p.27) concurred with this view and claimed that demystifying OL requires “developing models that create clear and observable links between concepts and organizational action”. An accepted method of how scientific fields have traditionally overcome such fragmentation is through systematic empirical investigation of the various models and careful testing of theories and hypotheses to either provide support for, or evidence contrary to, that purported by the creators of the models. Empirical research has the ability to provide a foundation for integration and cohesion and hence, advancement of this important research area. However, there has traditionally been a lack of empirical work in the OL domain.

It has been proposed that the OL concept may outlive its usefulness unless further empirical and theoretical work can ameliorate a number of anxieties (Williams, 2001). The recognition of the need for more empirical studies in the OL field dates back at least as far as Fiol and Lyles (1985) and has remained a consistent call for over twenty years (*e.g.* Fiol and Lyles, 1985; Huber, 1991; Miner and Mezias, 1996; Easterby-Smith and Araujo, 1999; Arthur & Aiman-Smith, 2001 Dyck *et. al.*, 2005). Lahteenmaki *et. al.* (2001 p.126) declared:

...searching for the empirical testing of OL claims, hypotheses and arguments turns out to be futile. We found practically no testing at all, as well as poor validation of existing OL arguments. New models of learning organisations are presented one after the other, even though there is as yet no specific way to define organisational learning: there is an evident lack of comprehensive and systematic empirical research and already several writers have warned researchers and practitioners about over enthusiasm about theory development, whilst, at the same time emphasising the need to verify the theories already in existence (Cummings and Worley, 1997; Fiol and Lyles, 1985; Kirjavainen, 1997; Miner and Mezias, 1996)

Reasons for the slow growth of empirical work have been cited as being because of the fragmented nature of the field itself which has meant that there is insufficient theoretical coherence to encourage theory testing (Vince *et al.*, 2002), the fact that the concept itself is still vague and the lack of valid and reliable measures (Easterby-Smith *et al.*, 2000). Indeed, Arthur and Aiman-Smith (2002 p.739) state that “operationally defining and measuring organisational learning in empirical research has proven to be excruciatingly hard to do”. These reasons do not preclude empirical studies, in fact, Lahteenmaki *et. al.* (2001 p. 213) write that these reasons highlight the need for empirical research “since the theory is highly dispersed and does not really build on earlier findings, rich empirical studies are needed in order to validate measures of organisational learning”. Miner and Mezias (1996) recognised that good empirical research had proven difficult, however, this does not mean the aspiration for high quality work of this kind should be lowered, and add that the conception of learning as a practical vision among managers further heightens the need for such rigorous empirical work. Hodgkinson and Sparrow (2002 p.330) recognise Easterby-Smith and Araujo (1999) as drawing attention to the need to build empirical support for the relevance of organisational learning and claim this is “a goal we wholeheartedly support”.

An optimistic note was provided by Bapuji and Crossan (2004) with a review of OL research that concluded empirical research has been, and can be, successfully conducted. These authors claim that this type of work has shown growth and has provided useful insights and raised various questions that need to be researched for a better understanding of the field. In identifying future research directions Bapuji and Crossan (2004 p.410) add to the call for “... a stronger and more cogent discussion on how learning can yield performance”. This appeal is supported by Easterby-Smith and Lyles (2003) who noted that experts in the field of OL agree on many emerging areas

and that of critical importance is the development of better methods for measuring learning processes and knowledge and for evaluating the impact of learning on organisations and their performance. However, analysing the empirical studies that have appeared in the literature dealing with the OL and organisational performance relationship reveals that they have predominantly been grounded in the behavioural leaning approach utilising a questionnaire survey methodology (e.g. Bontis *et. al.*, 2002; Prieto and Revilla, 2006; Aragon-Correa *et. al.*, 2007; Skerlavaj *et. al.*, 2007). However, this approach has been criticised because for not capturing the complexities of learning and not taking into account how learning occurs over time (Yeo, 2002).

The main emphasis of OL is that there are associated benefits for the organisation and frequently these benefits are related to performance outcomes leading to competitive advantage. Given the debate and scepticism, it is important for the OL concept that further empirical research, utilising carefully constructed methodologies, is conducted to validate some of the claims attributed to it and provide insights into the process.

1.2 RESEARCH AIM

The following research aims to empirically study the process of organisational learning and evaluate the value for organisational performance improvement.

1.3 THE RATIONALE AND AN OVERVIEW OF THE THESIS

The remainder of this chapter reviews the literature on OL and the contributions that have focused on the OL/organisational performance relationship. An overview of the emergence and conceptualisations of OL revealed that the concept has a long lineage yet remains diverse and fragmented. The limited existing empirical attempts that

study the relationship between OL and organisational performance utilise varying, and in some cases arguably simplistic, conceptualisations of OL and organisational performance which has resulted in a far from established unequivocal link between OL and organisational performance. The chapter concludes by proposing that further empirical investigations utilising carefully constructed methodologies have the ability to provide a foundation for integration and cohesion and hence, advancement of this important research area.

Chapter 2: Development of a Research Foundation

A foundation for researching OL is developed by differentiating OL from the learning organisation, knowledge management and organisational knowledge concepts and assessing the dominant perspectives utilised within the field. The social learning perspective is dismissed as not being appropriate to the goals of this research, whilst recognising the value of this approach in the OL field. Behaviourism was more suited to meeting the requirements of this research, but the major concern was the fundamental assumption that behaviour change means learning. It was concluded that the cognitive perspective is the most fitting perspective for the purpose of this research.

Chapter 3: Development of a Model of Organisational Learning

A model of OL is developed based upon established theory that can be examined to provide insights into the process of OL. The chapter begins by arguing that the individual is the basis for OL as individuals are the only organisational actors capable of learning by means of mental activity. Learning is then defined as acquiring two types of knowledge, know-how and know-why, both of which are needed for effective action. The means by which individuals acquire this knowledge is described by Kolb's (1984)

experiential learning theory. Added to this are mental models, active memory structures which represent an individual's interpretation of the world and from which action is directed. Based upon the proposition that learning requires the acquisition of two types of knowledge, the concept of a hierarchy of learning levels, lower-level and higher-level, that individuals can undertake is proposed and it was argued that both are necessary for organisational effectiveness. Shared mental models were identified as being a fundamental component of OL. Shared mental models emerge when individual mental models are made explicit through social processes and develop as a unique entity in any group of individuals with three or more members and, just like individual mental models, are a basis for action. In an organisational context, as individuals learn and their mental models develop and adjust so too does the shared mental model. It is the change in the shared mental model, as long as any resultant action affects the organisation, that constitutes OL.

Chapter 4: Organisational Learning and the Link to Organisational Performance

The OL model is extended to include the connection with organisational performance and provides a research model to analyse the value of OL. It was noted that organisations are facing unprecedented levels of change and remaining competitive was a continual process for the majority of organisations. A key premise of strategic management is that there must be a fit between an organisation and its environment to remain competitive and survive over the long term and it was proposed that OL is crucial in maintaining this alignment. OL processes help organisations gain a broader understanding of both the external and internal environments in comparison to individual learning that is not shared, or shared but not agreed. The result of the OL

process is the creation of a shared vision on how the organisation can compete and the likelihood of coordinated action as a result of this. Adding these propositions to the OL model gave a researchable OL/organisational performance model. The chapter concluded with a cautionary note that OL does not automatically mean improved performance and notes a number of influences on the effectiveness of OL.

Chapter 5: Research Design

To measure OL it was proposed that individual and OL occurs as mental models change over time. By representing the individuals' mental models by causal cognitive mapping at two points in time, both individual and OL (by combining common components of the individuals' maps) can be charted and evaluated.

Linking OL to organisational performance draws on the fact that the proposed benefits attributed to OL emanate from OL processes facilitating organisational performance through the development of a broader understanding of the business environment and development of a shared vision which in turn provides the basis for unified action. By comparing the mental maps of top level managers with those of departmental managers the degree of how shared the vision of organisational performance improvement factors is can be assessed. Consequently, a measure of the value of OL in creating shared understandings in comparison to individual departmental manager-top manager dyads was established. The rationale being that OL will be more effective at creating similarities between the management levels because of the sharing and validating of ideas before action. Finally, after previously reviewing the learning levels literature, it was proposed that lower-level learning is likely to change mental models in a small way and higher-level learning is likely to lead to a larger change in a

mental models, therefore, a method of identifying lower and higher-level learning was established.

Chapter 6: Research Methods

The final sample for the research is outlined as consisting of four study organisations: A county council community service provider, a small manufacturing firm, an educational equipment firm, and a large transportation manufacturing and maintenance organisation. The method employed for eliciting causal cognitive maps, Laukannen's (1994) replicable elicitation technique, causal mapping 2 (CMAP2) was outlined and essentially involves constructing cause maps from interview data of managers and then analysing this using a database technique. Construct and internal validity issues are discussed in relation to the CMAP2 technique and external validity is argued to be increased by the use of a heterogeneous mix of case study organisations. In terms of reliability, the explicit, stepwise elicitation technique of CMAP2 aids the consistency, uniformity and stability of data production over the subjects. The measures used to compare the data resulting from causal mapping are then described. The basis of the analysis is the distance data (distance between subjects mental maps), which utilises a mathematical formula to produce a measure of similarity/dissimilarity between mental maps. Multi-dimensional scaling (MDS) then helps make sense of the distance results by producing graphical representations of the main characteristics of the data. Hierarchical cluster analysis was used to firstly aid the validity of the MDS results by supporting or contradicting the data groupings and secondly, to give more information into how the groupings formed and the strength of relationships between entities.

Chapters 7-10: Results, Analysis and Discussion

The results obtained from the four study organisations and presented, analysed and discussed in turn.

Chapter 11: Overall Discussion and Conclusion

The individual case study analyses are integrated to provide an overall discussion of the results and analysis. Essentially, the results support the notion of OL whilst recognising potential impediments to effective OL. The overall discussion also reveals that higher and lower-order individual and organisational learning can reasonably be identified within organisations. Based upon the conclusions managerial implications are provided that suggest organisations need to concentrate on developing shared mental models that support the strategies of the business.

Chapter 12: Contribution to Knowledge

The research questions are revisited and a summary of major and minor contributions to the field are outlined. The research concludes that there is value in the OL concept and the process should be fostered in organisation for potentially improved organisational performance. However, the barriers to effective OL must be recognised and addressed. A major contribution to knowledge of the research was to provide some empirical support for the OL concept that was argued to be lacking.

Chapter 13: Limitations and Further Research

The limitations of the study are recognised and further research directions are suggested. In particular, the study did not seek to analyse the antecedents of OL in the case study organisations, rather the aim was to research OL as it occurred, accepting

that these factors exist. The research process did however, hint at what some of these antecedents to OL might be and these provide the basis for proposals of further research.

1.4 THE EMERGENCE AND CONCEPTUALISATIONS OF ORGANISATIONAL LEARNING

The historical importance of knowledge and learning and the correlation with competitive advantage dates back hundreds of years and was embodied in activities such as passing knowledge from masters to apprentices. The relationship was more formally recognised over a century ago when the significance of knowledge as a source of economic wealth was recognised by the economist Alfred Marshall (1890) who argued that knowledge is the most powerful engine of production. These early ideas regarding the importance of learning and knowledge were focused on the individual and, although the first work on organisational learning curves appeared in the 1930s (Argote, 1999), it was not until the middle of the 20th Century that a more substantial recognition of the importance of learning at the collective level began to emerge in the literature. Prange (1999) suggested that the processes of individual and collective learning in and between organisations emerged as the concept of OL in the 1950s, with an early mention in relation to the rise and demise of public administrations. What would later be deemed as OL concepts were apparent at this time in the work of Simon (1953), Simon (1957) and March and Simon (1958). These authors recognised the influence and importance of social processes on individual decision making and hence, learning. A limited number of other studies appeared in this decade that offered propositions about how organisations learn, for example, Chapman *et. al.* (1959) utilised air defence experiments to examine how teams operated in complex and stressful situations. The results demonstrated that marked team performance differences occur as a result of

learning and this learning evidenced itself in various ways, did not appear in smooth increments, and learning was often not explicit. Subsequent to this early work, OL attracted increased, but still limited attention of researchers.

A broader theory of OL than the Chapman *et. al.* (1959) study was advanced by Cyert and March (1963) as being a part of an overall theory of economic decision making in the firm. These authors were the first to make reference to the term 'organisational learning' and it was the work of these authors that initiated wider academic and practitioner attention to OL. They viewed OL as a gradual process of adaptive behaviour that stressed well defined preferences and decision rules and placed equal weighting on the influences of success and failure. It was through this process of adaptation in internal functioning that allows the organisation to align with the external environment. Hirschman and Lindblom (1962) contributed to the early OL literature by suggesting that OL seldom occurs under conditions when goals and preferences are known *a priori*, learning is not pursued on all fronts at once, occurs in response to immediate and obvious problems, imbalances and difficulties far more than from existing plans, theories or ideologies, and is evident in discontinuous increments. Cangelosi and Dill (1965) analysed the learning processes of a seven-man team during a complex management decision exercise and proposed OL consists of interactions between adaptation at individual or subgroup level and adaptation at the organisational level. Further, they concluded that learning is sporadic and stepwise rather than continuous and gradual, and that learning goals and preferences occur concomitantly with learning how to achieve them.

It was not until the late 1970s that a more regular stream of literature on OL became apparent. Influential work by Argyris and Schon (1978) defined OL as a process by which organisational members detect errors and correct them by

restructuring organisational theory-in-use. This book was a major contribution to OL because of the unparalleled (at this time) depth it achieved represented by the range of concepts that were introduced such as the distinctions between single-loop learning, double-loop learning, and deuterio learning; the difference between espoused theory and theory-in-use; the values behind model I and II behaviour; the extension of this to models O-I and O-II; inhibitory loops; and intervention methods. These authors advocated double-loop learning which will challenge current organisational assumptions and actions and lead to new theories-in use. Soon after, Duncan and Weiss (1979) presented a study which defined OL as the process within the organisation by which organisational members develop knowledge about action-outcome relationships and the effect of the environment on these relationships.

These early studies provided fertile ground for the growth of later debates. Fiol and Lyles (1985 p.803) wrote “no theory or model of OL has widespread acceptance” and sought to help clarify the contest between OL and organisational adaptation and suggested that change does not necessarily imply learning. They defined OL as a process of improving actions through better knowledge and understanding. Levitt and March (1988 p.319) reviewed the literature on OL at the time and proposed that OL “is viewed as routine based, history dependent, and target oriented. Organisations are seen as learning by encoding inferences from history into routines that guide behaviour”. Huber (1991), one of the few to focus on the organisation as the primary learning entity rather than individuals, examined four constructs relating to OL (knowledge acquisition, information distribution, information interpretation, and organisational memory) and wrote that an organisation learns if any of its units acquires knowledge that it recognises as potentially useful to the organisation. For Huber (1991), OL is a matter of information processing and hence, information processing limitations inhibits OL

effectiveness. Importantly, Huber (1991) recognised that OL was not necessarily always desirable as organisations, like people, can learn the right things incorrectly or they can learn the wrong things correctly. Rather than viewing OL as information processing, Weick and Roberts (1993) drew on social psychology literature and understand OL as concerned with how individual learning is constrained or enabled by the environment as well as individual cognitive abilities. For these authors, OL consisted of heedful interrelations of actions in a social system and as heedful interrelating and mindful comprehension increase organisational errors will decrease.

A review by Prange (1999) provides an overview of the processes of OL from some of the most well regarded early authors:

The Processes of OL

<i>Author(s) / Year</i>	<i>Processes of OL</i>
Cyert and March (1963)	Adaptation of goal, attention and search rules; learning from experience
Cangelosi and Dill (1965)	Adaptation to conflicting patterns of behaviour caused by stress
Argyris and Schon (1978)	Assumption sharing; individual and collective inquiry constructs and modifies theories in use; exact process remains unclear
Duncan and Weiss (1979)	Development of action-outcome relations via: sharing, evaluation, integration
Fiol and Lyles (1985)	Low-level learning as repetition of past behaviour, high level learning as development of complex associations
Levitt and March (1988)	Learning from direct experience; learning from the experience of others; learning of paradigms for interpretation
Huber (1991)	Information processing: acquisition, distribution, interpretation and storage of information; the related processes of OL remain unspecified
Weick and Roberts (1993)	Heedful interrelating via: contribution, representation, subordination

Table 1.1: The Processes of OL (Source: Prange, 1999)

In the early 1990s, perspectives were emerging in which OL occurred from social interactions as opposed to the predominant view that OL occurs via individual inner mental processes. Elkjaer (2003) explains that this situated view of learning moved learning away from the individual mind to the social realm of interaction, activity, and practice. Elkjaer (2003) proposed that the early roots of this perspective emanate from American pragmatism, and in the work of the early 20th century Russian psychologist Vygotsky and the tradition of the cultural-historical activity theory (Bredo, 1997; Elkjaer, 2000; Popkewitz, 1998). Lave and Wenger (1991) were early proponents of this view who developed the idea of communities of practice in a study of situated learning. Lave and Wenger (1991 p.98) defined a community of practice as “a system of relationships between people, activities, and the world; developing with time, and in relation to other tangential and overlapping communities of practice”. It is the community of practice that holds, transfers, and creates knowledge and hence, facilitates OL.

Brown and Duguid (1991 p.40) also concentrated on the communities of practice concept. They argued that “education, training, and technology design generally focus on abstract representations to the detriment, if not exclusion of actual practice. We, by contrast, suggest that practice is central to understanding work”. The authors contend that to foster working, learning, and innovating an organisation needs to reconceive itself as a community-of-communities, where learning occurs as members acquire skills necessary to behave as members of these communities. Whilst Lave and Wengers (1991) approach to the social learning view of OL was learning as a cultural process, Brown and Duguid (1991) viewed social learning from a social constructivist perspective involving the construction of a common understanding derived from a social setting, physical circumstances and from peoples social relationships and

backgrounds. Stemming from these seminal works the communities of practice approach has received attention from a number of later researchers (*e.g.* Cook and Yannow, 1993; Gherardi *et. al.*, 1998).

Although from a differing perspective, Nonaka and Takeuchi (1995) also emphasised the social nature of OL and while they insist that knowledge creation and OL are different concepts (Vera and Crossan, 2003), the similarities cannot be overlooked. Nonaka and Takeuchi (1995) view the knowledge creation process as a spiral. Tacit knowledge is turned into explicit knowledge, first by individuals, then by groups and finally by the organisation. Socialisation, internalisation, externalisation, and combination all occur in a type of dynamic interaction. When viewed as a continuous learning process, the model becomes a clockwise spiral and OL depends on initiating and sustaining the learning spiral (The model is a spiral, not a cycle, because as one learns around the cycle, understanding moves to deeper and deeper levels). Within a company, there are five enablers for knowledge creation; vision, strategy, structure, system, staff. Nonaka (1991) cites an example of an employee of the Matsushita company that wanted to make an improved bread making machine. Firstly, she observed a master baker making bread and through observation, practice and trial and error learnt these tacit skills. Then she made this tacit knowledge explicit by noting down a set of instructions that could be used by the project development team (externalisation). The team then standardises the knowledge into a manual (communication). Then finally, through this experience of making a new product, the team has enriched its own tacit knowledge (internalisation). This knowledge is then shared with other Matsushita employees and the whole company's tacit knowledge is improved and then the process begins again, a spiral of knowledge

Peter Senge (1990), already an influential management theorist, wrote “The Fifth Discipline” and drew increased academic and practitioner focus towards the concept of the Learning Organisation and the associated idea of OL. Grounded in systems thinking the core disciplines of creating the learning organisation were propounded as being personal mastery, mental models, building a shared vision, and team learning. This ‘ideal entity’ is described by Senge (1990 p.3) as “organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together”. A year later Pedler *et. al.* (1991 p.1) also focussed on the learning organisation concept and propounded the ‘Learning Company’ as “an organization that facilitates the learning of all its members and continuously transforms itself”. Drawing on other writers in the field, particularly Revans (1982), Argyris and Schon (1978) and the authors own research and experience a list of common characteristics were identified that constituted the learning company. This prescriptive work then outlines how these eleven characteristics (a learning approach to strategy, participative policy making, informing, formative accounting and control, internal exchange, reward flexibility, enabling structures, boundary workers as environmental scanners, inter-company learning, a learning climate, self-development opportunities for all) can be fostered within companies.

Senge’s (1990) influence was evident in the proposals of Kim (1993a) who utilised a cognitive perspective to explicate OL and developed a model that outlined the link between individual and organisational learning. For Kim (1993a), OL begins with the individual through experiential learning and is transferred to the organisation through mental models. These mental models are defined as “the thought constructs that

affect how people and organizations operate in the world” (p.37). The principle surrounding these ideas is that as mental models are made explicit and actively shared, the base of shared meaning in an organisation expands, and the organisation’s capacity for effective coordinated action increases (p.48). Similar concepts were apparent in the work of Dixon (1994) who developed Kolb’s (1984) model of experiential learning into a model of the OL cycle which consists of: widespread generation of information, integration into organisational context, collectively interpreted new information, authorisation of organisational members to take responsible action. The model of Dixon (1994) involved a two-stage process of individuals articulating their mental models to others and then being receptive to the mental models represented by others. Like Kim (1993a), individual learning promotes OL to the extent that knowledge is made explicit and shared collaboratively with others (Shipton, 2006).

OL is described by Stata (1996) as being the principal process by which management innovation occurs. Influenced by Jay Forrester and Peter Senge, and driven by systems thinking, Stata (1996) portrayed OL as a collage of individual learning processes that manifests itself in shared insights, knowledge, and mental models that builds on previously acquired knowledge and experiences, which are then stored in the organisation’s memory. For Cummings and Worley (1997 p.492), OL consisted of four interrelated processes: discovery, invention, production and generalisation. In their view the process should consist of three phases: 1. discovering theories in use and their consequences; 2. inventing and producing more effective theories in use and; 3. continually monitoring and improving the learning process. These authors refer to OL as “a process aimed at helping organisations to develop and to use knowledge to change and improve themselves continuously”.

Crossan *et al.* (1999) display elements of Cangelosi and Dill's (1965) foundational work by arguing in their 4I framework of OL that learning takes place at the individual, group, and organisational levels and that four sub-processes link the three levels (intuiting, interpreting, integrating, institutionalising), involving both behavioural and cognitive changes. According to this model, the process of OL can be conceived as a dynamic interplay among the organisation belief system, the behaviours of its members, and stimuli from the environment, where beliefs and behaviours are both an input and a product of the process as they undergo change. This model holds that through 'feed-forward' individuals and groups question existing ways of thinking and operating and present their own ideas, whilst through 'feedback' insights acquired are implemented across the organisation.

In the vein of Kim (1993) and Dixon (1994), Spicer (2001) also focused on the mental models concept and developed a model of OL that begins with individual experiential learning which is then transferred to become OL by way of the development of shared mental models. An individuals' cognitive style was identified as a crucial intermediary and the model also integrates Senge's (1990) notions of adaptive and generative learning. The implications were, amongst others, that organisations need to concern themselves with building shared understandings which add value to the business, promote generative learning, and ensure that key understanding is transferred organisation wide and is available when and where required. Sadler-Smith *et al.* (2001 p.140) viewed OL as the development or acquisition of new knowledge or skills in response to internal or external stimuli that leads to a more or less permanent change in collective behaviour, enhancing organisational effectiveness. Hodgkinson (2000) identified OL as the coming together of individuals to enable them to support and encourage one another's learning which will in the longer term be of benefit to the

organisation. Sun and Scott (2003) also take an individual level focus, yet promote an all-encompassing view of OL as the learning process used in the organisation which deals with the question of how individuals in the organisation learn.

Ortenblad (2004) explains OL as being one of four aspects of the learning organisation and claims that individuals learn as agents for the organisation. What each individual learns is stored in the memory of the organisation i.e. outside single individuals which Ortenblad claims makes the learning and knowledge organisational. The organisational memory consists of routines, standard operating procedures, shared mental models, documents, manuals etc. and it is the organisations memory that regulates the organisation's behaviour and that of its members as well as directs attention to what they should learn. Earlier work by Ortenblad (2002) gives insights into how OL can be promoted in organisations. In noting that neither of the dominant paradigms that have characterised OL theory to date (functionalist and interpretive) are truly 'radical' in the sense of challenging conditions of power and control in organisations, a radical perspective was proposed based on themes in the critical OL works. The radical perspective of OL implies an organisation where the individuals learn as free actors and there are norms or rules to guarantee freedom. The learning space in the organisation guarantees the occurrence of different opinions and allows everyone to reflect upon their actions and learning. Working time and employee commitment are restricted so that work does not interfere too much with other undertakings. All employees are guaranteed permanent appointments, and organisations die to make a place for others when their missions are accomplished.

Gnyawali and Stewart (2003 p.83) drew on cognitive literature to formulate a contingency model of OL that combines interactive and informational OL processes to result in four types of learning (reinventive, formative, adjustive, and operative). They

argue that the contingency based OL framework “suggests that environmental conditions are noticed and understood through the OL processes, and the use of an appropriate process in a specific environmental context helps organizations to enhance their understanding of the environment”. Forman (2004) proposed an OL framework consisting of two levels. The first is the contribution level (the main organisational capabilities at this level are to learn, collaborate, leverage, and innovate) which refers to what individuals, teams, and groups do to develop new knowledge, processes, approaches, and products. The second level is termed the multiplier level, which expands and magnifies contributions throughout the organisation to more people, faster and more effectively and includes the organisational capabilities of mentor, network, and inspire. Forman (2004 p.19) claims that it is this level that can lead to a sustaining and vibrant learning culture and adds “The contribution and multiplier levels work together to foster organizational learning. If the organizational capabilities in the contribution level exist and work together seamlessly, then the collective level of organizational learning rises. If the capabilities in the multiplier level are present, integrated, and effective, then organizational learning’s influence is extended and a learning culture begins to take hold”.

Elkjaer (2004 p.419) developed a ‘third way’ of OL that combined elements of the two predominant existing ‘ways’. The ‘first way’ of OL is identified as “individuals’ skills and knowledge acquisition in organizations as systems”. Whilst the ‘second way’ of OL involves “learning as participation in communities of practice”. Synthesising these perspectives enabled the development of the ‘third way’ of OL that “is defined as the development of experience and knowledge by inquiry (or reflective thinking) in social worlds held together by commitment”. A practical implication of this view was to bring intuition and emotion to the forefront of OL and development. A sociological

model of OL based on Parsons' (1951) general theory of action is proposed by Casey (2005) who defines OL as a system of actions, actors, symbols and processes that enables an organisation to transform information into valued knowledge, which in turn increases its long run adaptive capacity. Prerequisites for the OL system are performed by four learning subsystems: 1. the environmental interface (adaptation), which brings information into the system; 2. the action-reflection subsystem (goal attainment), which consists of the activities used to accomplish goals of the learning system; 3. the dissemination-diffusion subsystem (integration), which matches information and knowledge transfer actions with the requirements of other subsystems, including integrative actions such as networking; and 4. the meaning-memory subsystem (pattern maintenance) that provides the collective meaning and memory. Casey (2005) suggested that the effectiveness of the whole system may be compromised by the dysfunction in any one of the interdependent learning subsystems. Orthner *et. al.* (2006) define OL as an information management strategy that consists of systematic efforts to transfer knowledge throughout an entire organisation. Drawing on Senge's (1990) ideas important components of their model of OL are leadership engagement, tolerance for errors, vision sharing, asking learning questions, use of tacit knowledge, time for reflective learning, value placed on new ideas, and results-oriented processes. Lick (2006) argued that OL is the result of collaborative work systems such as learning teams and professional learning communities. Lick explained that collaborative work systems are those in which a conscious effort has been made to create strategies, policies and structures and institutionalise values, behaviours and practices that enable individuals and groups to effectively work together to achieve desired results and organisational goals. Lopez *et. al.* (2006) draw on previous literature to define OL as a dynamic process of creation, acquisition and integration of knowledge aimed at developing the

resources and capabilities that allow the organisation to achieve a better performance. Recognising the diversity of perspectives in the OL field as constituting a challenge to developing a comprehensive model of OL, Hong *et. al.* (2006) proposed a holistic view of OL. These authors identified and incorporated three broad streams of OL research, knowledge-oriented, routine oriented and socio-contextual oriented perspectives as elements within an overall systems model of organisational learning.

What is evident from this section is that the field of OL is far from coherent. Easterby-Smith (1997) recognised six academic perspectives which have made significant contributions to understanding OL as being psychology and organisation development, management science, strategy, production management, sociology, and cultural anthropology. Spender (1998) notes that philosophers, cognitive scientists, computer scientists, social psychologists and anthropologists have all made important contributions to our understanding of OL. Furthermore, as a universally accepted definition of OL is not yet apparent, the term has been adjusted to various units of analysis from the individual (*e.g.* Argyris and Schon, 1978; Senge, 1990; Nonaka, 1991; Simon, 1991; Kim, 1993a; Spicer, 2001; Hodgkinson, 2000; Sun and Scott, 2003; Ortenblad, 2004; Spector and Davidsen, 2006), to groups within the organisation (*e.g.* Duncan and Weiss, 1979; Fiol and Lyles, 1985; Brown and Duguid, 1991; Lave and Wenger, 1991; Elkjaer, 2004), and the organisation as a whole (*e.g.* Levitt and March, 1988; Huber, 1991). Bertoin-Antal *et. al.* (2001 p.921) note that the “very definition of organizational learning is subject to controversy and flux” and Crossan *et. al.* (1999) claim that although the term organisational learning has existed for at least 30 years there is still little convergence or consensus on what is meant by the term. OL has been applied to diverse organisational processes, for example, from information distribution and interpretation (*e.g.* Huber, 1991), to the encoding of organisational routines (*e.g.*

Cyert and March, 1963; Levitt and March, 1988), and from the processes involved in individual interpretation and creation of organisations (e.g. Weick, 1979; Daft and Weick, 1984), to the role of interpersonal communication as a precursor for error detection and correction (Argyris and Schon, 1974), to social interactions as the process of OL (Brown and Duguid, 1991). Friedman *et. al.* (2005 p.20) contested that these issues continue to prevail and identified three main features of the field as being firstly, the lack of a clearly agreed definition, secondly, a persistent problem of conceptual divergence and thirdly, the difficulty in translating the concept into a researchable construct. These authors state that "...the more organizational learning is studied, the more obscure it seems to become".

1.5 ORGANISATIONAL LEARNING AND ORGANISATIONAL PERFORMANCE RESEARCH

As a result of the ambiguity surrounding the OL concept, the relationship between OL and organisational performance is by no means clear nor is it agreed whether OL is even desirable. Whilst the more prescriptive literature (e.g. Senge, 1990; Crossan *et. al.*, 1999) advocates OL as being crucial to organisational performance, the more descriptive literature (e.g. Huber, 1991; Brown & Duguid, 1991) warns of the dysfunctional outcomes that can occur as a result of OL. Even among the majority of advocates who deem OL to be desirable and positively contributing to organisational performance, it is recognised that the relationship between OL and organisational performance has been inadequately dealt with and problematic (Zairi, 1999; Goh and Richards, 1997). This is because learning is difficult to measure or to link directly to traditional performance indicators. There are various levels and perspectives associated with organisational performance both formal and informal, financial and non-financial.

It has also been noted that improvements in performance are unlikely to be instantaneous and so it is difficult to relate it to specific learning initiatives.

These difficulties are apparent in previous studies that underline the positive effects that OL has on business performance. Lopez *et. al.* (2005 p.231) wrote “The prescriptive literature considers financial results as business performance (Lei *et. al.*, 1999). Although these outcomes are important, there may be more proximate outcomes that may mediate the relationship with financial results. For example, outcomes of organizational learning behaviours may include changes in values and assumptions (Argyris and Schon, 1978), skills (Fiol and Lyles, 1985), systems and structures (Levitt and March, 1988), core competencies (Prahalad and Hamel, 1990), organisational innovativeness and competitiveness (Nason, 1994), corporate success and employee satisfaction (Bontis *et. al.*, 2002)”. Further, learning does not always immediately affect economic and financial results and certain external factors, such as changes in government regulations or in production or distribution costs, may favour one company over another (Crossan *et. al.*, 1995). This does not mean research of this type has not been attempted and there are a number of efforts that have focused on performance related outcomes of OL.

An empirical study by Prieto and Revilla (2006) explored the link between learning capability in organisations and business performance evaluated in both financial and non-financial terms. By conducting structural equation modelling using data from 111 Spanish companies the analysis concluded that there was a positive link existing between learning capability and non-financial performance, and non-financial performance and financial performance. Similarly, an empirical study utilising structural equation modelling was conducted by Dimovski and Skerlavaj (2005) researching the influence of OL on financial and non-financial performance. After

analysing a sample of 867 Slovenian companies it was concluded that the impact of OL on financial performance is strong and the influence of OL on non-financial performance is even stronger. A similar study by Lopez *et. al.* (2005) studied the relationship between OL and business performance of 195 Spanish firms, again using structural equation modelling. The findings, the authors claim, provide support for the view that OL contributes positively both to innovation and competitiveness and to economic/financial results. Aragon-Correa *et. al.* (2007) used structural equation modelling and data from 408 large firms and concluded that OL had a strong direct influence on innovation and in turn, innovation positively and significantly influenced organisational performance. The impact of an organisational learning culture on organisational performance is empirically tested via structural equation modelling by Skerlavaj *et. al.* (2007) using 203 Slovenian companies. These authors found that an organisational learning culture has a positive direct impact on non-financial performance and an indirect positive effect on financial performance.

Spicer and Sadler-Smith (2006) investigated OL in smaller manufacturing firms and demonstrated a link between OL orientation and performance (both financial and non-financial), although they were cautious about inferring causality in the relationships. Jensen and Rasmussen (2004) employed a psychological approach to relating OL to outcomes and assert, after studying three teams managing a complex environment, that the quality of thinking and acting correlates positively with the quality of performance. Bontis *et. al.* (2002) studied the relationship between the stocks and flows of learning across levels in an organization using a survey instrument based on Crossan and Hlland's (1997) Strategic Learning Assessment Map. The analysis of a sample of 480 respondents from 32 organisations concluded that there was a positive relationship between the stocks of learning at all levels and business performance. Furthermore, it

was proposed that the misalignment of stocks and flows in an overall organisational learning system was negatively associated with business performance.

Shipton *et. al.* (2005) focused on the relationship between OL and innovation and demonstrated that manufacturing organisations which have in place mechanisms designed to promote learning, such as employee mentoring schemes and regular attachments to other parts of the business, are more innovative than those less committed to implementing these practices.

The observation that unit costs tend to decline at a uniform rate with experience lead to the 'OL curve' phenomenon and has been the focus of a number of research projects. Essentially, learning curve research has investigated firm productivity and the extent to which manufacturing plants vary in their learning where new work processes are introduced. Arthur and Huntley (2005) examined how suggestion-based employee knowledge generated through a gain-sharing productivity improvement program affected organisational performance. Using four years of monthly data from one organisation the conclusions were that the cumulative number of implemented employee suggestions significantly contributed to lower production costs. The results of a study by Argote *et. al.* (2000) found that a second shift added at a manufacturing plant achieved a level of productivity in two weeks that had taken the first shift months to achieve. The proposition was that knowledge had become embedded in the structures and technology of the plant, as well as the thinking processes of those managing the start-up. Earlier, Argote and Epple (1990, p. 924) demonstrated that "there is great variation in the rate at which organizations learn, ranging from production programmes with little or no learning to those with impressive productivity growth", concluding that organisations will transfer knowledge more effectively where transfer is timely, where

turnover rates are relatively low and where the transfer process is well managed and documented (Shipton, 2006).

Tannenbaum (1997) focused on the influence of the organisational work environment on continuous learning which the author claimed was a prerequisite for OL. Based upon a literature review and interviews in multiple organisations a questionnaire was developed and administered to over 500 participants from seven organisations, supplemented by structured interviews. The results revealed that organisations with strong learning environments appeared to demonstrate greater organisational effectiveness. However, the author does recognise that the results are “somewhat speculative” (p.447). Recognising that the majority of OL theory is based upon large firms, Chaston *et. al.* (1999) shifted the focus to attempt to understand OL in the small and medium enterprise sector. These authors examined the relationships between OL, organisational capability and performance (in terms of sales growth over the last three years) in small and medium enterprises. In contrast to the normative view of OL that proposes engaging in OL increases organisational performance, the conclusion was that “...there appears to be no direct relationship between overall organisational performance and OL” (p.196). A later empirical study by these authors within small U.K. manufacturing firms was more optimistic regarding OL in concluding that “It would appear that the results provide empirical support for the concept that involvement in higher-order OL can contribute to improving information management capabilities within small firms” (Chaston *et. al.*, 2001 p.149).

Whilst these studies predominantly indicate that OL positively affects organisational performance, there are concerns that mean this conclusion is far from conclusive. For example, varying meanings of what constitutes OL and organisational performance are evident, arguably overly simplistic methodologies are utilised to

capture a complex phenomenon (learning), and the potential influence of mediating variables are often overlooked. These studies are primarily based within a behavioural perspective, however, behaviourism has been criticised for lacking conceptual depth as behaviour change may not be an indication of learning, and any number of other factors may interfere with the expression and manifestation of learned behaviours (Yeo, 2002). Fundamentally, as Ford and Kraiger (1995) suggest, a stimulus-response orientation does not capture the complexity of the learning process. Further, organisational performance is invariably treated as the dependent variable, yet debate surrounds whether performance may in fact act as an antecedent to organisational outcomes such as organisational mortality, job satisfaction or the effective management of an OL system. Mintzberg *et al.* (1995) argued that learning and performance may in fact be tied together in a continuous loop and argued that performance provides important feedback about the efficiency of a learning process and ultimately affects how an organisation continues to learn (Bontis *et al.* 2002).

1.6 FROM FRAGMENTATION TO INTEGRATION

Given the lineage of OL it is paradoxical to note that the concept is still viewed as a new phenomenon. The previous sections highlight why this perception remains - very different definitions are given by contributors for the concept of OL, researchers choose diverging aspects of the phenomenon as the focus for their activities, various perspectives are employed and research methods are utilised, and no conclusive evidence exists that links OL to improved organisational performance. As a result, the area remains fragmented and consensus in the field is all too rare. While this may be deemed appropriate for an emerging area of study, it is not as suitable in a well established research area that has been close to the core of the field of organisation

studies for a significant amount of time. Therefore, this lack of a united front hinders the field flourishing into a coherent, accepted discipline that can move to the centre stage of organisation theory based on its own merits.

An example of the difficulties of integration is the lack of agreement on even a fundamental issue such as whether a unified theory of OL is needed. Although most would agree that this would contribute to a more in-depth understanding of the construct (e.g. Huber, 1991; Tsang, 1997; Edmondson and Moingeon, 1998), Easterby-Smith (1997) would disagree. An extensive review by this author concluded that the development of such a theory was both unrealistic and may in fact be counterproductive in an area of research which encompasses views from a number of distinct research disciplines, each offering unique and valuable insights into various aspects of the phenomenon of OL. Edmondson and Moingeon (1998) agree that there are some benefits to be gained from a limited amount of fragmentation in the field. However, they assert that the existing level of fragmentation of OL research is problematic, in that it not only limits the potential usefulness of different contributions, but also confuses practitioners.

Using Weick's (1979) GAS method of assessing tradeoffs between *generality*, *accuracy* and *simplicity* of theories, empirical model testing forces researchers to place more weight on the accuracy of the models they use, rather than trading such accuracy for simplicity (parsimony) and generality (broad appeal). This may result in fewer grand theories of OL that promise much but are unable to deliver, and more middle range theories that are better able to provide value to researchers and managers alike. A second important benefit of such a concerted effort to empirically test theories and models, related to the low degree of theory explication discussed above, is that the process of operationalising theories and models would provide clear operational

definitions of the theorised elements and relationships. Ideally, beyond providing such operational definitions, this would force researchers to explicate their models and theories further (Gallagher, 2000).

In general, the level of paradigm development (Lohdahl and Gordon, 1972), or the degree to which a field of study is characterised by technical certainty and consensus, reflects some of the conditions enabling scientific progress (Pfeffer, 1993). It is contested that the existing level of fragmentation in the field of OL is hindering this development. It is proposed that a method of advancing OL research is the utilisation of systematic empirical investigation with carefully considered methodologies to test, refine or reject proposed models.

1.7 SUMMARY

This chapter provided an overview of the emergence and conceptualisations of OL and revealed that the concept has a pedigree dating back at least 50 years, yet remains diverse and fragmented. The limited existing empirical attempts that study the relationship between OL and organisational performance utilise varying, and in some cases simplistic, conceptualisations of OL and organisational performance which has resulted in a far from established unequivocal link between OL and organisational performance.

An accepted method of how scientific fields have traditionally overcome such fragmentation is through systematic empirical investigation of the various models and careful testing of theories and hypotheses to either provide support for, or evidence contrary to, those theories purported by the creators of the models. Empirical research has the ability to provide a foundation for integration and cohesion and hence, advancement of this important research area.

The following chapter seeks to provide a foundation for empirical research. Firstly, OL is distinguished from the learning organisation, organisational knowledge and knowledge management concepts. Secondly, the dominant perspectives which have been utilised to research OL are critically reviewed to identify an appropriate perspective to meet the aims of the current study.

CHAPTER 2

2. Development of a Research Foundation

2.1 INTRODUCTION

The purpose of the chapter is to provide a foundation on which to research the process and value of OL. The OL concept is presented as being distinct by differentiated OL from the learning organisation, knowledge management and organisational knowledge concepts. The dominant perspectives which have been utilised to research OL are then critically reviewed to identify an appropriate perspective to meet the aims of the study.

2.2 POSITIONING ORGANISATIONAL LEARNING

Organisational learning is related to the associated disciplines of the learning organisation, knowledge management, and organisational knowledge with the differences between the concepts often seeming vague. For example, Ortenblad (2001 p.125) writes “Almost everyone once used the terms organizational learning and learning organization interchangeably, if not as synonymous (e.g. Boje, 1994 p.433-34; Hawkins, 1994; Hedberg, 1981, p.22; Levitt and March, 1988, p.323; Nevis *et. al.*, 1995)”. The present research defines OL as a distinct concept and so it is important to differentiate OL in relation to these other concepts. Easterby-Smith and Lyles (2003) provide a simple map of these topics that is useful to help distinguish the terms. However, the authors themselves agree that this was not a rigorous conceptualisation.

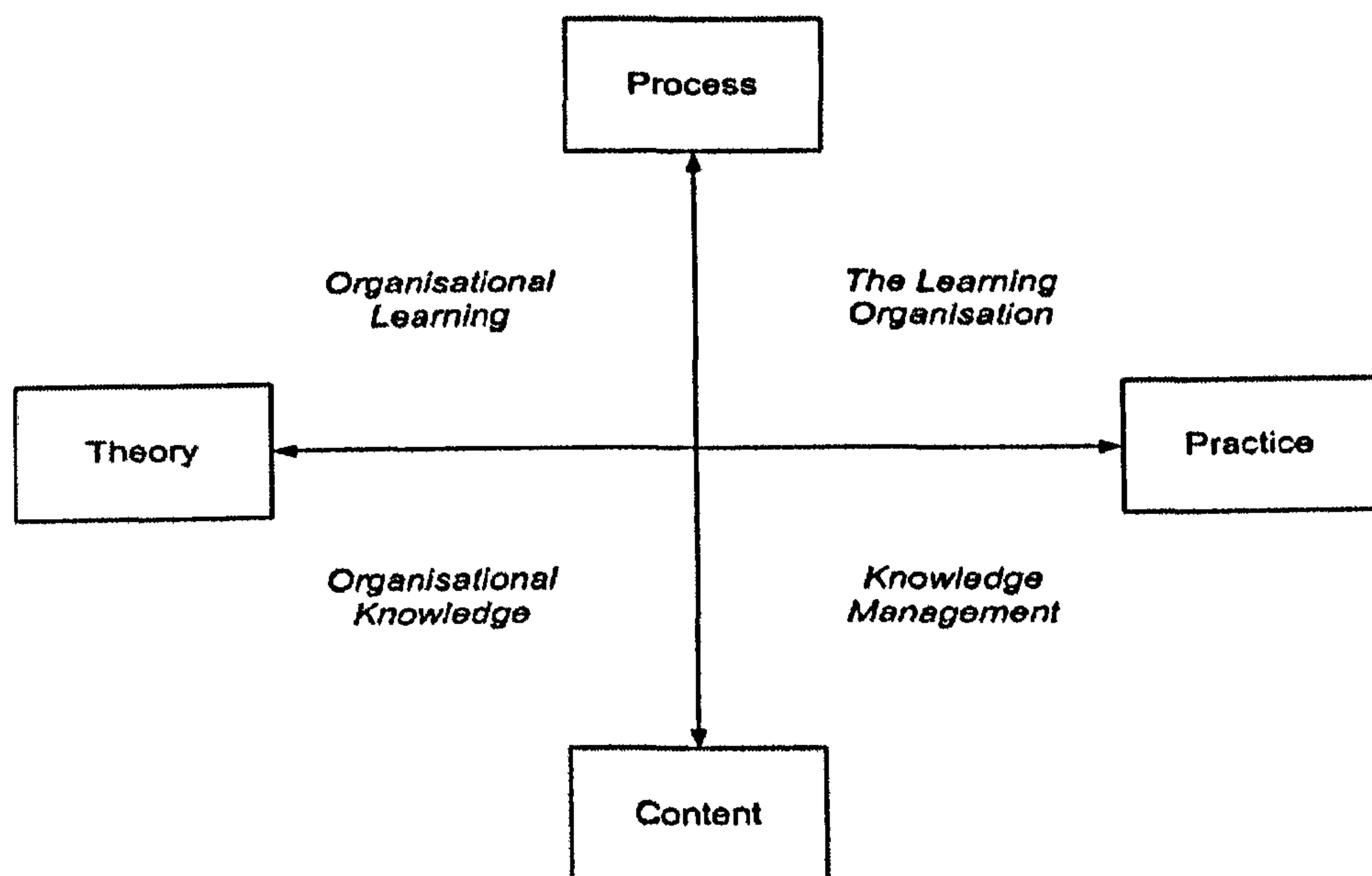


Figure 2.1: Mapping Organizational Learning and Knowledge (Source: Easterby-Smith and Lyles, 2003)

According to this map, OL refers to the study of the learning processes of and within organisations from an academic point of view (Tsang, 1997). In contrast, the learning organisation is an ideal type of organisation, which has the capacity to learn effectively and prosper. Those who write about learning organisations generally aim to understand how to create and improve this learning capacity, and therefore have a more practical and performative agenda. Similarly, organisational knowledge involves trying to understand and conceptualise the nature of knowledge that is contained within organisations, whilst creating ways of disseminating and leveraging knowledge in order to enhance organisational performance is the domain of knowledge management. Information technology is often at the heart of knowledge management, although social aspects are gaining increased recognition (Garvey and Williamson, 2002). Argyris (1999 p.1) made similar observations on the relationship between OL and the learning organisation:

We divide the literature that pays serious attention to organizational learning into two main categories: the practice-oriented, prescriptive literature of 'the Development of a Research Foundation

learning organisation', promulgated mainly by consultants and practitioners, and the predominantly sceptical scholarly literature of 'organizational learning', produced by academics. The two literatures have different thrusts, appeal to different audiences, and employ different forms of language. Nevertheless, they intersect at key points: their conceptions of what makes organizational learning 'desirable', or 'productive'; their views of the nature of the threats to productive organizational learning; and their attitudes towards whether - and if so how - such threats may be overcome.

Vera and Crossan (2003) note that OL deals with the question of how does an organisation learn? Whilst the learning organisation is targeted at practitioners who are interested in the question, how should an organisation learn? A further and important distinction in the context of this research between definitions relating to OL and the learning organisation is that the latter has a tendency for definitions to incorporate actual behavioural change in order to cater for their target audience, which is largely action-oriented. Definitions of OL are not necessarily couched as such.

2.3 DOMINANT RESEARCH PERSPECTIVES IN ORGANISATIONAL LEARNING

The disparate range of perspectives utilised to address the OL phenomenon is apparent from the preceding chapter. It is important to analyse the most widely used research perspectives as they invariably differ with respect to their philosophical origins, assumptions, concepts, and ability to answer the research questions of this study. The following section examines three research perspectives that dominate OL research - cognitivism, social learning, and behaviourism, and argues that the cognitive perspective should be employed as the central methodological framework for the present research.

2.3.1 Cognitivism

The majority of authors define 'real' OL in terms of cognitive change (Leroy and Ramanantsoa, 1997). DeFillippi and Ornstein (2003) studied psychological perspectives (biological, behavioural, cognitive, socio-cultural, and psychodynamic) underlying theories of OL and whilst recognition of the various psychological perspectives is deemed to be important, these authors concluded that cognitive learning perspectives dominate most OL theories. They summarise that the cognitive approach seeks to explain people by understanding their thinking, reasoning, and memory i.e. their cognitions. Chiva and Alegre (2005 p.52) review the cognitive perspective of OL and identify two approaches. The first approach includes proponents such as Cyert and March (1963), Hedberg (1981), Daft and Weick (1984), Levitt and March (1988) and focuses on "individual learning as a model for organizational action, or what amounts to the same, on learning in organizations based on human learning processes". The second approach understands OL as individual learning in an organisational context of which Dodgson (1993), March and Olsen (1975), Shrivastava (1983) and Simon (1991) are examples. This approach considers OL to be a type of individual learning carried out in organisations by key individuals whose learning is linked to organisational action.

In the wider realm of organisational analysis, Hodgkinson and Sparrow (2002 p.9) note the emergence of the management and organisational cognition perspective:

Drawing on theory and research from a variety of interrelated fields, especially cognitive and organisational psychology, social cognition and organisational sociology, a new approach to organisational analysis has developed over the past 15-20 years or so: the managerial and organisational cognition perspective (e.g. Porac and Thomas, 1989; Meindl et. al. 1994, 1996; Hodgkinson and Thomas, 1997; Spender and Eden, 1998; Lant and Shapira, 2001). Faced with a complex, ambiguous and continually changing environment, organisational actors have to absorb, process, make sense of and then disseminate a bewildering flow of information in order to make decisions and solve problems. Managerial and organizational cognition research is concerned with the analysis of these processes.

Walsh (1995) writes that managers (and indeed all individuals) meet this information challenge by employing knowledge structures to represent their information worlds and thus, facilitate information processing and decision making. Therefore, often central to the cognitive perspective of learning is schema theory (or knowledge structure theory). This construct emerged from clinical neurology via significant works of Bartlett (1932), Woodworth (1938), and Oldfield and Zangwill (1942). However, it was not until the late 1960s that researchers really became interested in the cognitions that might mediate stimulus-response relationships (Neisser, 1967; Walsh, 1995). Gnyawali and Stewart (2003) define the cognitive structures that mediate the stimulus-response relationship as schemas which are a stored framework consisting of a set of concepts, relationships among the concepts, and information embedded in them. Learning occurs when these schemas are transformed, created, refined, or validated (Rumelhart and Norman, 1978; Vosniadou and Brewer, 1987) and OL can be viewed as processes through which organisational cognitive structures are created and changed (Nicolini and Mezner, 1995).

Cognitive perspectives have been widely used to describe OL (*e.g.* Duncan and Weiss, 1979; Fiol and Lyles, 1985; Garvin, 1993; Argyris, 1996; Kim 1993b; Spicer, 2001; Gynawali and Stewart, 2003) and the essence of this perspective for organisational research is that organisations learn through individuals, but also through creating shared knowledge structures that allow them to take purposeful actions. However, Cook and Yannow (1993) noted potential problems with the cognitive perspective and in particular, when concepts inherent to individuals are transferred to organisations. The problem of anthropomorphism, in the sense that whether, like individuals, organisations are capable of learning is a recurrent debate in OL literature. It is also argued that because of the complexity of individual learning, this will create

problems at the organisational level. Finally, the authors question the claim that the OL process is similar to that of the individual as not having been justified. In fact, Cook and Yannow (1993), based on the proposition that individuals and organisations are so different, question any potential transference of individual concepts to organisations.

2.3.2 *Social Learning*

At the end of the 1990s, Gherardi *et. al.* (1998) noted that learning was still mainly conceived in individual cognitive terms, but noted a large body of work was accumulating on the social dimensions of learning and particularly of a social constructivist perspective. Whilst the cognitivist perspective has been outlined as the process by which organisations create mental representations of an external reality, with organisational knowledge constituting an organisation's representation of this reality, those adhering to a more constructivist approach to OL tend to focus on social interaction as a means whereby people construct their reality. As such, organisations facilitate interactions between individuals as they participate in activities, and it is these interactions and activities that support and continuously 're-create' the organisation.

For social constructivists OL is not something that takes place in the heads of individuals, but is accomplished through interaction (Easterby-Smith and Araujo, 1999). Social learning theory in the OL literature has been coined under several names such as 'situated learning' (Brown and Duguid, 1991; Richter, 1998), as 'practice-based learning' (Gherardi, 2000), 'communities of practice' (Lave and Wenger, 1991) and 'learning as a cultural process' (Cook and Yannow, 1993; Henriksson, 2000; Yannow, 2000). The term social learning theory appears as the domain falls within the field of social theory, and that the point of departure for learning is the living experience of everyday life. Applying a social learning theory in OL takes the focus of learning away

from the individual mind and places it in the organisational context as a setting for OL. This means that organisational actions directed to develop OL cannot be solely focussed on changing individuals' ways of thinking but should be focused on the organisational context, its patterns of participation and interaction. Social learning theory also takes the focus away from knowledge as the learning input to that of developing organisational members so that they become capable practitioners. Learning is viewed as an ongoing activity, which cannot be controlled, only the environments and the organisation can be made to facilitate OL to a larger or lesser degree (Elkjaer, 2003). Social learning theorists take an interpretive paradigm, where the reality is no longer objective (Ortenblad, 2002). Instead, reality is seen as a subjective phenomenon and hence knowledge cannot easily be unequivocally described. Ortenblad (2002 pp.90-91) provided a succinct encapsulation of this view:

Knowledge is context dependent; learning is situated (Lave and Wenger, 1991). In fact, all learning is contextualised (Lave, 1993; Lave and Wenger, 1991). The learning entities are not individuals as cognitive individuals (Gherardi and Nicolini, 2000). Instead, learning is a social practice. The learning starts in relationships, not in individuals as in the functionalist paradigm (Oswick et. al., 2000). Learning takes place in relations between individuals or between the individual and her/his work task. The community of practice learns (Brown and Duguid, 1991; Lave and Wenger, 1991; Richter, 1998; Wenger, 1991). Furthermore, learning is not confined to the formal organisation (Araujo, 1998). Since [gaining] knowledge is a never ending process, exceeding any limits, Blackler (1995) calls it knowing instead of knowledge. In conclusion, knowledge cannot be stored; it is dependent upon the situation, including the unique relationships between the members of the learning community.

However, there is debate that surrounds the social learning theories. Fox (2000) maintains that social learning is not a unified field, even in its fundamental assumptions. Further, it is the very contextual and subjective nature of social learning theories that can be an impediment for OL research, particularly in terms of generalisation. What is true in one situation or context is argued to be not true for another. These situational and contextual discrepancies create formidable difficulties in attempting to transfer results

between various contexts. Further, replication is likely to be near impossible. This research has argued that the field of OL is permeated by fragmentation that is hindering advancement, failing to provide reliable and valid support for the claims attributed to the concept, and not giving useful guidelines to practitioners. The social learning perspective is largely unable to address these issues because the validity of findings is difficult to uphold and results are not generalisable which negates any widespread organisational guidelines that can be applied on a broad scale. Whilst it would not be argued that this approach has no merit in the OL field, it can be argued that the plethora of social learning theories continue to provide practitioners and researchers with overwhelming and often incongruous findings (Kim, 2003).

2.3.3 Behaviourism

The behavioural learning approach asserts that learning is directly linked to some action that follows from it. The roots of this perspective are derived from the behaviourist theory which suggests that if no behavioural change is recorded, then no learning can be said to have taken place (Yeo, 2002). Unlike social learning theory which is more relativistic, behaviourism takes a more absolutist approach (DeFillippi and Ornstein, 2003). Behavioural psychology predominates when reviewing previous attempts to empirically assess OL (*e.g.* Crossan *et al.*, 1999; Bontis *et al.*, 2002; Arthur and Huntley, 2005; Skerlavaj *et al.*, 2007). The major benefit of this approach is that behaviours are easily measured, usually by utilising quantitative research, and large scale studies are possible. The major disadvantage however, lies in the fact that this type of approach limits itself to measuring behavioural phenomena without analysing the cognitive roots. As it is possible for behaviour to change without any learning actually occurring, this approach lacks conceptual depth and results can be argued not to be a

result of learning. Further, politics, conflict, systems, motivation, and any number of other factors may interfere with the expression and manifestation of learned behaviours (Yeo, 2002). Fundamentally, as Ford and Kraiger (1995) suggest, a stimulus-response orientation does not capture the complexity of the learning process.

2.4 A COGNITIVE RESEARCH PERSPECTIVE

The social learning perspectives represent a paradigm that espouses OL as being unplanned, largely uncontrollable and context dependent. The aims of this research are to provide a degree of integration in the OL field through theory testing, practitioner guidelines and support, or otherwise, for the OL concept. However, the lack of generalisation and unification of this contextual and subjective approach means the aims of this study cannot be met by social learning perspectives. Behaviourism addresses some of the research problems associated with the social learning approaches as it does provide a method for large scale testing to provide unified theories that are generalisable to varying contexts. However, whether behavioural change is associated with learning is an area of contention as it is argued that learning can occur without any behavioural change. In essence, this perspective does not capture the complexity of the learning process. Cognitivism deals with how people represent the ways they construe the world, as well as how they interpret, try to understand, explain and how we learn. This is a deeper and more direct conceptualisation of learning than behaviourism. Further, cognitive perspectives can be generalised to other contexts, can be measured, and can be linked to action outcomes. In this way, theories can be tested, guidelines for effective learning established, and support for the value, or otherwise, of OL gained. Therefore, cognitivism is the most suitable perspective for this research and is to be employed as the central methodological framework for this study.

2.5 SUMMARY

A foundation was developed for researching OL by differentiating OL from the learning organisation, knowledge management and organisational knowledge concepts and assessing the dominant perspectives utilised within the field. The social learning perspective was dismissed as not being appropriate to the goals of this research, whilst recognising the value of this approach. Behaviourism was more suited to meeting the requirements of this research, but the major concern was the fundamental assumption that behaviour change means learning. It was therefore concluded that the cognitive perspective was the most fitting perspective for the purpose of this research. As an appropriate research foundation has now been developed, the following chapter seeks to build a model of OL, based upon established theory, to enable research into the relationship between OL and organisational performance.

CHAPTER 3

3. Development of a Model of Organisational Learning

3.1 INTRODUCTION

The purpose of this chapter is to develop a model of OL based on the previous chapter's foundations to enable research into OL to meet the aim of empirically studying the process of organisational learning and evaluate the value for organisational performance improvement.

It has been noted that the field of OL is fragmented and Pawlowsky (2001 p.64) writes "It is difficult to judge whether new contributions should be valued as increases in knowledge about organizational learning or whether they just add to the growing diversity...". It was important therefore, that developing a model of OL builds from existing theory and research and does not simply add to the fragmentation, or 'mystification' (Friedman *et. al.*, 2005). Consequently, the following OL model is put forward as a development from established theoretical origins.

The chapter begins by positing that organisations learn only through their individual members and hence, individual learning is the focus of the OL process. The experiential model developed by Kolb (1984), one of the most influential theories of management learning (Vince, 1998), was central to the OL model. It was then proposed that a hierarchy of learning levels exists, higher and lower-level learning, and that both are required for organisational effectiveness. Next, added to the model are active memory structures, or mental models, that highlight the crucial link between individual and organisational learning i.e. the transfer mechanism that allows an organisation to absorb individual learning. Consequently, a model of OL is proposed.

3.2 INDIVIDUAL AS THE FOCUS OF ORGANISATIONAL LEARNING

An important area of debate within the OL field is the question of who? or what? actually learns when addressing OL. Probst and Buchel (1997) posited that the question of who learns? has generally been addressed in two ways. One approach equates OL with learning by individuals within the organisation, and assumes that people and their values, motivations and cognitive capacities and capabilities represent the agents of learning, in contrast to the second approach which attempts to explain OL through distinguishing processes at other levels, including the group, organisational and inter-organisational levels.

For Jelinek (1979) individuals are the only organisational actors capable of learning by means of mental activity and Nonaka (1991) claims that new knowledge always begins with the individual. Simon (1991 p.125) too asserted that “all learning takes place inside individual human heads; an organisation learns in only two ways: (a) by the learning of its members, or (b) by ingesting new members who have knowledge the organisation didn’t previously have”. Carley (1992 pp.230-231) also focused on the individual, “Since organisational or group performance is dependent on the experience and capabilities of individual members (see Hastie, 1986; Shaw, 1981, for reviews), organisations should learn as their personnel learn”. Similarly, Senge (1990) proposed that organisations learn only through individuals who learn. Hence, many of the concepts developed to help describe the phenomenon of individual learning, such as the notions of different ‘levels’ of learning (Fiol and Lyles, 1985) and mental models are crucial for understanding OL. As Argyris and Schon (1978 p.11) write, “it is true that we do apply to organizations many of the terms we also apply to individuals”. More recently, for example, Hodgkinson (2000), Ortenblad (2004), Sun and Scott (2003), Jensen and Rasmussen (2004) and Spector and Davidsen (2006) all focus on the

individual when addressing OL generally based on the premise that individuals are the only organisational actors capable of learning by means of mental activity. Indeed, the basis of the cognitive perspective is that learning occurs in individual minds and so it is the individual that is the focal point. It is also important to note that although for the social learning theorists the primary agents of learning shifts to the group level, the importance of individual learning is also recognised.

Individuals have been deemed as the primary agents of OL, however, it is contended that learning must also encompass the organisation (e.g. Cyert and March, 1963; Fiol and Lyles, 1985; Huber, 1991; Dodgson, 1993; Kim, 1993b; Levitt and March, 1988). It has been considered essential that a distinction between individual and OL is made explicit otherwise “a model of organizational learning will either obscure the actual learning process by ignoring the role of the individual (and anthropomorphizing organisations) or become a simplistic extension of individual learning by glossing over organisational complexities” (Kim, 1993a p.67). Fiol and Lyles (1985) agreed that some distinctions must be made between individual and OL. These authors believe that although individual learning is important to organisations, OL is not simply the sum of each member’s learning. They claim organisations, unlike individuals, develop and maintain learning systems that not only influence their members, but are then transmitted to others by way of organisation histories and norms. Hedberg (1981 p.6) states:

Although organizational learning occurs through individuals, it would be a mistake to conclude that organizational learning is nothing but the cumulative result of their members’ learning. Organisations do not have brains, but they have cognitive systems and memories. As individuals develop their personalities, personal habits, and beliefs over time, organisations develop world views and ideologies. Members come and go, and leadership changes, but organisations memories preserve certain behaviours, mental maps, norms, and values over time.

The organisation itself has been the centre of enquiry for a limited number of contributors who believe that organisations as entities learn. These authors view learning as fundamentally an organisational level phenomenon and include Shrivastava (1983 p.8) who asserts that “OL is an organisational process rather than an individual process” and Levitt and March (1988) who refer to OL as the process whereby organisations encode past experiences and inferences into routines and practices that guide future behaviour. However, the number of contributors who consider OL as independent of individuals is relatively small (Jones, 1995), and for the most part, those recognising the organisation as a potential agent of learning tend to acknowledge the importance of the individual in the learning process (*e.g.* Huber, 1991; Dodgson, 1993; Di Bella and Nevis, 1998). A limited amount of research has also been conducted into learning at the inter-organisational level (Parke, 1991; Inkpen and Crossan, 1995), though it has been indicated that this level of analysis has been added to account for concepts in the strategy literature that can be understood by or supplemented with, aspects of an OL perspective (Crossan *et al.*, 1995).

Therefore, although it is evident that the primary agents of learning referred to by the main contributors to the field involves a degree of divergence, the majority recognise that the individual is crucial. Further, it is contended that they also perceive OL as more than the sum of the learning by individual organisational actors. As Kim (1993b p.37) states, “The importance of individual learning for OL is at once obvious and subtle - obvious because all organisations are composed of individuals; subtle because organisations can learn independent of any specific individual”.

3.3 DEFINING LEARNING

Learning has been extensively studied for decades and examples of research in this field are concepts such as cognitive limitations (Simon, 1957), Pavlov's classical conditioning, Skinner's operant conditioning, Gestalt theory, and Freud's psychodynamics (Hilgard and Bower, 1966; Kim, 1993a), and further models constantly emerge or existing ones revised. Given the breadth of the field, it is important to define 'learning' upon which to base this research as surprisingly, several influential publications relating to OL omit to explain how learning is defined and therefore add to the ambiguity of the construct (Williams, 2001).

Kim (1993a) refers to a dictionary definition of learning as 'the acquiring of knowledge or skill' and contended that by this definition learning encompasses two meanings. Firstly, the acquisition of skill, or know-how, which implies the physical ability to produce some action. Secondly, the acquisition of know-why which implies an ability to articulate a conceptual understanding of an experience. Citing Piaget (1970), Argyris and Schon (1978), Kolb (1984), and Fiol and Lyles (1985), Kim (1993a) asserts that the link between action and thought is defined as integral to the definition of learning. For Kim's purposes and for the purposes of this research, knowledge is defined as the know-how (operational) and know-why (conceptual) of what is learned. Both are needed as interest is not simply in the patterned responses that are picked up in mastering a skill (know-how), but the causal understanding (know-why) that accompanies it. Both are essential for learning to have any significant impact on the learner's ability to take effective action (Kim, 1993a).

3.4 THE PROCESS OF LEARNING

Experiential learning theory (ELT) draws on the work of scholars who gave experience a central role in their theories of human learning and development, such as Dewey, Lewin, Piaget, James, Jung, Friere, and Rogers, to develop a holistic model of the experiential learning process (Kolb and Kolb, 2005). The experiential model of the learning process (see Figure 3.1) is widely cited in management and organisational behaviour. The July 2005 update of the Experiential Learning Theory Bibliography (ELTB) contained 1876 entries and an analysis of the 1999 ELTB found that of the 1004 entries at that time, 207 were studies in management. ELT defines learning as “the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience” (Kolb, 1984 p.42). Kolb (1984) comments that the model offers an holistic, integrative perspective on learning that combines experience, perception, cognition and behaviour. Following this model, an individual learner can be characterised as being engaged in a cyclical process where, having had a concrete experience and having made observations about and reflected upon that experience, they are in a position to develop abstract concepts based upon their observations and reflections. These concepts can then be tested in a new situation, which will in turn lead to new concrete experiences.

It is important to note that the model has received some criticism (*e.g.* Hopkins, 1993; Holman *et. al.*, 1997; Vince, 1998). The essence of the criticism was that ELT decontextualises the learning process and provides only a limited account of the many factors that influence learning. Critics proposed that an emphasis on individual experience comes at the expense of psychodynamic, social, and institutional aspects of learning. Critics from the psychodynamic perspective (*e.g.* Vince, 1998) question the nature of learning and suggest relaxing several assumptions of the initial theory,

including its emphasis on experience, and call for greater emphasis on reflective practices in the learning process. Holman *et. al.* (1978) propose a rethinking of ELT to more explicitly account for social aspects of learning. Institutional critics (*e.g.* Meittinen, 1998) focus on the humanist epistemology of ELT and argue that ELT lacks a strong institutional standing. However, it has been suggested that the critics have overlooked the role of Vygotsky's social constructivist learning theory in the experiential learning theory of development and the role of personal knowledge and social knowledge in experiential learning (Kaye, 2002; Kolb and Kolb, 2005).

Support for Kolb (1984) was provided by Kaye (2002) in reviewing the management learning literature and identifying four general, but not mutually exclusive, agendas as action (*e.g.* Argyris and Schon, 1978; Revans, 1980), cognition (*e.g.* Senge, 1990; Goleman 1998), reflection (*e.g.* Mezirow, 1991; Vince, 1998), and experience (*e.g.* Kolb, 1984; Nonaka, 1994). Kayes (2002) argued that Kolb's ELT occupies a unique place in the study of management learning as it integrates these epistemologies into a formal theory of learning. What distinguishes ELT is not its concern for any single aspect of learning, but rather its concern for the interaction between multiple aspects. Action, cognition, reflection, and experience represent four interdependent processes, each of which is required for holistic integrative learning.

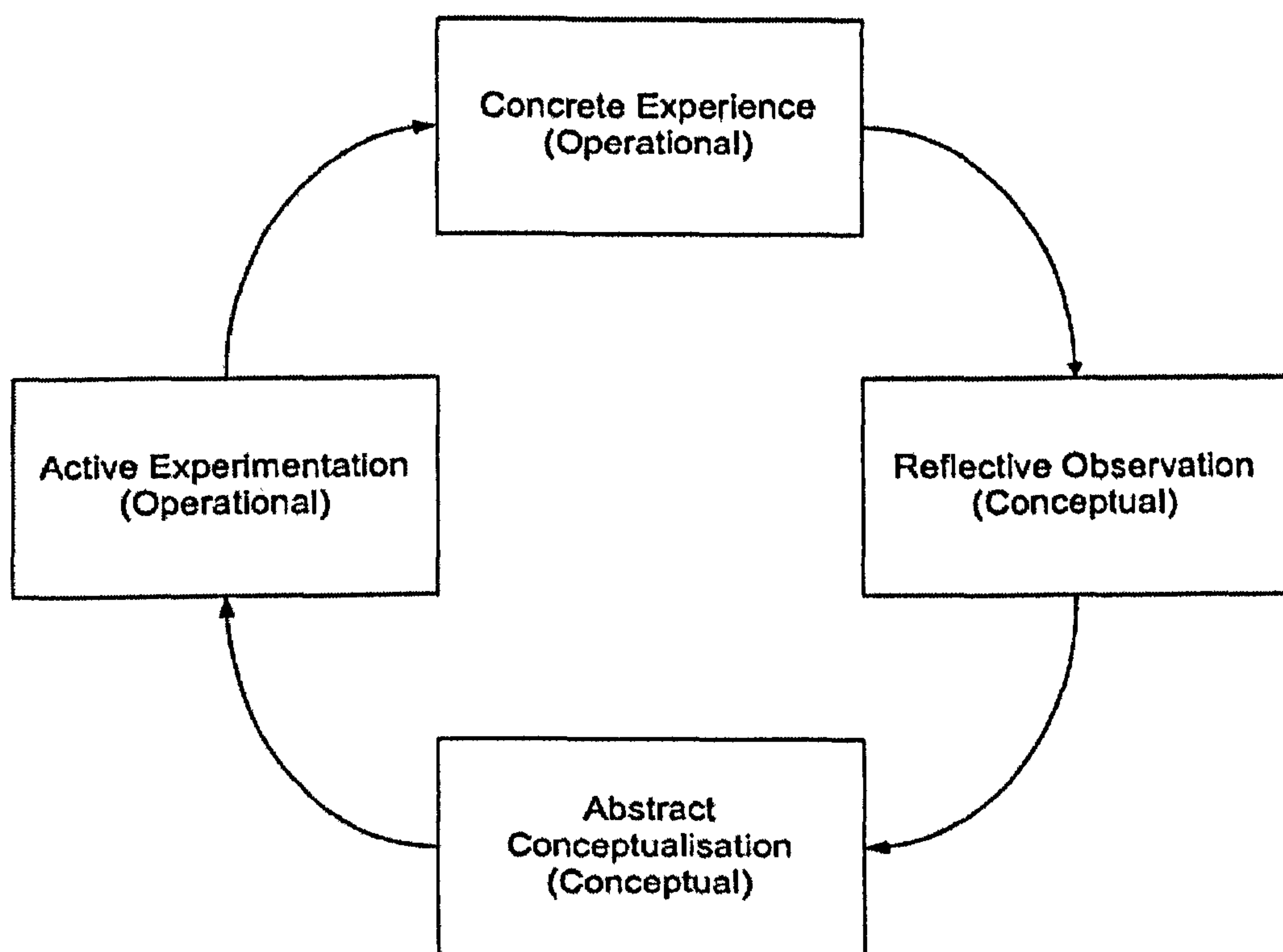


Figure 3.1: Experiential Learning Cycle *(Adapted from Kolb, 1984)*

Kim (1993a) stated that this model is incomplete as it does not explicitly address the role of memory, which plays a critical role in linking individual to OL. This distinction can be made as learning has more to do with acquisition while memory has more to do with retention of whatever was acquired. Kim (1993a) further dissects the memory construct by suggesting that there is a need to differentiate between ‘stored’ memory such as products of rote memorisation and ‘active’ structures that affect thinking processes and actions that are taken. These active structures were referred to as an individual’s mental models and, as was outlined in section 2.2.1, are well established within the field of cognition and OL.

3.5 MENTAL MODELS

The notion that people utilise mental models to represent knowledge originates from Descartes idea of 'imprints' (Cottingham, 1986). According to Descartes, as sensory impulses flow through the nervous system they change the brain, producing mental impressions of external objects. As a result, mental representations mirror reality as perceived through the senses, making the external world accessible by the mind (Stubbart and Ramaprasad, 1990). Early research into imprints by Tolman (1948) using rats caused him to speculate about the existence of cognitive maps in humans, and particularly, about the dangers of narrow cognitive maps. Ashby (1956) and his 'law of requisite variety' provided a theoretical framework both to explain Tolman's intuition and to build a research agenda for the structure of knowledge structures. He argued that if a self-regulating system is to survive, its internal diversity must match the diversity of its environment. Simon (1955) noted that individuals have limited data processing capabilities, yet these limited capabilities must be used to process vast amounts of confusing data (March and Simon, 1958). To make sense of the world, managers must rely on simplified representations or mental models (Keiser and Sproull, 1982).

The concept of mental models has, therefore, been the subject of research for over a century. Senge (1990) defined mental models as deeply ingrained assumptions, generalisations, or even pictures or images that influence how people understand the world and how they take action. Walsh (1995) views a knowledge structure (equivalent to a mental model) as a mental template consisting of organised knowledge about an information environment that enables interpretation and action in that environment. O'Keefe and Nadel (1978) referred to mental models as an aggregate of interrelated information that consist of concepts and relationships an individual uses to understand various situations or environments. They serve as 'maps' allowing individuals to

perceive environments on a larger scale, beyond the range of immediate perception. Further, often people are not consciously aware of their mental models or the effects they have on their behaviour. Narayanan and Fahey (1990) reinforce Tolman's (1948) early ideas by arguing that maps provide a convenient shorthand to describe the lenses which filter data and a means by which data are interpreted (Barr *et al.*, 1992).

Essentially, a mental model embodies a representation or simplification of an individual's view of the world, which includes their knowledge, beliefs and experiences as well as their implicit and explicit understandings (Kim, 1993a; Cope, 2003) and importantly, these mental models direct action (Nisbett and Ross, 1980).

3.6 A MODEL OF INDIVIDUAL LEARNING

Adding mental models to Kolbs (1984) experiential learning cycle (the shaded area in Figure 3.2) provides a representation of an individuals 'active' memory. These mental models surround the learning process as they can be altered at any stage.

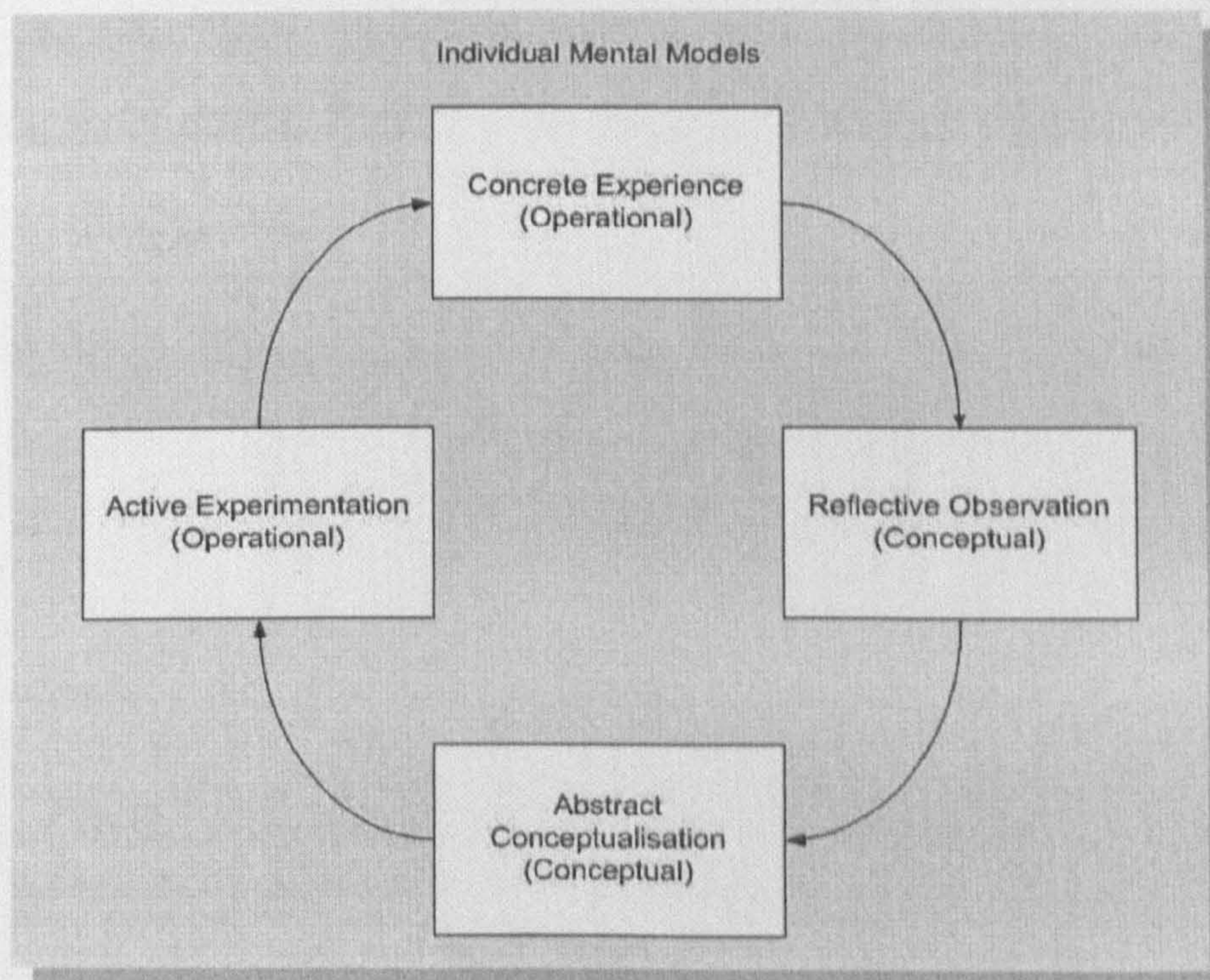


Figure 3.2: A Model of Individual Learning Including Mental Models

3.7 PROPOSITION AND RESEARCH QUESTION

The previous sections have argued that the focus of OL was individual experiential learning. However, ‘organisational’ learning was not simply the sum of individual learning. Essentially, OL is dependent on individual learning, but develops independently of individual learning. The crucial link between individual learning becoming organisational was proposed to be mental models which are active memory structures that dictate action.

Proposition 1: The basis of OL is individual experiential learning. As individuals learn experientially their mental models, which determine potential actions, develop and adjust.

3.7.1 *Research Question 1:*

1. By analysing individual experiential learning what insights can be gained into the OL process?

3.8 LEVELS OF LEARNING

Another important aspect in the development of an OL model is the concept of ‘learning levels’. Early work on a hierarchy of learning levels appears in the work of Ashby (1956) and the British anthropologist Gregory Bateson (1958), but was introduced to the social sciences by Argyris and Schon (1978) and has developed into an important arena of examination into both individual and OL (Visser, 2007). Argyris and Schon (1978) borrow their distinction between single and double-loop learning from Ashby (1956). Ashby formulated his distinction in terms of (a) the adaptive behaviour of a stable system, the region of stability being the region of the phase space in which all the essential variables lie within their normal limits, and (b) a change in the

value of an effective parameter, which changes the field within which the system seeks to maintain its stability (Cope, 2003). Single-loop learning was defined by Argyris and Schon (1978) as instrumental learning that changes strategies of action or assumptions underlying strategies in ways that leave the values of a theory or action unchanged. Double-loop learning is viewed as learning that results in a change in the values of theory-in-use, as well as in its strategies and assumptions. Although these authors advise organisations to engage in double-loop learning, they recognise that both single-loop and double-loop learning are required. Single-loop learning is appropriate for routine, repetitive issues - it helps get the everyday job done, whilst double-loop learning is more relevant for the complex, non-programmable issues - it assures that there will be another day in the future of the organisation (Argyris, 1992).

Following the work of Argyris and Schon (1978) a number of learning level works have emerged that distinguish between more practical, routine, adaptive learning and more fundamental learning that generates new understandings and new cognitive 'theories for action'. These interpretations have been encapsulated within such terms as 'lower-level' and 'higher-level' learning (Fiol and Lyles, 1985); 'surface' and 'deep' learning (Brown, 2000); 'adaptive' and 'generative' learning (Senge, 1990); 'incremental' and 'transformational' learning (Appelbaum and Goransson, 1997) and 'instrumental' and 'transformative' learning (Mezirow, 1990). Further, additional levels based on these classifications have been identified such as 'triple loop' learning (Dodgson, 1993).

Cope (2003) provides an overview:

Table 3.1: Higher and Lower Level Learning (Cope, 2003)

Contributing Theorist	Lower-level learning	Higher-level learning
Gibb (1995)	Learning in order to cope with change and survive	Learning that involves the capacity to 'bring forward' experience
Huber (1991)	Learning within a 'frame of reference'	Learning a new 'frame of reference'
Argyris and Schon (1978)	'Single-loop' learning regards routine, immediate tasks	'Double-loop' learning regards the questioning of underlying values which guide action; implies an awareness of long-range outcomes
Senge (1990)	'Adaptive' learning involves coping with the current environment in new and better ways (cited in Sadler-Smith et. al., 1999) ^a	'Generative' learning moves beyond adaptation, requiring individuals and organisations to develop new ways of looking at the world (cited in Sadler-Smith et. al., 1999)
Mezirow (1990,1991)	'Instrumental' learning is involved in task-oriented problem solving - how to do something or how to perform. Regards developing an understanding of the procedural assumptions guiding the problem solving process	'Transformative' learning has the capacity to transform an individual's meaning perspectives' - perceptual and conceptual frameworks that form, limit and distort how individuals think, believe, feel and what, when and why they learn
Pask (1976)	'Serialist' strategy involves detailed, step-by-step approach from one idea to the next without necessarily considering the whole picture	'Wholist' strategy involves learning in relation to the whole
Fiol and Lyles (1985)	Occurs through repetition and routine, short-term outcomes	Has long-term effects; more of a cognitive process that involves skill development and new insights
Appelbaum and Goransson (1997)	'Adaptive' learning involves more mundane, everyday, incremental learning	'Transformational' learning involves radical change; learning that requires a shift in 'mindset'

Note: ^a for the purposes of this table, Sadler-Smith et. al. (1999) are cited here as they provide useful and succinct definitions of adaptive and generative learning that are not clearly apparent in Senge's (1990) original work.

The primary features that distinguish between these two different levels of learning cited within the learning literature are often very similar. For certain theorists,

the various descriptions mentioned are even viewed as synonymous, with the terms 'higher-level', 'generative', 'transformational' and 'double-loop' being used interchangeably (Appelbaum and Goransson, 1997; Nevis *et al.*, 1995). Therefore, choosing terms becomes somewhat arbitrary, but for the purpose of this research Fiol and Lyles (1985 p.810) 'lower-level' and 'higher-level' learning terms are utilised as they incorporate a number of authors' ideas:

Lower-level learning: Focused learning that may be mere repetition of past behaviours— usually short-term, surface, temporary, but with associations being formed. Captures only a certain element . . . Single loop, routine level.

Higher-level learning: The development of complex rules and associations regarding new actions. Development of an understanding of causation . . . Double loop learning. Central norms, frames of reference and assumptions changed.

However, Sadler-Smith *et al.* (1999 p.881) question whether learning levels can be presented in discrete, dichotomous terms and propose the levels are actually part of a continuum. Consequently, these authors point out that differentiating between different levels of learning is often very difficult, as they remain inextricably linked and indistinct. As a result "identifying where adaptive learning stops and generative learning starts is difficult and often relies to a certain extent upon the subjective assessment of the analyst".

3.9 LEARNING LEVELS AND ORGANISATIONAL OUTCOMES

Although Argyris and Schon (1978) claim that single-loop and double-loop learning are both required by organisations, their concern was that most organisations only undertook single-loop learning which left the values and norms underpinning a strategy or action unchanged. This lack of change prevents organisations learning from their errors and, potentially, leads to failure. As a result they advocated double-loop learning which will challenge current assumptions and actions and lead to new theories-

in-use (Blackman *et. al.*, 2004). However, not all recognise that one level is inherently 'better' than the other, such as Kim (1993b), who recognised both 'know-how' and 'know-why' as being essential in order for learning to have any significant impact on the learner's ability to take effective action. Where agreement does predominantly exist is that both are required by organisations and lower-level learning is couched as appropriate to guide the everyday behaviours of the organisation, whilst the implications for the new understandings achieved through higher-level learning are to promote the attainment of radical change, innovation and long-term success (Senge, 1990; Appelbaum and Goransson, 1997; Fiol and Lyles, 1985; Argyris and Schon, 1978).

It must be recognised that the role of higher-level learning in creating long term organisational success cannot be taken for granted. Blackman (2004) questioned whether double-loop learning created reliable knowledge and Fiol and Lyles (1985 p.808) note that "sometimes the results of higher level learning become dysfunctional if it creates the development of superstitions, associations, or norms that support dysfunctional behaviours". However, the effectiveness of learning and consequent outcomes for the organisation, at least in part, is dependent upon the extent of higher versus lower level learning the individual undertakes and can be added to the model (Figure 3.3).

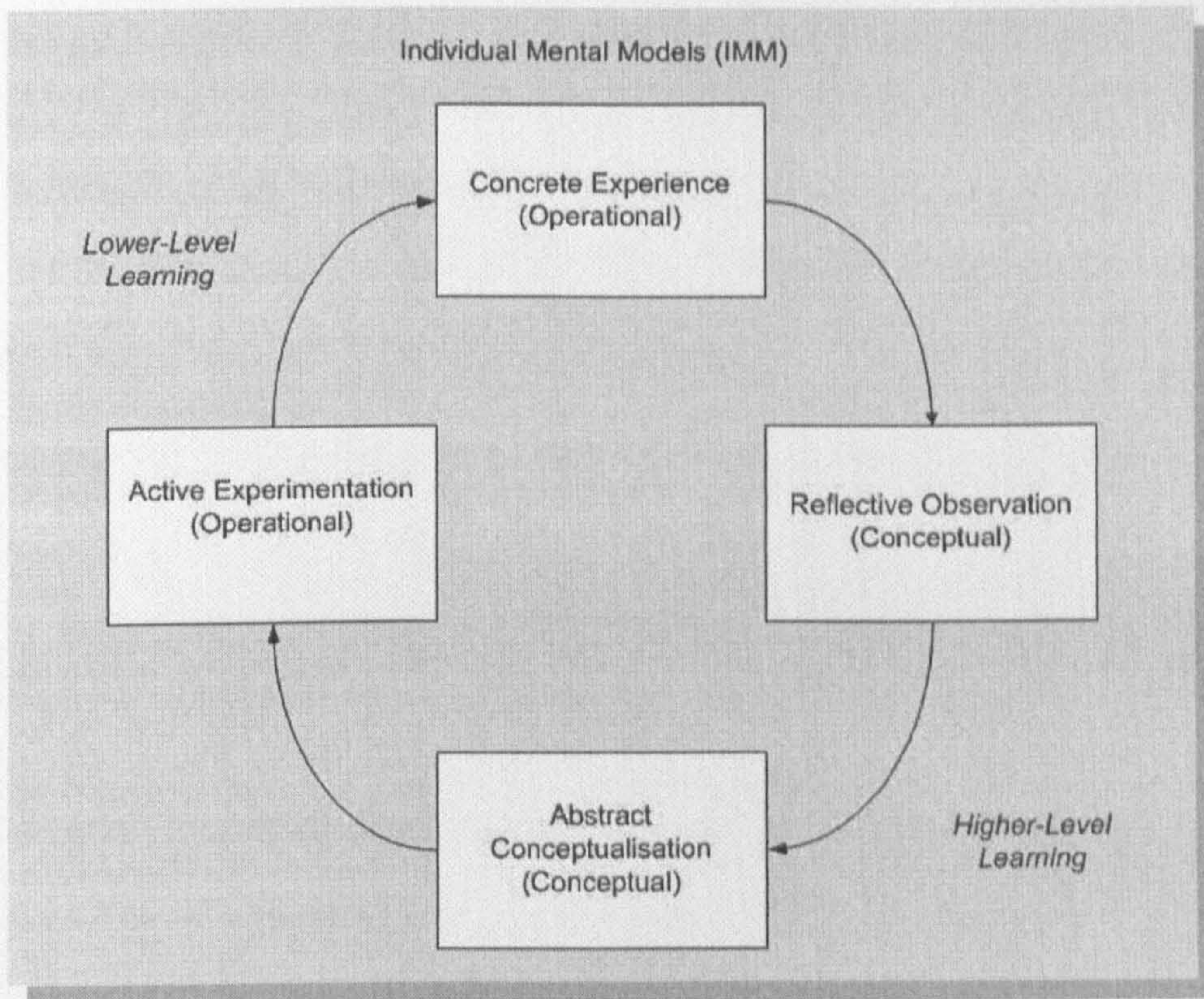


Figure 3.3: A Model of Individual Learning Including Mental Models and Levels of Learning

3.10 PROPOSITION AND RESEARCH QUESTION

This section has outlined a well established theme in individual and organisational learning literature as being the identification of different levels of learning. While it is contested as to whether one level is inherently ‘better’ than the other, there is broad agreement that a difference exists and certain levels are more appropriate for particular organisational circumstances and situations.

Proposition 2: Individuals may undertake lower-level learning to guide the everyday operation of the organisation or higher-level learning to create new understandings and contribute to long term organisational success

3.10.1 Research Question 2:

- 2. Can higher level and lower level learning be identified and categorised in organisations?**

3.11 THE INDIVIDUAL / ORGANISATIONAL RELATIONSHIP

The development of the OL model for this research has proposed that mental models are crucial in linking individual learning to OL and this section seeks to explicate this process.

The relationship between individual and OL is a key aspect of debate within OL literature. Kim (1993a) claims how individual learning is transferred to the organisation is 'the crucial issue'. Crossan *et. al.* (1995) add that the majority of the literature suggests that OL means acquiring a high level of individual, group and OL, yet the relationship between these various levels is something that warrants increased attention from researchers. Tsang (1997) comments that although certain aspects of OL have been studied rather well, there is a relative non-existence of research into the link between individual and OL. There is, however, a growing body of literature that is examining how individual cognition can be shared and institutionalised. According to OL literature, factors such as processes of dialogue (Senge, 1990), communities of interaction (Nonaka and Takeuchi, 1995), negotiations and arguments (Langfield-Smith and Wirth, 1992), information sharing and transfer (Huber, 1991) allow for the sharing, validating, and integrating of individual and group learning into OL (Duncan and Weiss, 1979; Gnyawali and Stewart, 2003). Gnyawali and Stewart (2003 p.65) provide an outline of the organisational mechanisms that facilitate this sharing and integration and include:

...strategy, culture, and structure (Ford and Baucus, 1987), microworlds or learning laboratories (Kim, 1993; Senge, 1990), and a complex array of administrative and human processes (Edmondson and Moingeon, 1996). Popper and Lipshitz (2000) argue that institutionalized structural procedural arrangements, which they call 'organizational learning mechanisms' make organizational learning possible. Such mechanisms are at the organizational level yet are operated by individuals and used to disseminate individual knowledge throughout the organization. These organizational mechanisms provide a basis for developing and retaining the stock of knowledge and making such knowledge flow at multiple levels in the organization (Bontis and Crossan, 1999; Crossan et al., 1999). Thus, for organizational learning to occur, organizations must have internal mechanisms and processes that allow accumulation and distribution of relevant information. Organizations also need mechanisms that support dialogue and interaction so that knowledge structures or a stock of organizational knowledge can be developed and disseminated throughout the organization.

Duncan and Weiss (1979 p.89) adhere to this view, stating that “while the individual is the only entity in the organisation who can learn, this must be viewed as part of a system of learning with exchanges of what is learned among individuals”, and argued that learning involves the development of action/outcome relationships through the sharing, evaluation and combination of the learning of individual organisational actors. OL is about building an organisational understanding and interpretation of the environment and results in associations, cognitive systems, and memories that are developed and shared by members of the organisation through individual cognitive change (Fiol and Lyles, 1985).

The implication was that organisations need to focus on creating an effective learning environment that facilitates open communication and dialogue (Pedler *et. al.*, 1991). The adoption of flat, decentralized organisational structures, team working, reward systems that centre on learning goals, and participation in decision making are some cited examples of how organisations can create effective learning environments (Garvin, 1993; Watkins and Marsick, 1993; Armstrong and Foley, 2003). Lick (2006) draws attention to enhancing OL by the use of collaborative processes such as learning teams and professional learning communities. These efforts are part of what Beyerlein

(2003) defines as collaborative work systems in which a conscious effort has been made to create strategies, policies and structures and institutionalise values, behaviours and practices that enable individuals and groups to effectively work together to achieve desired results and organisational goals. However, Shipton (2006) notes that much of this literature has to some extent masked the problems and difficulties associated with learning. For example, knowledge transmission is seen to happen automatically as a result of introducing and implementing the necessary mechanisms (Huysman, 2000). OL follows where individuals are willing to talk openly and honestly about the concerns and anxieties they hold (Argyris and Schon, 1978; Argyris, 1990). Problems can be addressed by introducing a third party whose task it is to enable individuals to overcome the defensive attributes they exhibit (Argyris and Schon, 1978; Argyris, 1990). As Friedman *et. al.* (2005) have pointed out, transferring learning to effect organisational level change is enormously complicated, depending upon individual, job and structural characteristics, as well as the existing learning culture and reward/ recognition systems.

The link between individual learning and OL has been identified as articulating and sharing individual mental models to develop an organisational understanding, but it has been noted that there are a number of potential factors that may influence this process. Delineating the nature of 'organisational understanding' leads to the concept of shared mental models, which has been the subject of some debate, and hence the next section seeks to clarify and define the theory.

3.12 SHARED MENTAL MODELS

Walsh (1995) writes the idea that a group of individuals can serve as a repository of organised knowledge and that this repository can act as a template for interpretation and action has origins that date back to the ideas of the French sociologist

and philosopher Durkheim. In his discussion of the social origins of individual behaviour, Durkheim (1895 p.1vi) argued that there are “collective ways of acting or thinking [that] have a reality outside of the individuals who, at every moment in time, conform to it”. Durkheim’s student, Fleck (1938 p.38), developed this idea further and argued that “cognition is ... not an individual process of any theoretical ‘particular consciousness’. Rather, it is the result of a social activity, since the existing stock of knowledge exceeds the range available to any one individual”. He argued that this stock of knowledge is housed in a ‘thought collective’. Another of Durkheim’s students, Halbwachs (1950 p.51), believed that “a man must often appeal to others’ remembrances to evoke his own past”. A group whose members help evoke those remembrances is said to have a collective memory. For Halbwachs, however, the concept of a collective memory represented an emergent retrieval process, rather than some kind of discrete retention facility. Durkheim and his students are credited as being the first to consider that groups of individuals may house knowledge about issues in a way that transcends the cognitive facilities of any one of them. These ideas are the intellectual foundation for the more contemporary considerations of collective (or shared) mental models (Walsh, 1995). It is important to note that in contrast to the conceptualisation that shall be built regarding shared mental models in this research, Durkheim did not agree that collective ways of thinking and acting are derived from their being held in common by most of the individual members and that, in this sense, the characteristics of the whole are the product of the characteristics of the parts. Rather, social facts are repeatedly manifested in individuals because it is imposed upon them, particularly through education, therefore the parts are derived from the whole rather than the whole from the parts.

Durkheim (1895) and Fleck's (1938) early ideas about collective thought have been developed more recently. Levine *et. al.* (1993 p.599) observed that "outside the laboratory and the school, cognition is almost always collaborative". Such views have prompted a number of writers to examine the work on individual knowledge structures and conclude that when a group of individuals are brought together, each with their own knowledge structure about a particular information environment, some kind of emergent collective knowledge structure is likely to exist. This group level representation of an information environment would act just like an individual's knowledge structure. It too functions as a mental template that when imposed on an information environment gives it form and meaning, and in so doing serves as a cognitive foundation for action. The group-level knowledge structure has been variously called a collective cognitive map (Axelrod, 1976), a team mental model (Klimoski and Mohammed, 1994), a collective cognition (Langfield-Smith and Wirth, 1992), a hypermap (Bryant, 1983), an intersubjectivity (Eden *et al.*, 1981), a dominant logic (Prahalad and Bettis, 1986), and a negotiated belief structure (Walsh and Fahey, 1986). As a group approaches a decision issue, information is thought to be acquired, retained, and retrieved within the parameters set by this group-level knowledge structure (Levine *et. al.* 1993). Walsh (1995) cites Ford and Baucus (1987) and Langfield-Smith (1992) as offering a theoretical assessment of group-level knowledge structure development in organisations. Langfield-Smith (1992) argued that central was the interaction of cognition and social process to understanding how collective knowledge structures are formed. As a group comes together, some aspects of the individuals' cognitive maps will overlap and some will not. A shared cognitive map emerges from a social process marked by negotiation and argument, as well as by a multitude of unarticulated internal and external triggers for change. It is suggested that individuals may either update their knowledge structures

themselves in relation to the information environment or knowledge structure change may be a function of social influence processes. Walsh (1995) as well as Lyles and Schwenk (1992) have called this collective cognition an 'organizational knowledge structure'. An organizational knowledge structure refers to shared understanding at the organizational level (Lyles and Schwenk, 1992).

Kim (1993b p.44) utilised the mental models terminology rather than knowledge structures and provided an outline of mental models, shared mental models and the relationship to OL:

The parts of an organisations memory that are relevant for organizational learning are those that play an active role in defining what an organisation pays attention to, how it chooses to act, and what it chooses to remember from its experience. This is what we mean by mental models and shared mental models. They may be explicit or implicit, tacit or widely recognised, but they have the capacity to affect the way an individual or organisation views the world and the actions that are taken. organizational learning is dependent on individuals improving their mental models; making those mental models explicit enough to be shared mental models allows organizational learning to be independent of any specific individual. Why are we putting so much emphasis on mental models? Because the mental models in individuals heads are where a vast majority of an organisations knowledge (both know-how and know-why) lies.

According to the proposals presented, a shared mental model contains concepts held by a majority of the group, not simply the summation of all individuals' mental models. Because some components of the individuals' mental models will overlap, whereas others may not, a shared mental model will develop as a unique entity, different to that of any individual. In an organisation, many of these shared mental models will develop and change over time comprised of components of varying individuals' mental models. It is the change in these shared organisational knowledge structures (shared mental models) that constitutes OL. Importantly, 'organisational' learning does not have to include all members of the organisation and it is unlikely that shared mental models would exist across the entirety of any but the smallest organisations. Shared mental models can develop in any number of individuals equal to, or greater than, three to be

able to develop as a unique entity. One individual would constitute individual learning, whilst the shared components of two individuals' mental models could only be those concepts held in common and cannot develop as a unique entity. What makes a change in the shared mental models of three or more organisational members 'organisational' learning is the fact that the learning is at a level above individual learning, develops as a unique entity and any resultant action based on this affects the organisation. The rationale of this distinction therefore differentiates 'organisational' from 'group' learning as any actions as a result of group learning would only affect the group. Figure 3.4 represents the rationale of the development of a shared mental model:

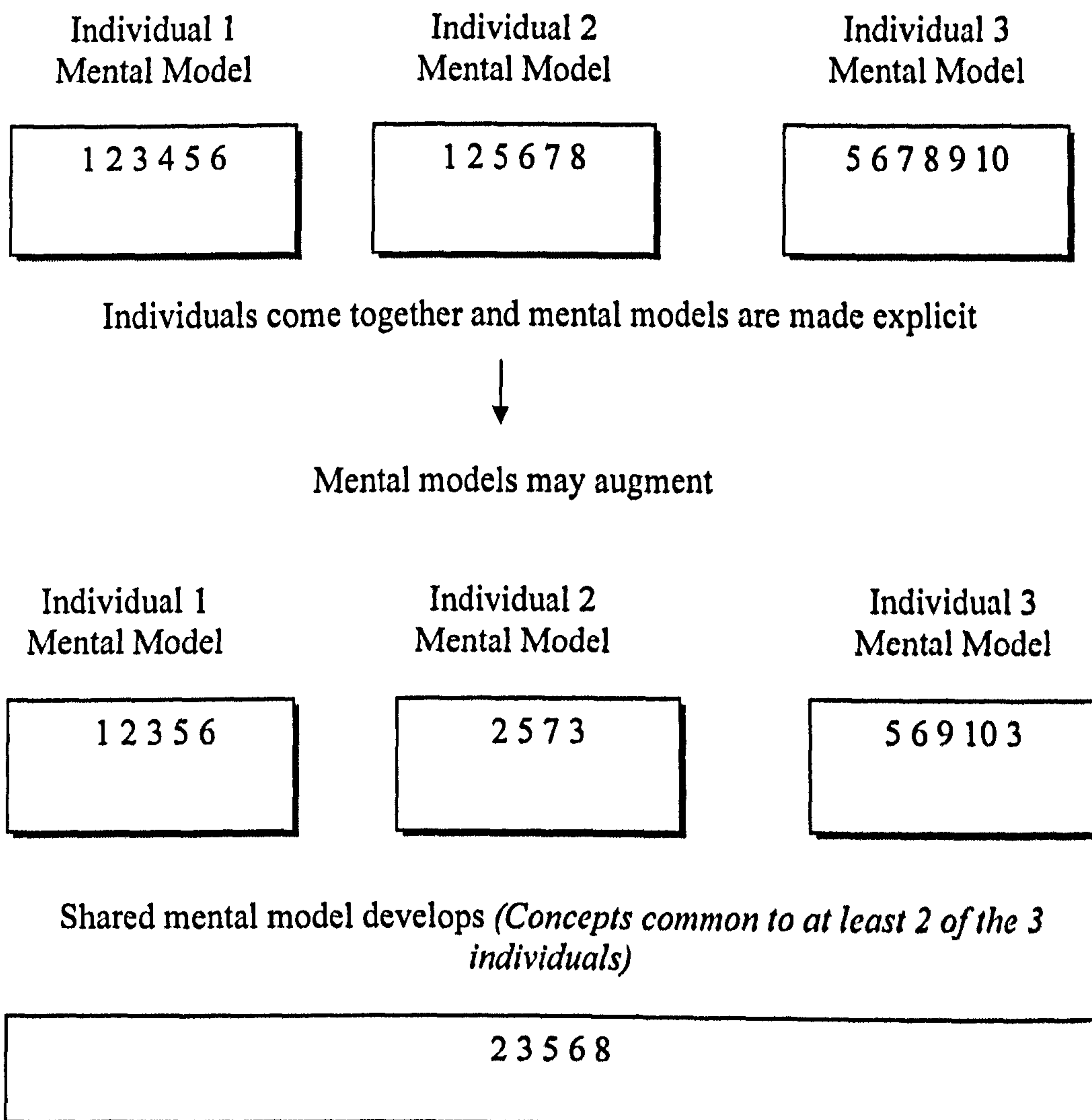


Figure 3.4: The Formation of a Shared Mental Model

The example in Figure 3.4 displays that as three individuals come together and articulate their mental models, the sharing of information and knowledge may result in any of the individuals augmenting their mental models. A shared mental model then develops that contains concepts (represented by numbers) held by a majority of the individuals that is a unique entity, different to that of any individual. A change in shared mental models that are focused on organisational action represents OL.

These shared mental models can be added to the individual learning model to formulate a model of OL (see Figure 3.5).

3.13 A MODEL OF ORGANISATIONAL LEARNING

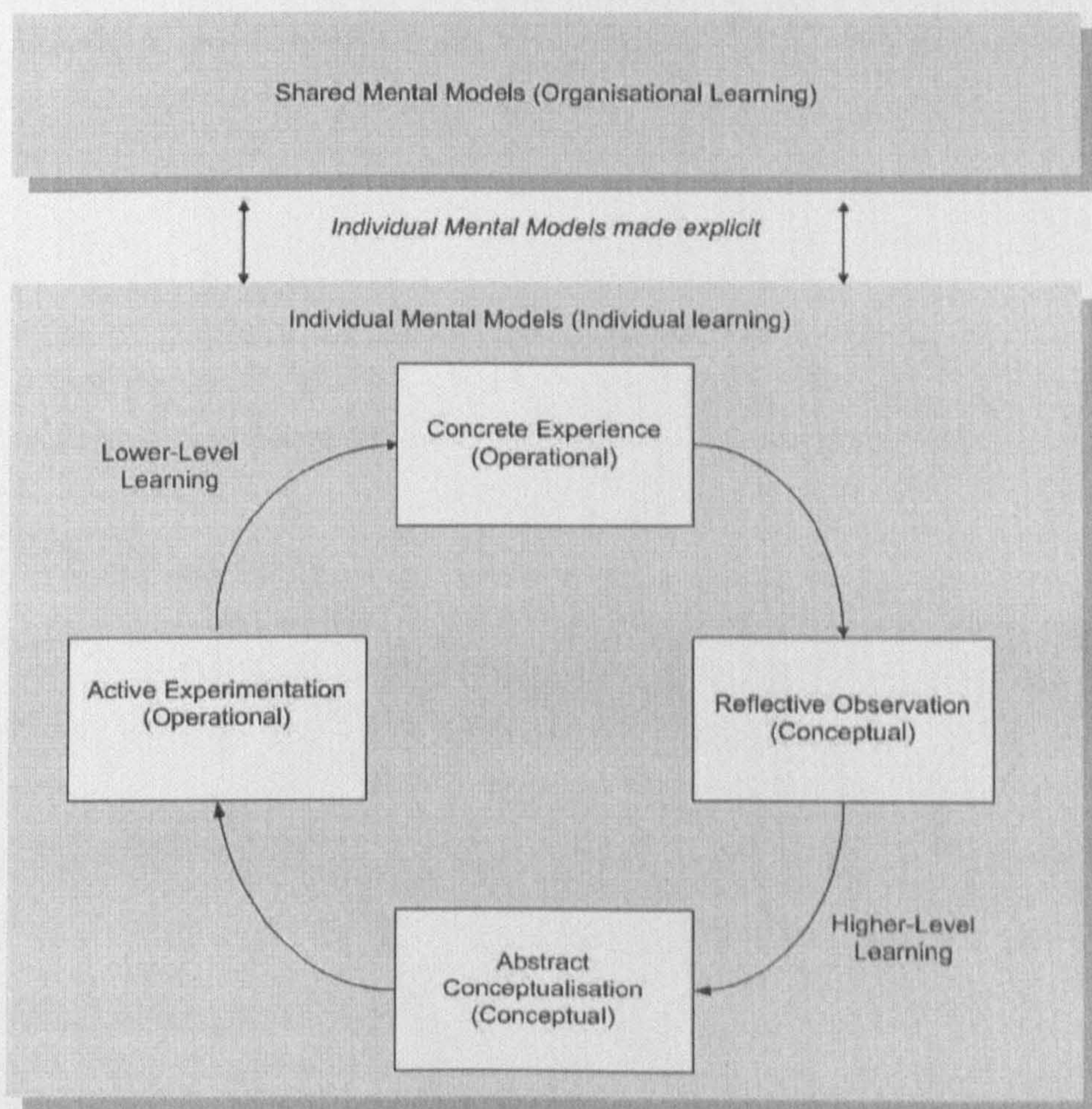


Figure 3.5: A Model of Organisational Learning

As individuals learn experientially their mental models develop and adjust. In an organisational context, as these mental models are made explicit in groups of three or more, shared mental models may develop. Over time, as long as any resultant action will affect the organisation, change in the shared mental model constitutes organisational learning.

Therefore, OL can be defined as:

A process of continuously acquiring organisational knowledge through individual organisational members that is shared to result in collective learning

3.14 PROPOSITION AND RESEARCH QUESTIONS

Proposition 3: As individuals learn experientially their mental models develop and adjust. In an organisational context, as these mental models are made explicit in groups of three or more, and processes such as negotiation and argument may ensue, shared mental models develop. Over time, as long as any resultant action will affect the organisation, change in the shared mental model constitutes organisational learning.

3.14.1 Research Questions:

3. As organisational learning occurs through individual experiential learning, is it possible to represent OL by analysing individual mental models?
4. By measuring individual learning over time, can OL be measured?
5. Can these OL representations and measurements be deconstructed to analyse the formation and development, and hence process, of OL?

3.15 SUMMARY

The aim of this chapter was to develop a model of OL that can be examined in this research. Importantly, the model needed to be founded on and build from earlier research to provide a coherently developed and supported model. For example, the *Development of a Model of Organisational Learning*

experiential learning model is incorporated into the learning models of Daft and Weick (1984); Kim (1993a); Dixon (1994); Van der Heijden and Eden (1995); Spicer (2001); Campbell (2005); Campbell and Armstrong (2005) and the mental models concepts are recognised as elements of OL by, for example, Argyris and Schon (1978); Daft and Weick (1984); Senge (1990); Kim (1993a); Spicer (2001); Jensen and Rasmussen (2004); Campbell (2005) and Campbell and Armstrong (2005).

The chapter began by arguing that the individual was the basis for OL as individuals are the only organisational actors capable of learning by means of mental activity. Learning was then defined as acquiring two types of knowledge, know-how (operational) and know-why (conceptual), both of which are needed for effective action. The means by which individuals acquire this knowledge is described by Kolb's (1984) experiential learning theory. Added to this were mental models, active memory structures which represent an individual's interpretation of the world and from which action is directed. Based upon the proposition that learning requires the acquisition of two types of knowledge, the concept of a hierarchy of learning levels, lower-level and higher-level, that individuals can undertake was proposed and argued that both are necessary for organisational effectiveness. Shared mental models were outlined as being a fundamental component of OL that emerge when individual mental models are made explicit through social processes and a multitude of unarticulated signals for change. Shared mental models develop as a unique entity in any group of individuals with three or more members and, just like individual mental models, are a basis for action. As individuals acquire organisational knowledge through learning, their mental models develop and adjust, as if these mental models are made explicit, so too does the shared mental model. It is the change in the shared mental model that constitutes OL.

The following chapter extends the OL model to include the connection with organisational performance and hence provide a research model to analyse the process and value of OL.

CHAPTER 4

4. Organisational Learning and the Link to Organisational Performance

4.1 INTRODUCTION

Having developed a model of OL, the following chapter seeks to extend this model to account for organisational performance in order to allow research into their relationship. The chapter recognises a key premise of strategic management is that there must be a fit between an organisation and its environment to remain competitive and survive over the long term and it is proposed that OL is crucial in maintaining this alignment. It is argued that OL processes help organisations gain a broader understanding of both the external and internal environments in comparison to individual learning. The result of the OL process is the creation of a shared vision on how the organisation can compete and produce coordinated action which draws from this. Adding these propositions to the OL model results in a researchable OL/organisational performance model. The chapter concludes with a cautionary note that OL does not automatically mean improved organisational performance and draws attention to the factors which influence the effectiveness, both positively and negatively, of OL.

4.2 ORGANISATIONAL LEARNING AND COMPETITIVE ADVANTAGE

In a world characterised by rapid change and ambiguous signals, the ability of organisations to interpret the environment and to respond accordingly has been argued to be crucial for positive organisational performance. Burnes (2000) noted that it has become the generally accepted view that, for society at large, the magnitude, speed,

unpredictability and impact of change are greater than ever before. He asserts that there are few issues relating to organisations on which there is broad agreement among and between academics and practitioners, however, one of the areas where substantial agreement does appear to exist is that organisations are facing unprecedented levels of change (Burnes, 2005). Remaining competitive in such an environment has become a continual process for the majority of organisations. Sooner or later, all firms will find that the old ways of behaving will eventually fail to produce the required performance and change will be needed. When confronted with these performance problems, it is claimed that firms will look towards learning solutions to survive (Vakola, 2000; Gilley *et al.*, 2001) and OL has been identified as a capability required of all firms (*e.g.* Garvin, 1993; Edmonson and Moingeon, 1998).

Lopez *et al.* (2005) note that OL is considered to be one of the fundamental sources of competitive advantage within the context of strategic management. Theorists argue that in volatile environments the capacity to learn faster than competitors may be the only sustainable competitive advantage (*e.g.* De Geus, 1988; Stata, 1989). As innovation, change and organisational renewal become more critical bases of competitive advantage, dynamic capabilities are likely to be seen as more important proprietary resources that sustain a given position (Hedlund, 1994). Lopez *et al.* (2005) write that analysing the organisation in terms of its design and ability to process information constitutes an important approach to interpreting certain aspects of organisational activities (Nonaka and Takeuchi, 1994). However, it can be argued that the organisation's interaction with its environment, together with the way it creates and distributes information and knowledge, are more important when it comes to building an active and dynamic understanding of the organisation.

Consequently, many authors consider learning to be a fundamental aspect of competitiveness and link it with knowledge acquisition and performance improvement. Jones (2000) emphasised the importance of OL for performance, defining it as a process by which managers try to increase employees' capabilities in order to better understand and manage the organisation and its environment, to accept decisions that increase organisational performance on a continual basis. In examining the sustainability of competitive advantage, Williams (1992) found that all industries undergo substantial change, whether driven by customers, competitors or technology suppliers. This change creates continuous pressure for businesses to improve their products and services to maintain or increase their value to customers, because no customer benefit is safe from being matched or exceeded by competitors. Because of this reasoning, Lopez *et. al.* (2005 p.229) comment that, "It is no surprise that comments such as "the ability to learn faster than competitors may be the only sustainable competitive advantage" (De Geus, 1988 p.71) have been frequently paraphrased by executives and scholars (Stata, 1989; Nonaka, 1991)".

It is proposed that OL establishes a link between the organisation and the environment that encourages proactive rather than reactive behaviour. The knowledge resulting from learning implies an improvement in response capacity through a broader understanding of the environment (Dodgson, 1993; Sinkula, 1994). The OL process helps people discover why problems are seen in a one-dimensional framework, posing questions of the current systems, and challenging and questioning paradoxes as they occur (Murray and Donegan, 2003). Learning, through better knowledge and understanding, facilitates behaviour change that leads to improved performance (Fiol and Lyles, 1985; Senge, 1990). Firms that are able to learn about customers, competitors and regulators stand a better chance of sensing and acting upon events and

trends in the marketplace (Tippins and Sohi, 2003). Further, OL is valuable to a firm's customers because it focuses on understanding and effectively satisfying their needs through new products, services and ways of doing business (Slater and Narver, 1995) which should lead directly to superior outcomes. These might include greater new product success, superior customer retention, higher customer-defined quality, and, ultimately superior growth and/or profitability (Slater and Narver, 1995; Bontis *et. al.*, 2002). OL is, therefore, argued to be crucial for an organisation to be able to interpret the environment and respond accordingly.

4.3 THE ORGANISATIONAL ENVIRONMENT AND ORGANISATIONAL PERFORMANCE

Even a cursory review of organisational strategy literature highlights the generally acknowledged view that gaining an adequate understanding of the wider business environment in which the organisation is seeking to operate is vital to the formulation and implementation of an effective business strategy (*e.g.*, Hitt *et. al.*, 1996; Grant, 1998; De Wit and Mayer, 2004; Johnson and Scholes, 2005). De Wit and Meyer (2004 p.245) claim "There must be a fit between an organisation and its environment", and state that the key to success is alignment of the two sides. This is a key premise of strategic management and derives from the work of, amongst others, Lawrence and Lorsch (1967) and Thompson (1967). Hodgkinson and Sparrow (2002) propound that researchers have stated successful organisations develop strategies that enable them to quickly and effectively take advantage of, or align with the environment (*e.g.* Prahalad and Hamel, 1990; Grant, 1996). The importance of the environment on organisational performance is emphasised by Johnson and Scholes (1999 p.79) who explain the concept of strategic drift. These authors note that strategic drift occurs when the

“organisation’s strategy gradually moves away from relevance to the forces at work in its environment”. The consequences of strategic drift is to negatively affect organisational performance. It is also important to note that organisations that seek to stretch core competencies to create new opportunities can become ahead of the environment and this also “could cause significant problems, not least in performance” (p.82).

The two predominant perspectives on business level strategy (outside-in or inside-out) differ in how environmental fit should be achieved. Essentially, the question is ‘who should be fitted to whom?’ should an organisation adapt itself to its environment or should it attempt to adapt the environment to itself? Should managers take the environment as the starting point, choose an advantageous market position and then build the resource base and activity system necessary to implement this choice? Or should managers take the organisations resource base as the starting point, selecting and/or adapting an environment to fit with these strengths? (De Wit and Mayer, 2004 p.249). Whichever perspective prevails, an understanding of the environment is an essential element. De Wit and Meyer (2004 p.231) write that strategic management is concerned with relating a firm to its environment in order to successfully meet long term objectives. As both the business environment and individual firms are dynamic systems, constantly in flux, achieving a fit between the two is an ongoing challenge. Managers are continuously looking for new ways to align the current, and potential, strengths and weaknesses of the organisation with the current, and potential, opportunities and threats in the environment.

Strategic management literature accentuates the importance of understanding and responding to environmental factors and the consequent effect on organisational

performance. It is proposed that it is primarily the role of an organisation's top managers to interpret and respond to their environment.

4.4 TOP MANAGEMENT AND ORGANISATIONAL PERFORMANCE

The influence of top management on organisational performance has been well documented. For example, Hambrick and Mason's (1984 p.197) 'upper echelons' perspective suggested that observable characteristics of top managers are "determinants of strategic choices and, through these choices, of organizational performance". This research renewed interest in top managers and top management teams and their influence on organisations and subsequent studies successfully linked top management characteristics to organisational outcomes (e.g. Norburn and Birley, 1988; Eisenhardt and Schoonhoven, 1990; Finklestein and Hambrick, 1990; Thomas *et. al.*, 1991; Wiersema and Bantel, 1992). The message being that "Top managers do appear to matter" (Priem, 1996 p.113).

Research within this field was aided by a paper by Richard Priem (1994) studying executive judgement, organisational congruence, and firm performance which provided explicit linkages between managerial judgement policies and organisational performance. The importance of this paper was that it showed researchers how, with careful methodological attention, "researchers can tease apart, in theoretically useful ways, the cognition-behaviour-performance nexus" (Meindl *et. al.*, 1996 p.xx). Priem (1994) cites contingency theory when suggesting that a match among business-level strategy, organisational structure, and the competitive environment is necessary for high performance. Outcomes of the study support this proposal as Priem states (1996 p.113), "These results suggest that the judgement of top executives is important to both organizational alignment and firm performance". He continues, "This study found

rationality in the strategy-making process, represented by the levels of scanning, analysis and planning reported by top managers of manufacturing organizations, to be positively related to firm performance” (p.136). This supports earlier research such as Schoemaker (1990) who argued that executive judgement represents an important source of sustainable competitive advantage. Research into the importance of top management teams dates back to at least the work of Penrose (1959), who recognised that an executive’s knowledge of the external world is a key productive resource for the firm. Almost fifty years of research later, these conclusions continue to be vindicated. For example, a review by Lohrke *et. al.* (2004 p.63) on the role of top management teams in formulating and implementing turnaround strategies noted that, “It is generally recognised that a firm’s top management team (TMT) takes on particular importance during periods of declining performance. To be successful in such situations, a TMT must quickly and accurately determine the cause of a firm’s performance lapse and implement decisions necessary for its prompt recovery (i.e. turnaround). Other things equal, a TMT’s failure to manage a firm’s turnaround process properly will result in its continued decline and eventual economic failure or bankruptcy (Weitzel and Jonsson, 1989)”.

The crucial intermediary between an organisations environment and organisational performance has been identified as being top managers who are primarily responsible for interpreting and responding to the environment. The following section proposes that top managers interpret and respond to the environment according to their mental models.

4.5 ENVIRONMENTAL FIT AND TOP MANAGEMENT COGNITION

Mintzberg *et. al.* (1998 p.150) recognised the importance of the cognitive perspective of strategy when they wrote “If it can deliver on its intentions, it could very well transform the teaching and practice of strategy as we know it today”. These authors propose that managers carry around in their heads all kinds of mental models and their impact on behaviour can be profound. For example, Barr *et. al.* (1992) compared two railroads, Rock Island and C&NW, over a twenty-five-year period (1949-1973). They were similar to begin with, but one eventually went bankrupt while the other survived. The researchers attributed this to their managers’ causal maps about the environment. Initially, both firms ascribed poor performance to bad weather, government programs, and regulations. Then one firm’s mental maps shifted to focus on the relationship between costs, productivity, and management style, and that provoked the necessary changes (Mintzberg *et. al.*, 1998).

In the late eighties Fahey and Narayanan (1989) recognised the link between environmental fit and cognition and wrote that the general thrust of empirical work during the last two decades suggests that in successful organisations, there tends to be a fit between environmental conditions and organisational factors and a number of authors have highlighted the role of cognitive maps in the adaptation process. Hedberg and Johnson (1978) ascribed a central role to the belief systems of the dominant coalition. Building on his early work, Lenz (1980) provided a model of adaptation where the cognitive maps of the dominant coalition stand in circular relation to the environment, co-alignment of strategy and structure, and performance and the causal maps are seen as shaping the co-alignment. At a similar time, Stubbart (1989) asserted that research on managerial and organisational cognition provides a crucial missing link between environmental conditions and strategic action. Porac and Thomas (1990)

highlight the link between cognition and an organisations environment and wrote that from a cognitive perspective, decision makers act on a mental model of the environment. Therefore any explanation for strategic responses to competitive pressures must ultimately take into consideration the mental models of competitive strategists. Meindl *et. al.* (1996 p.xx) wrote in the introduction to 'Cognition Within and Between Organizations' that there "...is some relationship between the way managers and organizations think and important organizational outcomes..." and these authors continue, "...there is also strong reasons based on anecdotal evidence for believing that the way managers conceptualise and understand their business environment is important for what organizations do and how they perform" (p.xix).

Therefore, attention was being paid to research into the psychology of strategic management at least since the 1970s. Although it is still considered a newly emerging field of study, it has shown considerable development to now becoming an established research area with a recent "upsurge of interest" (Hodgkinson and Sparrow, 2002 p.8). Hodgkinson and Sparrow (2002 p.3) write "...cognitive competence is crucial to strategic responsiveness and the organization's capacity to learn and renew itself in these turbulent times", and argue that OL is the essence of strategic competence (p.32). They continue, "Strategic competence requires the formation of rich cognitive maps, which in turn require (and enable) high levels of responsiveness to the external environment" (p.301).

The links presented so far between an organisation's environment and organisational action are presented in Figure 4.1:

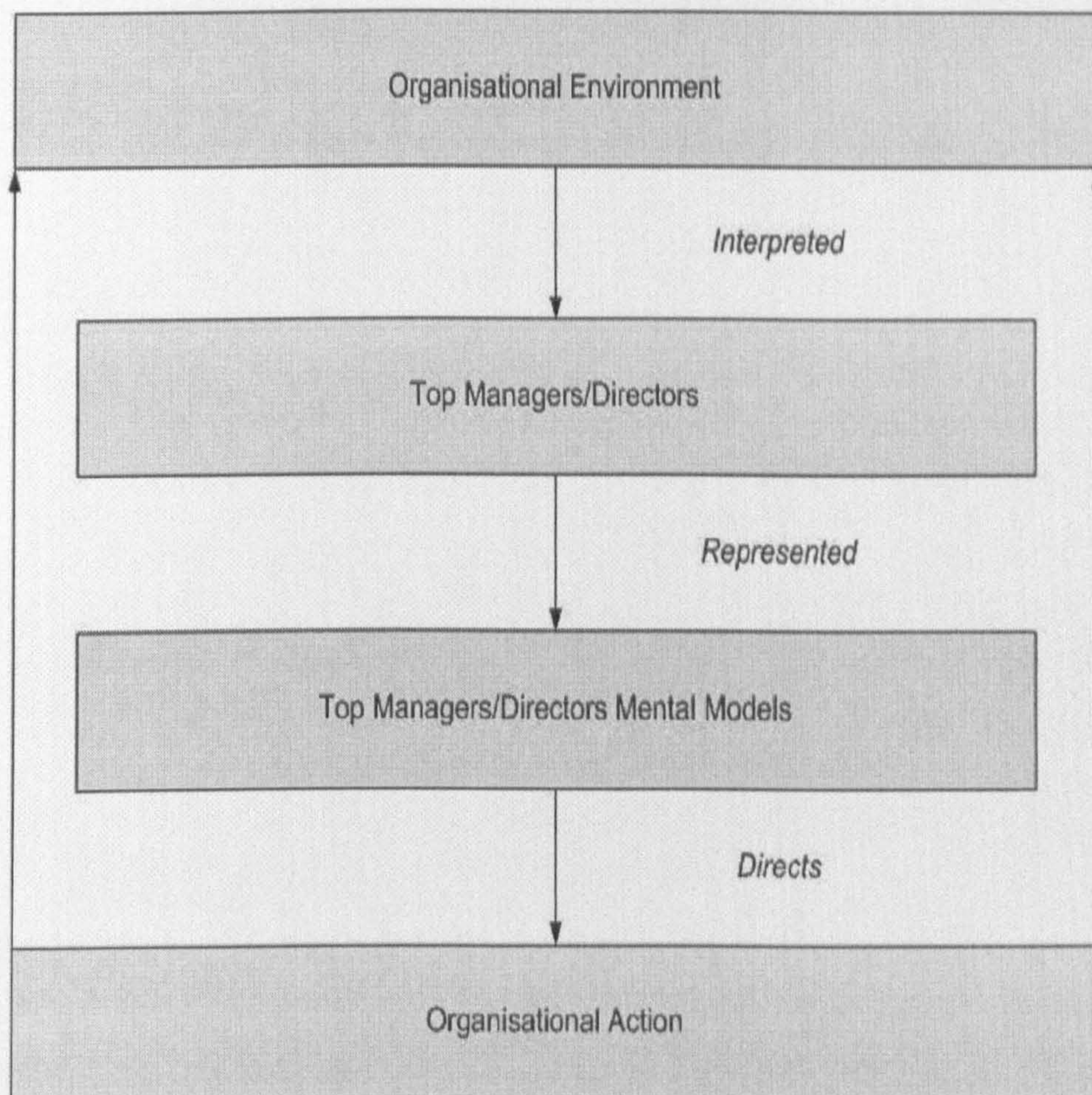


Figure 4.1: The Links from an Organisations Environment to Organisational Action

4.6 THE ORGANISATIONAL LEARNING AND ORGANISATIONAL PERFORMANCE RELATIONSHIP

Explicating the OL/organisational performance relationship so far has demonstrated the importance of the environment as a trigger for learning and the crucial role of top management decision makers who interpret the environment and act based on their mental models. Empirical research linking environmental perception to cognitive processes suggests that to be successful, firms should not only recognise new environmental events, but also understand how the events influence the organisation and what actions are needed to respond to that environment (Barr and Huff, 1997). OL processes (*e.g.* sharing, negotiating and validating information and knowledge) help

organisations develop a better understanding of environmental events and their impact on the organisation. Such understanding enables the organisation to formulate and implement effective strategies. The role of OL is to develop a shared understanding of environmental forces and their impact on the organisation, rather than simply reacting to an external stimulus, that allows the organisation to take purposeful actions (Gynawali and Stewart, 2003). OL prevents organisations from reacting to environmental opportunities or threats (both external and internal) in an uncoordinated, individualistic, 'knee-jerk' manner. Rather the OL process ensures individual interpretations are shared to result in a consensus on which coordinated action can follow.

Consider the following example; Fleck (1935) in his studies of the Wassermann test for syphilis, argued that the disease was undefined for 400 years in part because there were no means for collective action. He noted that different groups such as astrologers, priests, pharmacists, and physicians operated with their own theories and it was only public pressure for a blood test that caused Wasserman to gather the collective experiences necessary to develop a test (Dougherty, 1992). In an organisational context, Lopez *et. al.* (2005 p.229) notes that "Organizational learning is not simply about whether individuals have learned something new (Huber, 1991), or whether the organization is skilled at developing new products (Nonaka and Takeuchi, 1995); it needs to be applied to a strategic context (Crossan *et. al.*, 1999). To avoid uncoordinated action, individuals in an organization must share some common knowledge structure that will result in each individual taking actions that will collectively achieve strategic objectives (Mezias *et. al.*, 2001)". As Corner *et. al* (1996 p.159) state, "Organizational level outcomes are the consequences of collective action" .

An example of the need for OL to produce a shared understanding of the environment and elicit united action is exemplified in the case of Intel (Gynawali and Stewart, 2003 p.72):

...because the increased demand for low-priced PCs was a unique environmental event and many perspectives existed about what it meant for Intel and how it should react to the event, Andy Grove (former CEO of Intel) said that a lot of internal confusion reigned due to the equivocality in the environment (Grove, 1996). Because of the equivocality, it took several months of discussion and debate before Intel realised that the event would have an important impact on the firm and that it needed to come up with its own low-priced microprocessor. Grove goes on to describe how this internal dialogue eventually led to a new understanding of the industry and Intel's position in it

The role of OL is to promote individual diversity, yet formulate shared consensus. OL is not simply the sum of the learning of its employees, therefore, organisational capabilities are not embedded in any single person but in the links across diverse individual capabilities. Learning in organisations entails not only the acquisition of diverse information, but the ability to share common understanding so as to exploit it. The apparent paradox is that collective learning, by definition, “encompasses both divergence and convergence of the meanings that people assign to their surroundings” (Fiol, 1996 p.176). OL, like individual learning, involves the development of new and diverse interpretations of events and situations. Unlike individual learning, however, collective learning also involves developing enough consensus around those diverse interpretations for organised action to result. Fiol (1996 p.174) cites the following example:

In late 1984, a mid-level manager of a Fortune 100 financial services firm introduced Project X as a new-venture idea during a seminar at corporate headquarters. The venture represented a significant departure from the company's business. Despite widespread resistance to the idea, the division's CEO appointed an 11-member venturing team to analyze the feasibility of the project. The team was torn by conflicts during early stages of the two-year venture development process that ensued. Even those on the team that opposed the idea did not agree about their reasons for resistance. Ultimately, after extensive conflict and negotiations, the project X team unanimously supported the venture and successfully managed its implementation. Interviews with team

members indicated that the powerful elite did not 'force' a consensus. The composition of the new-venture team remained the same. The venture concept was recast a number of times, but emerged at the end of the process almost identical to the idea that was initially proposed by its champion. What appeared to have changed was not the ultimate definition of the venture, nor its relationship to the environment, nor the people involved with the venture, but rather the cognitive frames of reference through which people understood the venture. The Project X team learned as a group: They converged around an innovative idea that required a fundamental shift in their collective understanding to be successfully implemented.

The claim is that based on the results of this study, the convergence around a broad frame of interpretations provided the common understanding needed to move toward collective action despite the persistence of the divergent content of interpretations. Further, Boland *et. al.* (1996) recognise that coordinated outcomes emerge in organisations when individuals think and act in ways that take others in the organisation and their interdependencies into account. According to Boland *et. al.* (1996), distributed cognition is the process whereby individuals who act autonomously within a decision domain make interpretations of their situation and exchange these interpretations with others whom they have interdependencies so that each may act with an understanding of their own situation and that of others. When distributed cognition works well, the managers' individual actions take each other and their interdependencies into account in a way that yields a coordinated outcome. Dougherty (1992), for example, found that successful product innovators were distinguished from unsuccessful ones in that they created collaborative mechanisms that encouraged appreciation of each other's perspectives and their mutual interdependencies. To achieve distributed cognition requires a process of surfacing and examining individual understandings.

The argument that OL not only aids an organisation in the development of a more robust understanding of the environment but also allows for coordinated action to follow can be added to complete the steps from an organisations environment to

organisational performance (see Figure 4.2). The diagram only includes the top manager and departmental manager levels and the reasons are two-fold. Firstly, it will be at this level where the strategic decisions are made and implemented and hence an important focus for the existence of shared understandings. Secondly, for simplicity as large organisations will have any number of organisational levels. However, the arguments for shared understandings being important for organisational performance improvement hold across all levels of an organisation.

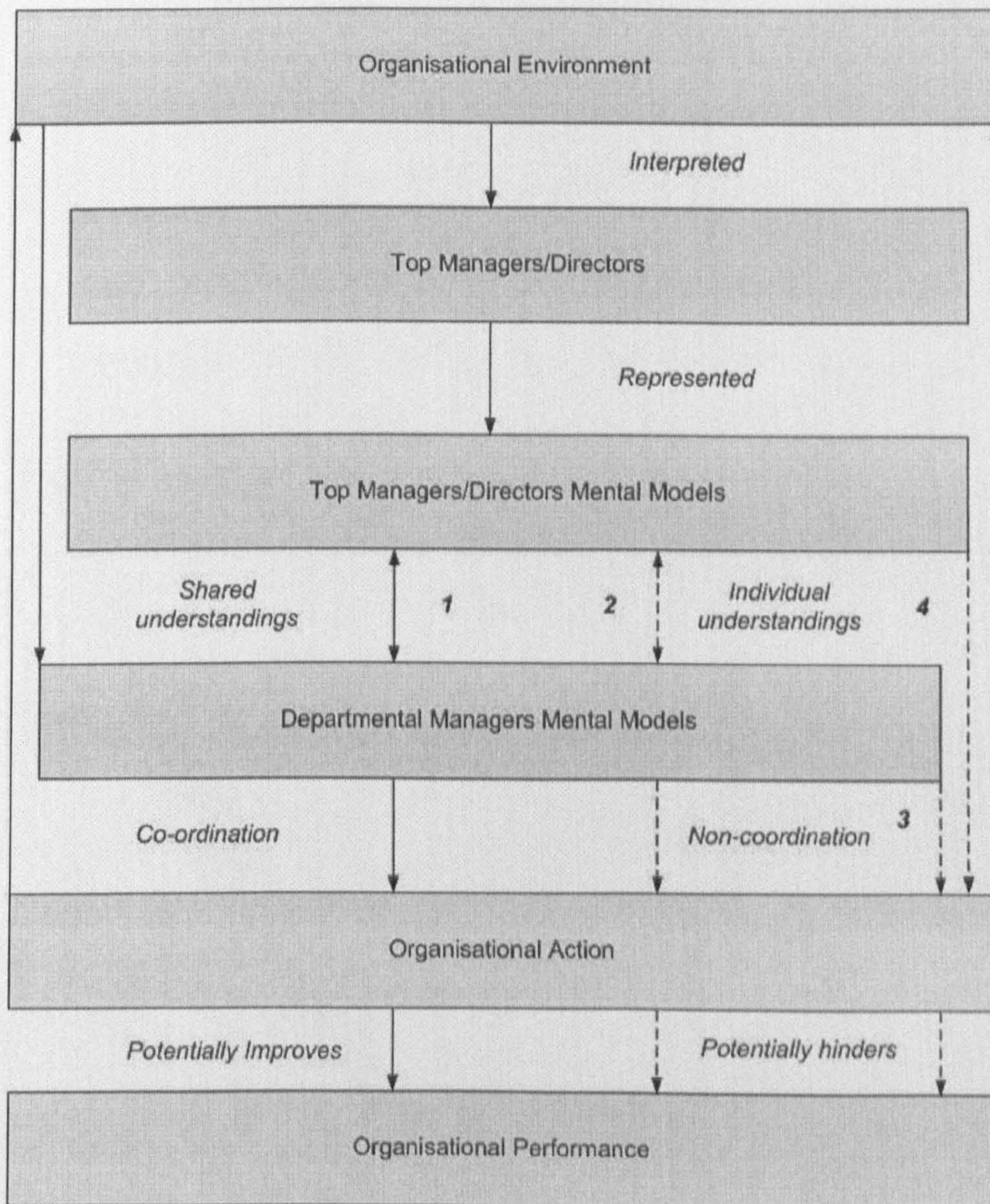


Figure 4.2: The Steps from an Organisations Environment to Potentially Improved Organisational Performance

The diagram explains the rationale for how OL can potentially improve organisational performance. Starting from the top, the strategy literature predominantly recognises the influence of an organisations external environment on the performance of the organisation. It is the top managers who are primarily responsible for interpreting the environment, and top managers do so by the use of mental models. Following pathway 1, as the top managers make these mental models explicit to the departmental managers who are responsible for implementing the environmental alignment strategies, the departmental managers learn how the organisation is to respond. The departmental managers then articulate their mental models which will inform the top managers of how they view the strategy, reveal their understandings of the external environment, and importantly, will provide further knowledge of their operative domain and hence the firm's capacity to implement the proposed strategies. Based upon this, individual mental models change to accommodate the new ideas and a shared understanding between the top managers and departmental managers develops. Implementing the strategy based upon these shared understandings of what the firm must do to align with the environment and succeed is likely to result in co-ordinated action that may result in an improvement in organisational performance.

Alternative to this process, there are three other potential possibilities. Following pathway 2 the mental models of the top managers are articulated, but the departmental managers, for whatever reasons, don't alter their mental models to incorporate the strategy, or alternatively, the top manager does not alter his/her mental models to take into account the departmental managers' input. Reasons could include, for example, the top managers act authoritatively and do not seek the departmental managers input, departmental manager resistance to the strategy, departmental manager resistance to the top manager, or misunderstanding of the top manager. The result is a shared

understanding does not develop and when the strategy is implemented a greater likelihood of non-coordinated action occurs in comparison to pathway 1. The other two potential pathways are pathway 3 where the departmental managers may act without any direct instructions from the top managers, and pathway 4 where the top managers may implement strategies without any consultation with the departmental managers. Both of these pathways are again more likely to lead to non-coordination in comparison to pathway 1.

Importantly, the model recognises that there is only the potential for positive organisational performance improvement as although this is argued to be more likely if pathway 1 is followed, there are a number of variables that could mediate this relationship and these are considered in section 4.8.

4.7 A MODEL OF THE PROCESS OF ORGANISATIONAL LEARNING AND ITS VALUE FOR ORGANISATIONAL PERFORMANCE

The preceding sections rationale argues that OL processes facilitate organisational performance through the development of a broader understanding of the firm's external and internal environment and the consequent development of a shared vision which in turn provides the basis for unified action. Conversely, if individual learning was not translated into shared mental models, a narrow perception of the environment and non-coordinated organisational action is more likely. Essentially, if the mental models of managers within an organisation are largely idiosyncratic, it will be difficult to formulate and implement coherent strategies. As Van der Heijden and Eden (1998 p.62) state, "Without any consensus or shared meaning, individual actions will not cohere and the organization will fragment and, if left in this stage, ultimately go under". Similarly, Spector and Davidsen (2006 p.66) state, "In an effective learning

organisation, the mental models of the individuals in the organisation are expected to converge and result in a shared vision, expressed in the form of common goals and preferences. This shared vision should arise from the recognition of a common reality and constraints shared by members of the organisation. Manifestations of such a convergence are indicators of effective OL”.

Figure 4.3 combines the justification of the developed OL model with the link to potentially improved organisational performance.

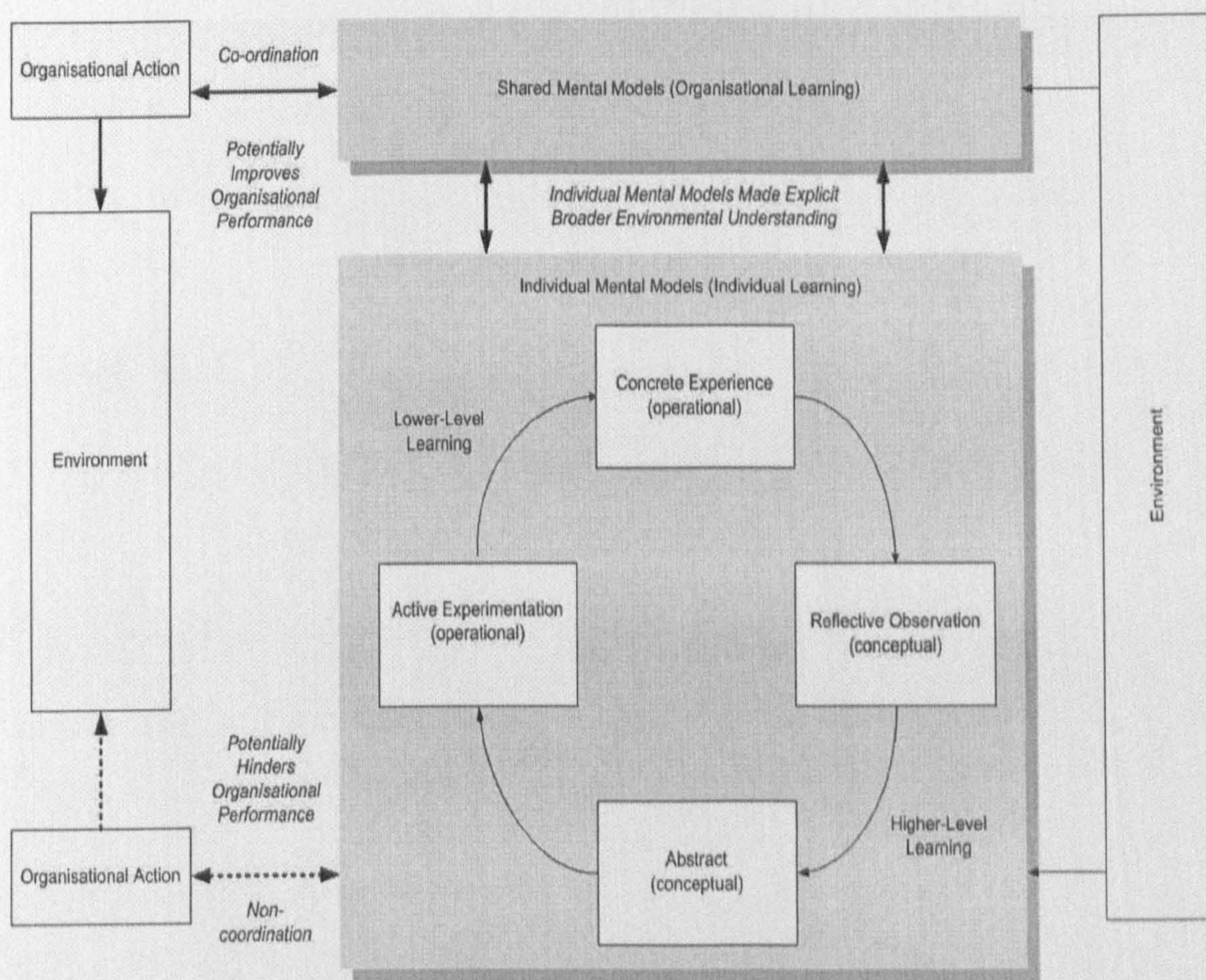


Figure 4.3: A Model of the Process of Organisational Learning and its Value for Organisational Performance

Figure 4.3 demonstrates that as an organisation competes within its environment over time, individual mental models develop and change in response to how competitive

advantage can be best achieved. Some of the individual mental models will be translated directly into action, whereas others will be made explicit, shared and negotiated, and may form shared mental models that are a collective understanding of the various factors in the internal and external (predominantly interpreted by top managers) organisational environment and decisions that must be made to best compete. Organisational action resulting from shared mental models is more likely to derive from a broader understanding of the firm's environment and result in coordinated action in comparison to organisational action based upon individual mental models.

4.8 INFLUENCES ON THE EFFECTIVENESS OF ORGANISATIONAL LEARNING IN FACILITATING ORGANISATIONAL PERFORMANCE IMPROVEMENT

The preceding section outlines the justification for the value of OL and potential to improve organisational performance. The proposition was that OL can potentially lead to improved organisational performance, rather than will lead to increase organisational performance, because researchers have drawn attention to a number of factors which may influence the effectiveness, both positively and negatively, of OL. By their very nature, as a mental model embodies a simplification of an individual's view of the world, mental models must also limit an individual's view of the world. Walsh (1988) recognised previous research in the field and indicated that mental models can limit a manager's ability to understand an information domain. These simplified representations mean a manager often must act on "impoverished views of the word" (Weick, 1979 p.68). Walsh (1988) concluded that for the past 30 years management scholars have been pessimistic about managers' abilities to process information effectively and there was evidence to support this claim. Starbuck and colleagues cite oversimplified mental models regarding environmental events to be a major

Organisational Learning and the Link to Organisational Performance

contributory cause of organisational decline and failure (e.g. Starbuck and Hedberg, 1977; Starbuck and Milliken, 1988). Bartunek *et. al.* (1983 p.273) argued that in complex information environments a narrow framework for understanding often results in ineffective management behaviour. Similarly, in a discussion of managerial world views, Miller (1993 p.131) reasoned that simplicity over long periods of time will eventually lead to lower organisational performance (Walsh, 1995).

As well as the potential problems of narrow mental models, mental models may also be strongly held. Very cohesive mental models may lead managers to overlook important environmental changes so that appropriate organisational action is not taken (Hall, 1976, 1984). Once formed mental models can serve to filter new information in such a way that individuals and groups become impervious to the need for strategic change, thereby undermining their adaptive capacities, a concept known as cognitive inertia (Hodgkinson and Sparrow 2002). Hodgkinson and Sparrow (2002) make particular reference to the strength of shared mental models and note that strategists may become overly dependent on the prevailing shared mental model so that dramatic changes to the competitive landscape may go undetected (or unheeded) until successful adaptation is no longer possible. Left unchecked, such inertia can threaten the adaptive capabilities of the firm to the point of extinction. Barr *et. al.* (1992) argue that the persistence of mental models that are no longer appropriate would explain why organisational decline is often a 'downward spiral' despite an abundance of managerial talent and cues of trouble. Consequently, the proposal was that organisational renewal requires managers to change their mental models in response to environmental changes and that delays in this process will be associated with decline. Indeed, a common theme in the literature is cognitive inertia often causing mental models to fail to change in a timely manner in response to a changing environment and that the resultant inaccurate

models are associated with deteriorating performance (Hedberg *et. al.*, 1976; Hedberg and Jonsson, 1977; Barr *et. al.*, 1992). Shared mental models may be more prone to cognitive inertia in comparison to individual mental models because modifications would require addition to, or alterations to, at least two individuals' mental models to result in a change in the shared mental model. However, Klimoski and Mohammed (1994) recognise that there are any number of factors that would affect the speed of shared mental model development and for example, obvious successes, may result in the development of a shared mental model at the same rate as individual mental model change. These authors also recognised that cohesive mental models may not always be a barrier to OL. Research indicated that members of cohesive groups are more likely than others to participate actively in conversations and engage in self-disclosure or collaborative narration (e.g. Owen, 1985). This increased communication may facilitate the development of shared mental models. Further, Klimoski and Mohammed (1994) recognise potential problems concerning a lack of cohesion and cite Langfield-Smith's (1992) study designed to elicit shared cognitive maps. Langfield-Smith's (1992) conclusion was that the experimental group was not cohesive enough to cultivate shared understandings. The implication was that cohesion may be an important antecedent of shared mental model development.

Groups that display a high level of cognitive cohesion are also likely to demonstrate a high level of cognitive consensus, or agreement, across the group. It has been argued that both cognitive consensus and cognitive diversity are important for OL to be effective (Fiol, 1996). However, Mohammed and Dumville (2001) note that extreme diversity and consensus in collective representations are generally viewed as dysfunctional. For example, multiple member perspectives have been shown to contribute to creative solutions, but may also cause problems due to miscommunication

and disorganisation (e.g. Jackson, 1992). Cognitive diversity can assist a group in operating as a unified structure, but becomes a liability when the uniqueness of individual contributions is lost. Hence, a delicate balance of both agreement and disagreement is required. The optimal level of consensus and diversity in framing perspectives that will contribute to effective organisational outcomes will depend upon a number of factors, including the specific environment in which the group operates, the level of interdependence among members, the nature of the task, and where the group is in the decision making process (Mohammed and Dumville, 2001).

Mental models will also determine what information will receive attention. Nisbett and Ross (1980) explain that individuals recall the elements or features of a stimulus situation that are most prominent in their mental models. Managers, therefore, can be expected to focus their attention on environmental changes that are most salient to, or offer support for, their current mental models, while other potentially important changes in the environment may not be recognised (Keiser and Sproull, 1982; Walsh, 1995). Just as mental maps selectively limit information attended to and similarly slant how this information is interpreted, existing mental maps may also limit the range of alternative solutions to the issues that have been identified (Bateman and Zeithamel, 1989). The conclusions of an empirical study by Fahey and Narayanan (1989) stated that the fit between cognitive structures and the environment was less than perfect and that the decision makers of the organisation both under-identified and over-identified certain environmental factors. Shipton (2006 p.245) states that those with the responsibility for establishing the strategic direction of the organisation do not necessarily learn effectively from the experiences and stimuli to which they are exposed (March, 1991). There is a natural tendency for senior managers to focus on efficiency gains, rather than to explore new solutions to emerging needs. According to this

argument, OL can become a self-limiting exercise, whereby decision-makers interpret stimuli or information to support, rather than to challenge, existing perspectives. Organisations may be myopic and attach too much importance to information from a particular situation, especially where it has involved past success (Levinthal & March 1993). Shipton (2006) also recognises 'superstitious learning' as being a situation whereby a firm incorrectly concludes that its own actions caused a valuable outcome and repeats that action which can lead to potentially disastrous outcomes for the organisation (Levitt & March, 1988). Mental models can also be inaccurate and this inaccuracy can either increase or decrease as environments change and understandings are modified. Huber (1991) states that organisations, like individuals, can learn the right things incorrectly or they can learn the wrong things correctly.

The implications for OL is that organisational performance improvement will not automatically occur as a result of a coherent shared understanding developing. However, the crux of the OL process described in the previous chapter is that it is a dynamic process of sharing, negotiation and validation that challenges existing cognitions. The process relies on the development of rich cognitive maps and a realisation that although OL relies on consensus for organised action to result, it also relies on individual divergence in terms of developing new and varied interpretations of events and situations (Fiol, 1996). If this diversity is not promoted, then the problems such as narrow mental models, cognitive inertia, and selectively limiting information to support existing mental models may occur.

It is important to note that the rationale of the OL model requires individual mental models to be made explicit for OL to occur. However, organisations can exist and compete in vastly different internal and external environments, for example, strategies, systems, structure, culture, power and emotion are only a few organisational

differences which may affect whether individuals want to, are able to, or have the opportunity to express themselves. The difficulties associated with this process were recognised in a previous chapter (3.11) and are further acknowledged by Hayes and Allinson (1998) who suggest that the process of collective learning as the joint construction of meaning through sharing and dialogue is rarely problem free. Ideology can distort the free flow of meaning and sharing can also be impaired by communication problems related to structural and cultural factors, by political behaviour and the suppression of information for personal or group advantage, and by the lack of opportunity for sharing and dialogue. The learning organisation literature predominantly seeks to analyse these antecedents and provide recommendations for effective OL (e.g. Pedler *et. al.*, 1991; Garvin, 1993; Watkins and Marsick, 1993). However, as Friedman *et. al.* (2005) pointed out, transferring learning to effect organisational level change is enormously complicated, depending upon individual, job and structural characteristics, as well as the existing learning culture and reward/ recognition systems. It is not the focus, nor within the scope, of this research to enable an extensive investigation of these antecedents. However, it is anticipated that an analysis of the results will provide indications of the factors influencing the value of OL and provide directions for further research.

4.9 PROPOSITION AND RESEARCH QUESTIONS

Proposition 4: OL processes facilitate organisational performance through the development of a broader understanding of the firm's external and internal environment and the consequent development of a shared vision which in turn provides the basis for unified action.

4.9.1 *Research Questions:*

6. As potentially improved organisational performance is dependent on the formation of a shared vision through OL processes, can the shared vision be represented and measured and hence, OL linked to potentially improved organisational performance?
7. Does OL lead to potentially improved organisational performance in comparison to individual learning?
8. Should organisations foster OL processes or concentrate on individual learning?

4.10 SUMMARY

The main emphasis of OL is that there are associated benefits for the organisation and frequently these benefits are related to performance outcomes leading to competitive advantage. OL has been considered one of the fundamental sources of competitive advantage within the context of strategic management (Lopez *et. al.*, 2005) with the reasoning behind such claims relating to organisational change and the importance of environmental fit.

It was noted that organisations are facing unprecedented levels of change and remaining competitive was a continual process for the majority of organisations. A key premise of strategic management is that there must be a fit between an organisation and its environment to remain competitive and survive over the long term and it was proposed that OL is crucial in attaining this alignment. OL processes help organisations gain a broader understanding of both the external and internal environments in comparison to individual learning that is not shared. The result of the OL process is the creation of a shared vision on how the organisation can compete and coordinated action which can be drawn from this.

Adding these propositions to the OL model gave a researchable OL/organisational performance model to meet the aim of empirically studying the process of organisational learning and evaluate the value for organisational performance improvement.

The chapter concluded with a cautionary note that OL does not automatically mean improved performance and notes a number of influences on the effectiveness of OL.

CHAPTER 5

5. Research Design

5.1 INTRODUCTION

The purpose of the chapter is to outline the research design which, at this point in time, is unique in OL research. The chapter begins by identifying the philosophy of the research as being firmly grounded in positivism, although the use of mixed methods is the most appropriate to meeting the aim of the research. The propositions and research questions are restated and subsequently, the methodology is presented that utilises cognitive mapping to research the process and value of OL.

5.2 RESEARCH PHILOSOPHY

Within research, the two major research paradigms are positivist, representing the quantitative research methodology, and interpretivist the qualitative research methodology. This research is firmly positioned within the positivist philosophy and associated quantitative framework, where data form the basis through which certain preconceived theoretical ideas or hypotheses are confirmed known as the deductive research approach. Smith (1998) states that positivism is, perhaps, the most important attempt to generate authoritative knowledge about the social world and Hughes and Sharrock (1997) recognised positivism as the philosophical epistemology that holds intellectual sway within the domain of social research methods. In the context of OL, Kim (2003 p.9) writes "...in many cases, the taxonomy of positivistic research should be employed as the central methodological framework in investigating organisational learning and subsequent performance issues while valuing contributions made by the two other [interpretivism and critical science] approaches to organisational learning

research". The introductory section of this research outlined the fragmented nature of the OL field and argued that scientific methods are particularly required to test and validate theory. Emulating the natural sciences and the desired outcomes of explanation, prediction and generalisation was the goal of this study.

By contrast, within the qualitative framework the data comes first followed by theory or explanation. This is known as the inductive research approach (Carr, 2000). Cohen and Manion (1980 p.28) summarise the characteristics of the data used by the two research paradigms:

Data gathered by the normative researchers may be described as objective, external, quantifiable, explanatory, publicly verifiable and replicable. Interpretive data by contrast, may be referred to as subjective, internal, qualitative, interpretative, unique and negotiable.

Interpretive researchers are involved by design and intent in the social reality under investigation. They repudiate neutrality, recognising that their participation in the situation under investigation will have an impact both on them and on the events of which they are part. It is this very involvement that yields the insights the researcher's desire. They seek modes of explanation from within the data (Carr, 2000). Telford (1996 p.31) summarises the purpose of qualitative research as:

...to work from the setting in which the enquiry is being made so that the depth of complexities surrounding the topic... can be uncovered and linked appropriately to the findings; that is, a holistic understanding can be gained.

However, it is the very contextual and subjective nature of interpretative research that can be an impediment for OL researchers who seek generalisability and reliability in findings. Kim (2003) also highlights the issue of personal subjectivity inherently biasing the research conclusions.

The philosophical basis of this research is grounded in positivism, however, the proposed research does require tapping tacit knowledge and representing this explicitly.

This requires the use of both qualitative and quantitative methods so that each can supplement the other in order to generate more sufficient and meaningful data. By utilising different procedures greater depth is given to the data and this will increase the researcher's understanding (Croll, 1986).

It is important to note that debate surrounds the usefulness of mixed methodologies because of the fundamental differences between the perspectives. The positivist frame of reference assumes a fixed social reality that remains basically unchanged regardless of the researcher's investigative stance. For the interpretivist "social reality is not some 'thing' that may be interpreted in different ways; it is those interpretations" (Blaikie, 1991 p.120). Therefore, as Guba and Lincoln (1989 p.240) note:

... triangulation itself carries too positivist an implication, to wit, that there exist unchanging phenomena so that triangulation can logically be a check. And if one takes the position that there is a reality 'out there' separate from ourselves which, however, cannot be known but only hinted at through our constructions, then it is difficult to see how any amount of triangulation (as conceived in the social sciences) can get us any 'closer' to knowledge of that reality.

It is clear that if a researcher were to reject the notion of a fixed social reality, then the idea of there being a method that could help the researcher pinpoint a social reality would make no sense. These fundamental differences have an influence on perceptions of validity, reliability and hence bias. For example, the universal validity of a claim may be deemed biased as some will believe their character reflects the social location of the researcher.

Hammersley (1992) writes:

...selection among these positions ought often to depend on the purposes and circumstances of the research, rather than being derived from methodological or philosophical commitments. This is because there are trade-offs involved. For instance if we seek greater precision we are likely to sacrifice some breadth of description: and vice versa. And the costs and benefits of various trade-off positions will vary according to the particular goals and circumstances of the research being pursued.

Consequently, the researcher recognised that choosing one position over the other involves trade-offs. Further, the choice of methods strongly correlate to the aims and purpose of the research, rather than being solely bound by a philosophical or methodological perspective.

5.3 RESTATEMENT OF PROPOSITIONS AND RESEARCH QUESTIONS

Proposition 1: The basis of organisational learning is individual experiential learning.

As individuals learn experientially their mental models, which determine potential action, develop and adjust.

Research Question:

1. By analysing individual experiential learning what insights can be gained into the OL process?

Proposition 2: Individuals may undertake lower-level learning to guide the everyday operation of the organisation or higher-level learning to create new understandings and contribute to long term organisational success.

Research Question:

2. Can higher-order and lower-order learning be identified and categorised in organisations?

Proposition 3: As individuals learn experientially their mental models develop and adjust. In an organisational context, as these mental models are made explicit in groups of three or more, and processes such as negotiation and argument may ensue, shared mental models develop. Over time, as long as any resultant action will affect the organisation, change in the shared mental model constitutes organisational learning.

Research Questions:

3. As organisational learning occurs through individual experiential learning, is it possible to represent OL by amalgamating common components of individual mental models?
4. By analysing individual learning over time, can OL be measured?
5. Can these OL representations and measurements be deconstructed to analyse the formation and development, and hence process, of OL?

Proposition 4: OL processes facilitate organisational performance through the development of a broader understanding of the firm's external and internal environment and the consequent development of a shared vision which in turn provides the basis for unified action

Research Questions:

6. As potentially improved organisational performance is dependent on the formation of a shared vision through OL processes, can the shared vision be represented and measured and hence, OL linked to potentially improved organisational performance?
7. Does OL lead to potentially improved organisational performance in comparison to individual learning?
8. Should organisations foster OL processes or concentrate on individual learning?

5.4 METHODOLOGY

Empirical research into organisational learning has been regarded as problematic and there are a number of methodological issues (Easterby-Smith *et al.*, 2000).

Firstly, the scope of organisational learning studies can prove difficult. To empirically capture the knowledge shared by all individuals of an organisation is only realistically possible for the smallest organisations. However, it has been established that this is not necessary as OL can occur in groups of three or more individuals. Consequently, the approach adopted here is to examine the changes in the mental models of management teams, an approach supported by Gynawali and Stewart (2003). Management teams are utilised as they are likely to have more strategic mental models than those closer to the 'shop floor' who are likely to be more operationally oriented. Further, it is the management teams who are predominantly responsible for implementing and directing organisational action.

Secondly, by their very nature, mental models are inherently individual and complex and so the choice and validity of the mental model representation tool is important. Therefore, the following section will outline how it is possible to represent mental models explicitly.

5.4.1 Representing Mental Models

Initially, it is necessary to make the distinction between mental models - knowledge that is within individuals' heads - and mental model representations which are explicit representations of these models - mental model maps. Making mental models explicit requires tools with which to capture and communicate them, and various methods have been advanced. Different methods have strengths in some domains and weaknesses in others. The following aims to briefly outline and evaluate the mental model mapping methods available to be able to identify the most appropriate for the purposes of this research.

OL has been conceptualised for this study in terms of cognitive change and so techniques that are used for mapping managerial and organisational cognition can be utilised for identifying and charting OL. Managerial and organisational cognition research must conceptualise what exists or goes on in human minds at individual, group or organisational level of analysis (Laukkanen, 1990). The obvious difficulty is that such phenomena are not directly observable. Their study builds on what can be experienced, for example as oral communication, and representation tools are needed to model the unseen cognitive structures and / or processes. They help capture and analyse the information embedded in raw data about the substance assumed to hide in the subjects' minds. Although difficult, there is nothing unusual about attempts to capture the content of human minds. Everyday we infer people's thinking, beliefs or knowledge and inform others of our thoughts, predominantly using language. Further, we rarely doubt the validity of such epistemological operations (Evans, 1988; Hogarth, 1980). However, in managerial and organisational cognition studies, empirical methods are needed that are more rigorous to provide a deeper explication of the mind. A now established method to achieve this is cognitive mapping (Laukkanen, 1992).

5.4.2 *Cognitive Mapping*

Mohammed *et. al.* (2000 p.132) provide an introduction:

...cognitive mapping is used extensively by researchers in organisational behaviour, strategic management, and political science. It was one of the first cognitive measurement techniques to be introduced into management research (Stubbart and Ramaprasad, 1990) and has been used to study decision making, negotiation, organisational cognition, and strategy (Bonham, 1993; Bougon et. al. 1977; Eden et. al. 1981; Stubbart, 1989). Cognitive mapping has generated enthusiasm as a methodological tool because it provides a way of accessing large, untapped sources of data generated by organisations (Huff and Fletcher, 1990) and examines meaning as a relational phenomenon (Bougon, 1983).

Weick and Bougon (1986 p.102) highlight the importance of cognitive maps when they state that, “Organisations exist largely in the mind, and their existence takes the form of cognitive maps”. Cognitive mapping is particularly suitable as a knowledge representation technique for several reasons. Firstly, cognitive maps were one of the earliest cognitive frameworks introduced into management research (Maruyama, 1963). Secondly, their features have been worked out in enough detail so that they can be represented by formal mathematical symbols and operations and finally, they have an established pedigree in management and strategy research (Huff, 1990).

Cognitive mapping methodologies are representations of both the content and structure of individuals’ idiosyncratic belief systems in a particular domain (Axelrod, 1976; Fiol and Huff, 1992). Because concepts can be linked by various types of relations (*e.g.* contiguity, proximity, continuity, resemblance, implication, causality), different types of maps exist (Huff, 1990; Fiol and Huff, 1992; Bougon, 1992). However, one form of cognitive map used frequently in the organisational literature is a cause map, which represents the causal links between concepts in the following way: ‘concept A has consequences for or can be explained by concept B’ (Eden *et al.*, 1981 p.40). According to Gray *et al.* (1985 p.85) “causality is conceptually and instrumentally the most potent of all relations” (Mohammed *et al.*, 2000).

Further reason for utilising a causal cognitive mapping technique in this research rests on the work of Bood (1998). This author explored four cognitive mapping techniques that are used in OL research: content analysis, repertory grid combined with multidimensional scaling (RGT-MDS), cause mapping with Laukkanen’s CMAP2, and cognitive mapping with Eden’s COPE (now known as Decision Explorer). Bood (1998) analysed the techniques according to important differences between methods regarding the signs considered as evidence of OL taking place. These signs reflect significant

changes on four different (partially overlapping) levels of analysis. First, changes in the words used by respondents may be signs of learning by the respondents. Content analysis in particular is able to detect such changes. Second, changes in identified underlying dimensions or concepts may be indications of learning occurring. Following Barr *et. al.* (1992) these changes may include the use of a new concept or the deletion of an old one, replacement of a specific concept by a more general term or the sustained use of new variables. Both the Repertory Grid Technique and content analysis combined with a multivariate statistical technique are useful for identifying such changes. Third, changes in the linkages between concepts may be signs of learning taking place. This may involve changes in the way in which concepts are linked, changes in the clustering or centrality of concepts, as well as changes in the causality between concepts. In particular, both COPE and CMAP2 have facilities that enable identification of such changes. Fourth, changes in the way in which concepts are used may be indications of learning. This entails, among other things, changes in the way elements are ranked along an underlying dimension or constructs are used to judge elements. Increasing dispersion of elements along a certain dimension, that is a dimension increasingly discriminating between elements, is a sign of such changes.

After exploring these methods, Bood (1998) claimed that they each had their own characteristic facilities, possibilities and limitations. The recommendation that follows was to choose a technique (or techniques) that correspond to the goals of the research project and availability of certain kinds of data. Explicit in this research is the need to compare individual and shared maps measured in time. Content analysis and RGT-MDS both have means of comparing only the content of maps, CMAP2 compares both content and structure, whilst comparison of cognitive maps using COPE is not a simple procedure (Bood, 1998). Laukkanen (1998 p.171) adds “if there are several

domains or issues and / or several persons or time points which must be analysed and compared, comparative causal mapping may be an increasingly useful descriptive and analytic technique". The CMAP2 analysis was an important contribution as it primarily addresses the complex issues of comparing maps and introduces the notion that maps designed for the purpose of direct comparison will be significantly different from those designed for idiosyncratic reflection (Jenkins, 1998). As Laukkanen (1994 p.322) writes, the comparative cause mapping method is specifically intended "for comparative analyses, for example, pinpointing the cognitive differences or similarities across organisational actors or for constructing and comparing groups, assumed cognitively homogeneous. Also, it is applicable for longitudinal studies or aggregated, e.g., industry-level, descriptions of management and organisational cognition". Therefore, It is argued that Laukkanen's (1994) CMAP2 method is the most appropriate for this research.

Validity is addressed in a later section, however, at this stage it is important to recognise that causal mapping techniques have been used extensively in management research and although empirical studies assessing causal mapping construct validity have been sparse, Billings and Hause (1989) found strong evidence to support the validity of causal judgements within cause maps generated from interviews, and Nicolini (1997) has also provided evidence of causal mapping validity (Mohammed *et al.*, 2000).

5.5 RELATING INDIVIDUAL AND ORGANISATIONAL LEARNING TO PERFORMANCE OUTCOMES

It has been noted that researching the relationship between OL and organisational performance has been regarded as being inadequately dealt with (*e.g.*

Yeo, 2002; Lopez *et. al.*, 2005) and problematic. This was primarily due to the fact that learning is difficult to measure exactly or to link directly to traditional performance indicators. Further, there are various levels and perspectives associated with organisational performance both formal and informal, financial and non-financial. It has also been recognised that improvements in performance are unlikely to be instantaneous and so difficult to relate to specific learning initiatives and may be due to more proximate factors such as changes in government regulations or in production or distribution costs (Crossan *et. al.*, 1995). To address these concerns, this research has stepped back from focusing on organisational performance measures. Chapter four highlighted the proposed benefits attributed to OL as emanating from the OL processes facilitating organisational performance through the development of a broader understanding of the business and its environment and the development of a shared vision which in turn provides the basis for unified action. The steps from an organisations environment to potentially improved organisational performance was presented in Figure 4.2 and is reproduced at this point (see Figure 5.1):

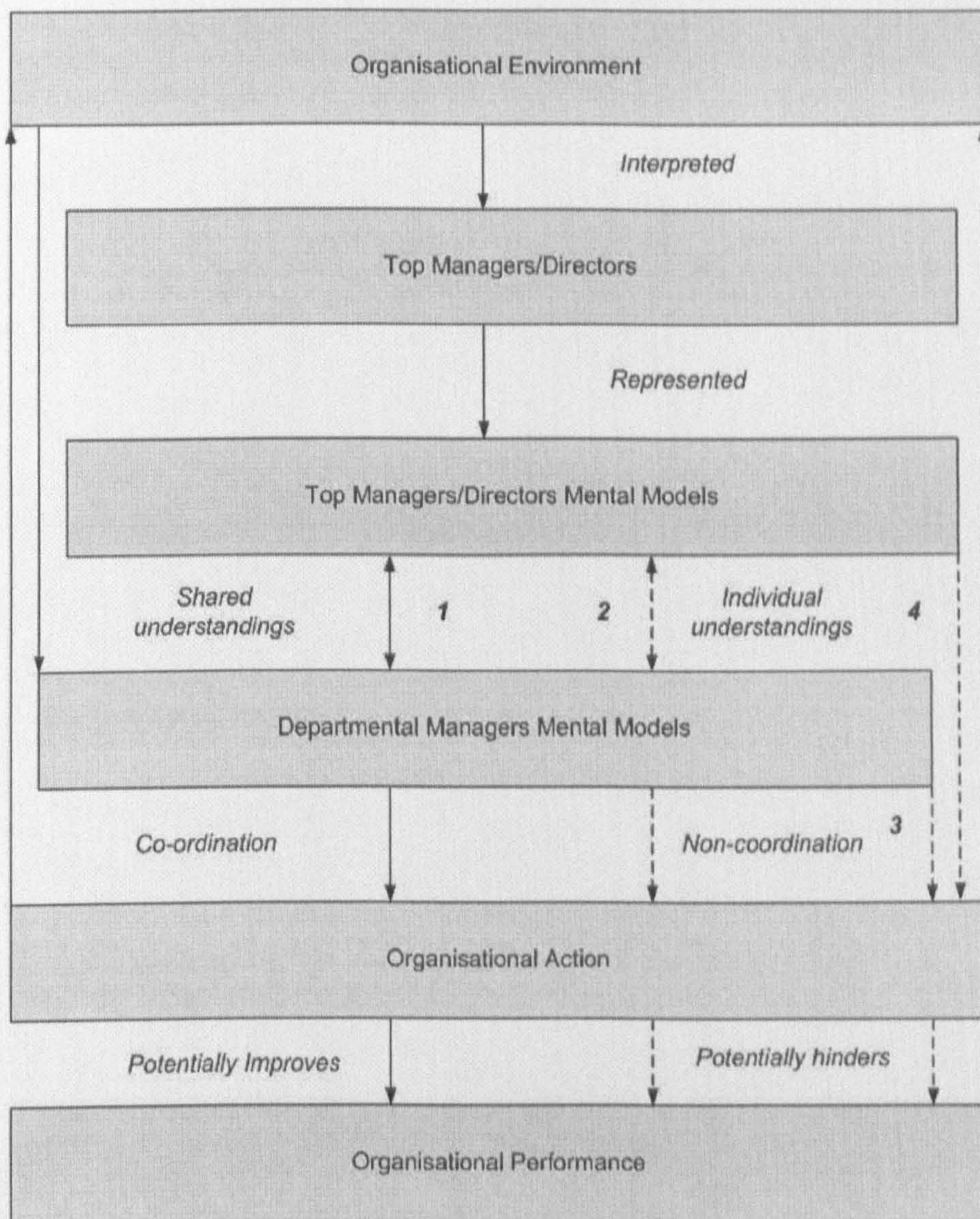


Figure 5.1: The Steps from an Organisations Environment to Potentially Improved Organisational Performance

Figure 5.1 illustrates that a broader understanding of the organisation's external and internal environments and the resultant likelihood of coordinated action and potentially improved performance occurs via pathway 1, whilst non-coordination and the potential to hinder organisational performance occurs via pathways 2,3, and 4 (see section 4.6 for a full explanation).

Although developing shared understandings are important across an organisation, a key point of comparison is between the top managers and departmental managers'

mental models as it is at this level where the strategic decisions will be made and implemented. The diagram demonstrates that developing shared understandings between the two levels is more likely to lead to coordinated organisational action and consequent performance improvement (pathway 1). The rationale of the OL/OP model proposes that OL will be more effective at developing these shared understandings because of the processes of sharing and validating concepts in comparison to individual learning which does not go through the same validation process (pathway 2) or even sharing of mental models (pathways 3 and 4). The OL/OP model is reproduced in figure 5.2:

A Model of the Process of OL and its Value for Organisational Performance

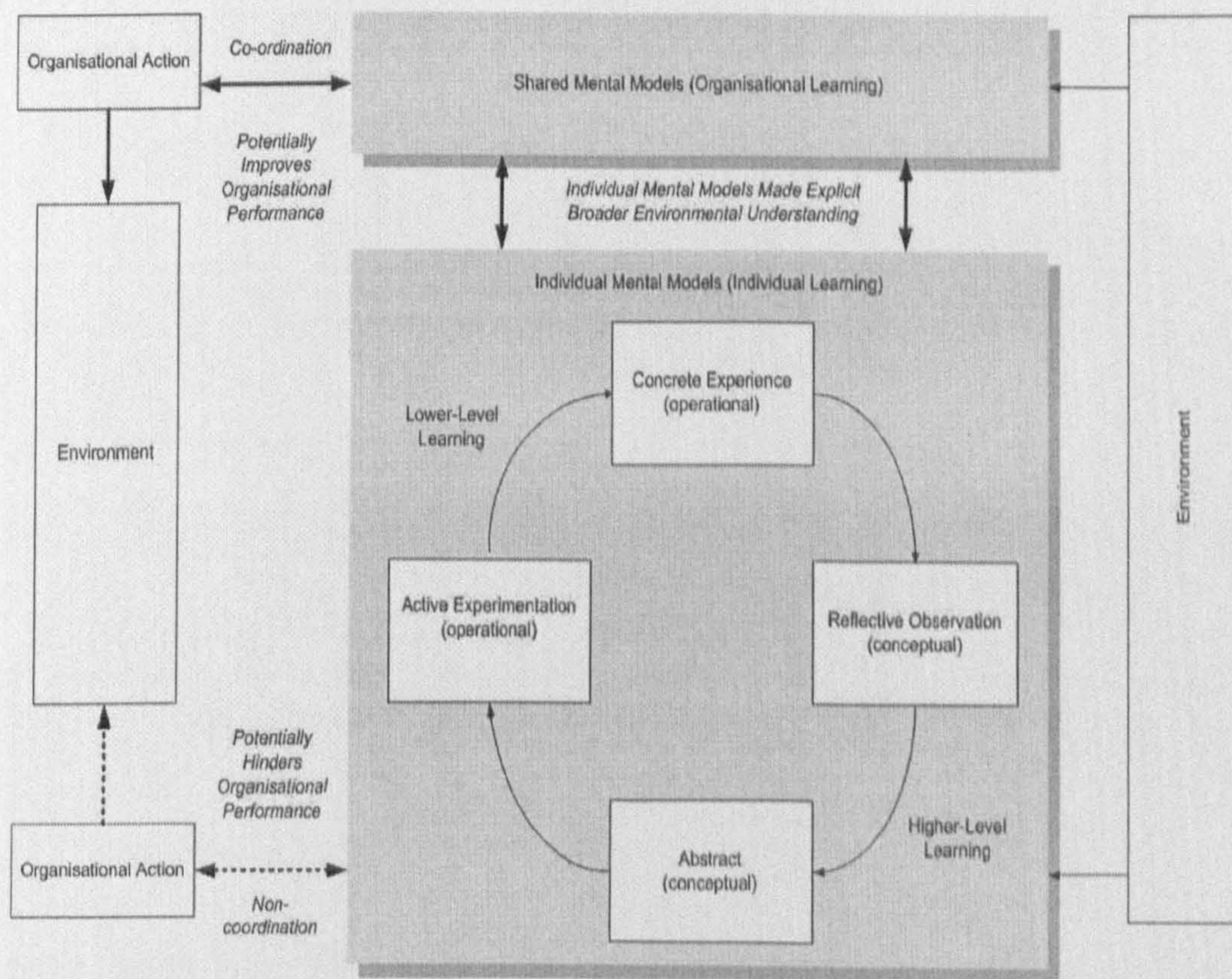


Figure 5.2: A Model of the Process of OL and its Value for Organisational Performance

Therefore, to assess the value of OL, the concept can be compared to individual learning. The learning of the individual departmental managers regarding organisational

Research Design

performance improvement can be analysed by representing the individual's mental model as a mental map (by utilising the CMAP2 method) at two points in time. Similarly, the mental model of the top manager is represented at the same two points in time. These maps are then compared to diagnose whether the maps have become more, or less, similar. OL can also be analysed by using the elicited maps from the departmental management team. By combining the mental map concepts that are common to the majority of the departmental managers, a shared mental map can be constructed at both points in time and the shared mental maps compared with the top manager's mental maps to identify whether the maps have become more, or less, similar. As OL has been defined as a change in the shared mental map, OL can now be evaluated against individual learning in terms of the effectiveness in attaining alignment between the departmental and top managers. The proposition was that OL processes can facilitate the development of shared understandings between the top and departmental managers to a greater extent than individual learning because of the processes of sharing and validating concepts. In turn, this leads to the likelihood of coordinated action and organisational performance improvement.

5.6 IDENTIFYING HIGHER AND LOWER LEVEL LEARNING

It has been highlighted that theorists predominantly recognise that higher levels of learning have the capacity to challenge or redefine mental models (Cope, 2003). Therefore, it can be reasonably argued that lower-level learning is likely to change a mental model (or models) in a small way (if at all) as information is processed that is a close repetition of what has been done before, whereas higher-level learning is likely to lead to a larger change in a mental model (or models) because this leads to new understandings. Consequently, the identification of learning levels may be evidenced as

individuals that display a small difference in mental maps over the period of the study correspond with lower-level learning whilst individuals that display large changes in mental maps over the course of the study correspond with higher-level learning. Just as individuals within an organisation can engage in different levels of learning, when they share this learning, the shared mental models that develop, and hence OL, can also be classified as lower or higher level depending on the amount of change of the shared mental map.

5.7 SUMMARY

The chapter began by evaluating alternative research philosophies and argued the most appropriate philosophical perspective to meet the aims of the research was positivism.

The focus for research into OL was deemed to be management teams as they direct and implement organisational actions under the direction of the top management whose role it is to interpret the environment and formulate appropriate organisational responses.

An important methodological aspect to this research is representing mental models. Following an analysis of the various methods the recommendation was to choose a technique that corresponds to the goals of the research project and availability of certain kinds of data. This research requires the comparison of individual and shared maps measured over time and Laukkanen's CMAP2 method was argued to be the most appropriate as it is specifically intended for comparative analysis. Causal cognitive mapping also focuses on action which is most relevant to this research as the learning / performance link rests on action.

To measure OL, it was noted that it has been proposed that individual and OL occurs as mental models change over time. By representing these mental models by causal cognitive mapping (using the CMAP2 method), individual learning can be charted. Organisational learning occurs when three or more individuals come together and make their individual mental models explicit, thereby constructing a shared mental model. This too can be represented by utilising the individual cause maps and including only those concepts held in common by two or more members of the group. Over time, as the shared mental model changes, organisational learning can be represented.

Linking OL to organisational performance drew on the fact that this research has claimed that the proposed benefits attributed to OL, in comparison to individual learning, emanating from the OL processes facilitating organisational performance through the development of a broader understanding of the business environment and development of a shared vision which in turn provides the basis for unified action.

Finally, it was proposed that lower-level learning is likely to change mental models in a small way (if at all) as information is processed that is a close repetition of what has been done before. Higher-level learning is likely to lead to a larger change in mental models as this leads to new understandings. Consequently, the identification of learning levels may be evidenced as individuals that display a small difference in mental maps over the period of the study correspond with lower-level learning whilst individuals that display large changes in mental maps over the course of the study correspond with higher-level learning. Just as individuals within an organisation can engage in different levels of learning, when they share this learning, the shared mental models that develop (organisational learning) can also be classified as lower or higher level depending on the amount of change.

CHAPTER 6

6. Research Methods

6.1 INTRODUCTION

The purpose of the chapter is to present the methods used to research the process and value of OL. The sample employed in the research is described and subsequently, the method of eliciting and comparing the mental maps of the sample organisations managers, which is fundamental to the research design, is outlined. Cognitive techniques have particular issues surrounding validity and reliability and these are discussed. Finally, the measures utilised to analyse the data are explained.

6.2 POPULATION AND SAMPLE

The premise of this research was that OL may occur when any group of three or more members interacts in an organisational context. The population therefore, is any organisation of three or more members which will include a vast array of organisations that will differ significantly, for example, in terms of size and industry. The sample needed to reflect this heterogeneity to be able to improve the validity of the conclusions. A sample of twenty six organisations was initially identified as potential participants through the researcher's contacts with executive MBA programmes. The contacts were sent a preliminary questionnaire to assess the suitability of the organisation for involvement in the study (Appendix A) of which twelve were returned. Seven were chosen according to the main criteria of a noticeable change occurring in the organisation (hence expectations of changing mental models), access to managers which was important given the invasive and time consuming nature of cognitive mapping

research, and permission to talk openly about organisational issues and strategies which potentially involves sensitive information.

Table 6.1: Initial Participant Organisations and Focal Departments

<i>ORGANISATION</i>	<i>BRIEF DESCRIPTION</i>
A	Industry: <i>Education</i> Department: <i>Sales</i>
B	Industry: <i>Financial services</i> Departments: <i>Loan account opening and card account opening</i>
C	Industry: <i>County council</i> Department: <i>Community services</i>
D	Industry: <i>Transport</i> Departments: <i>Group procurement / project management / quality control and testing</i>
E	Industry: <i>Manufacturing</i> Department: <i>Production</i>
F	Industry: <i>Manufacturing</i> Department: <i>Production</i>
G	Industry: <i>Gas</i> Department: <i>Sales</i>

Of these seven organisations and ten departments, four organisations and four departments remained useable after the 12 month study. Organisation B, an online financial services provider refused permission for the continuation of the study after the main contact left the company after the first interview stage. Organisation F, an iron foundry, became unusable after two of the production managers involved in the study left before the second interview stage. Organisation G was a large multi-national organisation that is primarily involved in manufacturing environmental technologies, laser gases, and safety and industrial hygiene equipment. Data was collected for organisation G at both phases, however, at the second interview stage the top management representative was unavailable and an alternative manager was interviewed. After further analysis it was decided that 'like' was not being compared with 'like' and the organisation was not used. Initially, Organisation D which is a multi-national firm involved in transportation manufacturing was deemed suitable as

providing three departments for the research and so providing some indication of the breadth of OL across a large organisation. However, although suitable participants were identified from three functional areas, in such a large organisation which works according to cross functional project principles, it was difficult to define responsibilities and boundaries in such a way as to fit the study. Finding a suitable top management figure directly responsible for the team members was also difficult. Further, as the research progressed frequent role changes meant that the context for the interviews over the two points in time changed, and again, like was not being compared to like. The result was to focus on three managers who remained in their positions over the course of the study and utilise one senior manager. The final study organisations are outlined in Table 6.2 (for the sake of clarity, these organisational studies have been re-designated A-D):

Table 6.2: Final Study Organisations

<i>ORGANISATION</i>	<i>BRIEF DESCRIPTION</i>	<i>PARTICIPANTS</i>
C <i>Re-designated as Organisation A</i>	Industry: <i>County council</i> Department: <i>Community services</i>	<i>Top management:</i> Senior manager <i>Management team:</i> 3 Area managers
E <i>Re-designated as Organisation B</i>	Industry: <i>Manufacturing</i> Department: <i>Production</i>	<i>Top management:</i> Managing director Operations director <i>Management team:</i> 3 Production managers
A <i>Re-designated as Organisation C</i>	Industry: <i>Education</i> Department: <i>Sales</i>	<i>Top management:</i> Learning resources director <i>Management team:</i> 3 Sales managers
D <i>Remains designated as Organisation D</i>	Industry: <i>Transportation Manufacturing</i> Department: <i>Engineering project team</i>	<i>Top management:</i> Operations manager <i>Management team</i> 1 <i>Engineering manager</i> 1 <i>Production manager</i> 1 <i>Project quality assurance manager</i>

A: County council community social services department

Organisation A was a county council learning disability service provider. The stated aims were to promote the rights, independence, choice and inclusion of people with learning disabilities. The service is a partnership of the District and Borough Councils, NHS, Social Services, Housing Agencies and Education, and offers a diverse range of services from dealing with sleeping difficulties to aiding employment. What has historically been a relatively unaffected public service was undergoing change particularly due to governmental influence.

B: Manufacturing company production department

Organisation B was a small engineering firm that employed, at the beginning of 2005, 130 staff in the U.K. with an annual turnover of around £8m. Historically profitable for over 20 years, the business recorded its first loss at the end of the 2003 financial year, primarily due to a strong pound and competition from Turkey and China. The company responded by cost cutting and redundancies in the first half of 2004 and a change from piece-rate to cell production methods.

C: Educational equipment company sales department

Organisation C was established almost 40 years ago as an engineering company manufacturing educational equipment for higher education. At the beginning of 2005, the core company employed 65 personnel, most of who were in the engineering and manufacturing departments. Further departments are marketing, shipping and accounting, and the focus of this research, sales, in addition to overall support departments. There was an agent network that represented the organisation in 80 countries. The sales department has seen significant change in recent years, for example,

essentially conducting all of its worldwide sales via the internet rather than by sales personnel, sales targets being agreed rather than imposed and a declining order intake.

D: Engineering Project Team

Organisation D was part of a multinational corporation that manufactures and maintains rail vehicles on a global scale. The engineering project team included in this research includes not just the engineering function, but production, procurement, project management, finance, quality and supply chain management which comprised a team of approximately 80 people. The participants involved in this research are the operations manager (senior manager) who oversaw the functioning of the team and management representatives: engineering manager, production manager, and project quality assurance manager. The global organisation has undergone frequent restructuring and rationalisation programs in what the company described in 2004 as 'difficult' times for the rail industry. However, there is cause for optimism in the U.K. as the firm had signed large orders and the future of U.K. manufacturing seemingly assured for the near future. Focus shifted in the early 2000s from redundancies to filling positions with suitably qualified staff to be able to maintain quality standards.

6.3 ELICITING AND COMPARING INDIVIDUAL AND COLLECTIVE CAUSAL COGNITIVE MAPS

The method employed was based upon Laukannen's (1994) replicable elicitation technique which constructs cause maps using interview data from managers and then analyses the data using a database technique which facilitates the critical comparison and aggregation of maps. Therefore, the subjective concepts and causal ideas of individual managers and management teams can be described and differences and

similarities compared over time. The mental mapping method was crucial as the meaning of a causal map is not only a function of the map itself, but of the way it is elicited (Markoczy and Goldberg, 1995) and when comparing maps, the method must be as uniform as possible over participants so 'like is being compared to like'.

Laukkanen's method has been used to explore, for example, after-event reviews (Ellis and Davidi, 2005), academic entrepreneurship (Laukkanen, 2003), stakeholder thinking (Laukkanen and Peltoniemi, 1995), the cognitions of British and Indian managers regarding strategic human resource management (Budhwar and Sparrow, 2002) and is recommended by Bood (1998) for comparative causal mapping studies.

The interview periods were between January - April 2005 and January - March 2006 with the individual interviews being as close as possible to 12 months apart. At the end of the data collection phase there were 34 usable interviews (2 per subject). The interviews took place either at the subject's place of work or the University Business School. The interviews began by asking all departmental manager interviewees the same question to produce anchor themes:

What are the five most important factors that your department must focus on to contribute to organisational performance improvement?

The top managers were asked a very similar question:

What are the five most important factors that [the department being researched] must focus on to contribute to organisational performance improvement?

Five anchor themes were utilised as the preliminary questionnaires identified that all respondents were able to provide at least five success factors. Further, when the causal mapping methodology was piloted on a convenience sample of five managers, after five anchor themes were explored the number of causes and effects became noticeably less compared with the first anchor theme and repetition was common, signalling that ideas were becoming exhausted. By utilising anchor themes (sub themes around which the

discussion proceeds) the probing process remains focused, as a non-structured process in comparative causal mapping would create numerous redundant data and probably low uniformity and reliability (Laukannen, 1998). Reliability over the interviews is important for comparative studies and particular attention was paid to interview consistency, for example, allowing each respondent five anchor themes and two probing questions per theme.

The interview then explored the causes and effects based on these anchor themes, with two prompting questions:

1. *What are the effects of [anchor theme], then what are the effects of [effect]*
2. *What are the causes of [anchor theme], then what are the causes of [cause]*

Notes are taken on a causal note sheet template which records natural language terms (nodes) and the cause and effect relationships between these (arrows). These maps were drawn in conjunction with the manager who verified the maps throughout the elicitation process. An example of the construction of a causal cognitive map is given below:

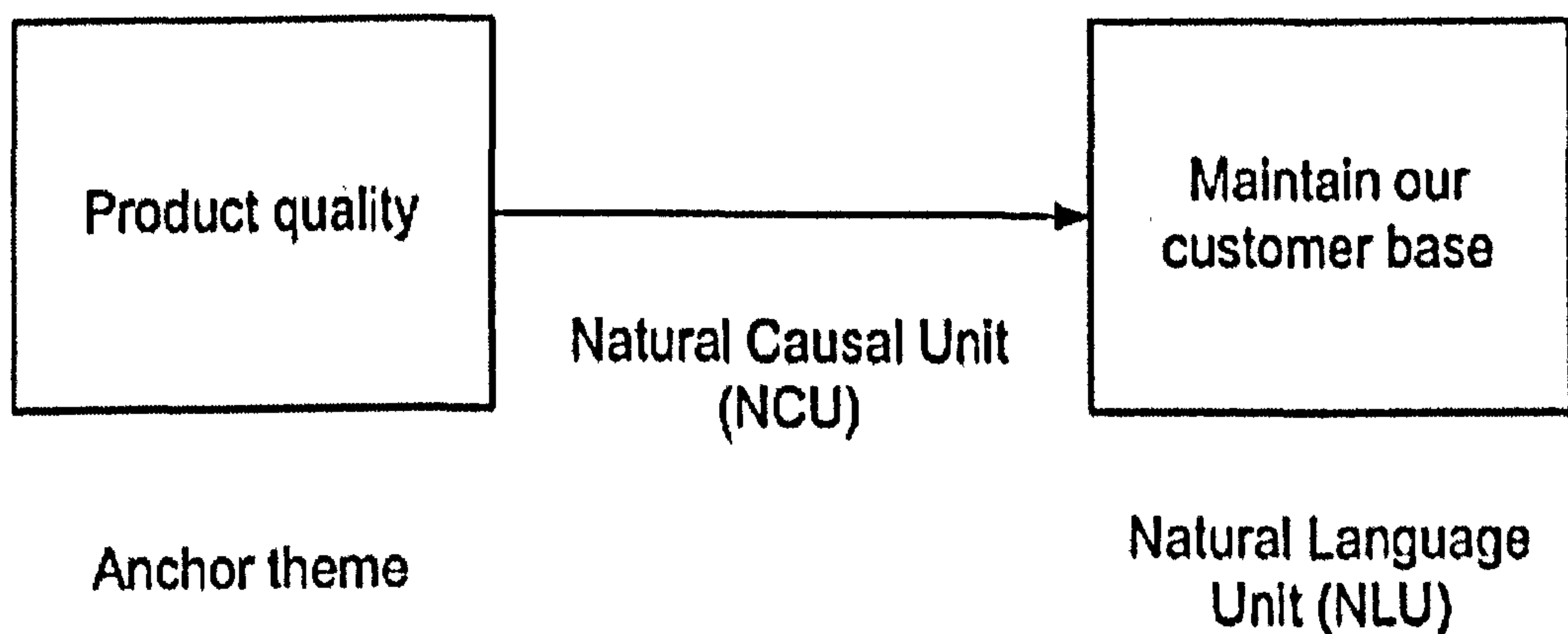


Figure 6.1: Causal Mapping

To achieve comparability it is necessary to standardise the natural language used by the managers. Standardising removes information redundancy that is caused by synonymous words, concepts and expressions. For example, “maintain our customer base” and “keep existing customers” can be standardised as “customer retention”.

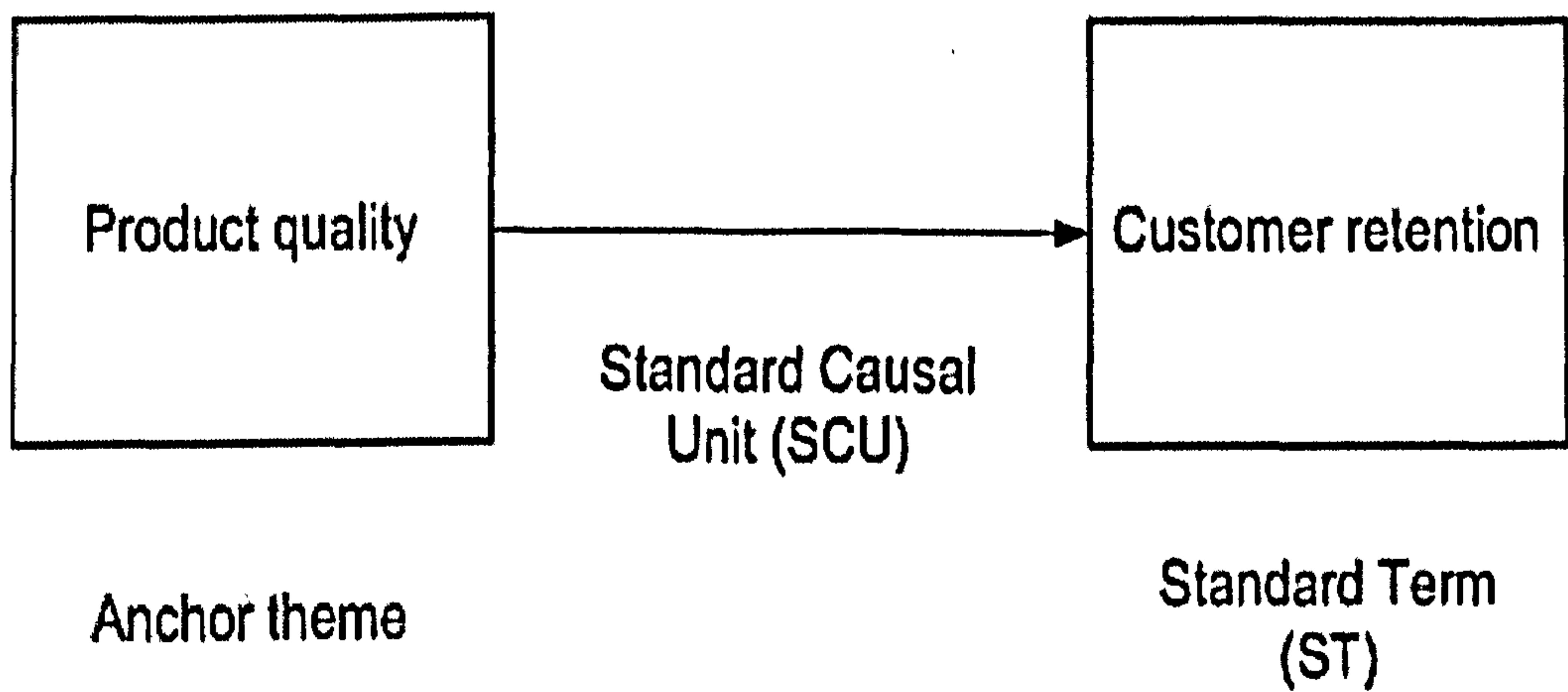


Figure 6.2: Standardising the Causal Map

This is a critical process in comparative cause mapping and validity was aided by keeping as close to the natural language as possible. However, a comparative analysis of cause maps must inevitably require a trade-off between saliency, capturing the variables and relationships which accurately reflect the cognition of the individual and comparability, ensuring that there is sufficient commonality between the maps to make meaningful comparisons. Carrying out the standardisation post-hoc and keeping as close to natural language used by the participant as possible meant this analysis tended towards data saliency. Other methods have tended to use *a priori* variables where all the variables in a map are presented to the respondent who then makes the causal links. While these methods have benefits in terms of analysis and reliability, questions of validity must be raised. For example, whether using these *a priori* variables captures individual views of the world, or whether they force the respondent to work within a set of variables which is not central to their individual cognitions of a situation (Jenkins, 1998). Jenkins (1998 p.241) writes “The danger with such an approach is that it potentially removes a key strength of mapping research: the ability to reflect the divergence of respondents’ reasoning which can detect new aspects of managerial thought not yet considered in the established literature”.

The natural language units (with tags to relate them to their respective standard terms) and cause-effect relationships were then input into a PC application, CMAP2, for

analysis. CMAP2 processes the data and allows for the comparative analysis of mental maps by calculating distance measures. The distance data was then further analysed by multidimensional scaling and hierarchical cluster analysis using Statistical Package for the Social Sciences (SPSS). The CMAP2 application also allows the formation of a shared causal map by filtering the standard causal units (SCU) that are common to at least two of the three member management team.

6.4 VALIDITY

Validity in scientific research can be addressed by attention to the three criteria of construct, internal, and external validity (Kidder and Judd, 1986). While these were established for evaluating experimental research and are not fully achievable in real world research settings, they serve as useful benchmarks against which to measure the strengths and weaknesses of the proposed research. Construct validity is the degree to which the variables that have been defined accurately reflect or measure the construct of interest. Internal validity is concerned with the extent to which one can draw conclusions about the causal effects of one variable on another. External validity is concerned with the generalisability of the research results to other similar settings of interest (Kidder and Judd, 1986; Kim, 1993a).

Issues of construct validity particularly arise in the first phase of the research process of eliciting peoples implicit mental models and converting them to explicit mental maps. The concept of validity has often been expressed as the question “Are we measuring what we think we are measuring?” Kerlinger (1973 p.457 *cited* Jenkins 1998). In the context of causal cognitive mapping, this is a particularly difficult question to answer. Individual cognition is, at the present time, unknowable and such maps can only be an attempt to capture a partial structure through concepts and links. However,

Easterby-Smith *et. al.* (1991 p.41) give a differing perspective of validity that is more appropriate to the causal mapping context of “Has the researcher gained full access to the knowledge and meaning of informants?” This leads to the question “Have we allowed the respondent to respond in a way which is salient and meaningful to him or her?” (Jenkins, 1998). Causal mapping using CMAP2 is comparatively high in comparison to other cognitive mapping techniques and is addressed by a carefully developed interview process (Laukkanen, 1992).

Internal validity in this research refers to whether the change in mental maps elicited (learning) can cause a change in an organisations performance. Essentially, it is whether elicited mental maps facilitate and influence action. Causal mental maps have been found to be closely consistent with their operational contexts. In a study of business managers, Laukkanen (1994) found that their causal maps appear consistently similar within industry groups and logically dissimilar when separate groups are compared. The implication was that business managers possess and use patterns of thinking which are unique, logical and rather permanent in their contexts of action. Furthermore, there was evidence that elicited causal maps are consistent with the subjects’ subsequent behavior in terms of later communications elicited or decision-making (Axelrod, 1976; Hall, 1984). Huff (1990) concurs and adds that cognitive maps (particularly causal maps) focus on action. Walsh (1988 p.875), referring to Dearborn and Simon’s (1958) argument, writes “by virtue of the time spent in a particular department or function, managers develop a viewpoint that is consistent with the activities and goals of that department or particular function” and Bougon *et. al.* (1977) point out that this is stored in the minds of managers in the form of cognitive maps and causal maps in particular (Ambrosini and Bowman, 1999). Previous studies have

therefore provided evidence that a causal link exists between elicited cause maps and subjects' subsequent behavior (Axelrod, 1976; Hall, 1984; Mathieu *et al.*, 2000).

External validity, or generalisability, has long been lamented as difficult in OL research because of the unique environments in which each firm exists. The environment, leadership, systems, structure, power and potentially many other factors are possible mediating variables. Given this complexity, the participating organisations were specifically chosen to be heterogeneous so that although direct quantitative comparisons across studies are not made as the organisational environments are likely to be very different, what is proposed is that common trends evidenced from the studies can be generalised as the sample represents a variety of differing contexts.

The basis of this research was predicated upon the premise that individual cognitive change was representative of learning and that this cognitive change can be represented and measured. In essence, the research rests on the assumption that mental maps are accurate and full representations of an individuals mental models, an assumption that, at least at the present time, cannot be proven. It is therefore prudent to advise caution about claims of what has actually been captured empirically and analysed in this research. It is very difficult to validate claims by showing definite links between a representation (cause map) and some cognitive theoretic construct such as a mental model (Laukkanen, 1994). Consequently, it could be argued that a change in mental maps as evidence of learning can only be inferred. However, any method that purports to measure learning could only ever be an indication of learning whilst the human mind remains hidden. The argument presented in this research is that cognitive mapping provides a more in-depth and valid technique in comparison to other methods.

6.5 RELIABILITY

In terms of reliability, it may be defined as a high level of consistency, uniformity and stability in data production over the subjects of observation that are being compared and secondly, data should be replicable by other researchers with similar resources. As has been previously noted, the CMAP2 process involves a reasonable amount of latitude in the interview protocol to provide particularly salient data. The concern with this approach is that this is not as easy to replicate as techniques which utilise *a priori* variables. Resolving the issue of reliability is achieved by the use of structured interviews that elicit anchor themes with the respondent. Then a carefully designed process converts these themes to a standardised natural language and a format required for comparison. The explicit, stepwise CMAP2 process aids reliability, yet is flexible enough to reduce bias caused by researcher's *a priori* conceptions that may inadvertently determine the responses.

6.6 MEASURES

6.6.1 *Distance: Similarity / Dissimilarity between mental maps*

The comparison of elicited mental maps is achieved by calculating distance data with CMAP2. By using a mathematical formula, the degree of similarity or dissimilarity between two mental maps is calculated and expressed as the distance between the two mental maps. A distance figure of 1 means the two maps are completely dissimilar, whereas a distance figure of 0 means they are identical. In practice, the figure will usually be somewhere between the two extremes.

The distance calculation uses the standard causal unit (SCU) database as the data for analysis. The distance between maps is calculated based on the McKeithen *et. al.* (1981) formula:

$$D_i = 1 - (\ln(p_c + 1) / \ln(p_c + p_{tn} + p_{tm} + 1))$$

Where

pc = the number of common elements (of two subjects or clusters) in the SCU sets that are compared

ptn and ptm = number of distinct elements (of two subjects or clusters) in the SCU sets that are compared

This gives a value between 0 (all SCUs fully shared between maps) and 1 (no SCUs shared).

Importantly, it is the SCU database that is utilised rather than the node terms which means that the causal notions information - not only the node information - is used to create the measure of similarity/dissimilarity. Node information alone does not reveal the important linkages and hence, reasons behind the terms usage.

6.6.2 Analysis of Distance Data: Multidimensional Scaling

Multidimensional Scaling (MDS) is a multivariate statistical analysis tool that produces graphical representations of the main characteristics of the data. The nature of the distance data elicited is said to be semi-metrical as both the symmetry (i.e. distance from A-B is the same as the distance from B-A) and minimality (distances are never negative, and 0 if the points are the same point in space) conditions are met, but not triangle inequality (it is possible for the distance between map A and map C to be greater than the distance between map A and map B plus the distance between map B and map C - in other words, in a non-metrical space the shortest distance between two points is not always a straight line) (Markoczy and Goldberg, 1995 p.316, de Leeuw and Heiser, 1982). MDS allows the approximation of semi-metrical data in a small number of dimensions making it possible to see directly where the entities are with respect to each other. The advantages of MDS are that it has a strong theoretical basis and it

produces easily accessible pictorial representations of the main characteristics of the data, which are amenable to the exercise of judgement in the interpretation of the results (Neophytou and Molinero, 2004).

6.6.3 Analysis of Distance Data: Hierarchical cluster analysis

Combining MDS with hierarchical cluster analysis (HCA) provides firstly, further insights to help make sense of the groupings (Everitt, 1990) and secondly, a measure of MDS validation. Cluster analysis is cited as being probably the most common technique for analysing distance (or similarity) based data (Markoczy and Goldberg, 1995). The particular strength of HCA is that it provides a cluster agglomeration schedule which reveals similar (and dissimilar) maps stepwise and therefore more information regarding map relationships than just the pictorial representations of MDS. Essentially, clustering involves sorting cases or variables according to their similarity on one or more dimensions and producing groups that maximize within-group similarity and minimise between-group similarity. Kaufman and Rousseeuw (1990, p.1) defined cluster analysis as the classification of similar objects into groups, where the number of groups, as well as their forms, may be unknown (Henry *et. al.*, 2005). There are a number of methods for detecting clusters in multivariate data (Arabie & Hubert, 1992) which differ in the ways they define groups and in the ways they identify groupings in the data, however, HCA has been identified as being the most suited to the analysis of distance data. HCA begins by linking the individual observations closest to one another in a space defined by the dimensions used in the analysis. Once these clusters are formed, they are joined with other clusters or individual observations to create larger clusters. This process continues until all observations are joined together into a single cluster (Henry *et. al.*, 2005).

6.6.4 Cognitive Centrality

By studying the standard terms used and number of linkages into (in-degrees) and away from (out-degrees) the term, the cognitive centrality of the terms (and thus importance to the individual's mental model) can be identified and compared which is useful in aiding the interpretation of some results. Cognitive centrality is expressed as the total frequency (tf), and is calculated utilising the formula:

$$\text{tf (total frequency)} = \text{t(in) in-degrees} + \text{t(out) out-degrees}$$

6.7 PRESENTATION OF RESULTS

The results for each organisational study are presented by:

- 1. A table of the distance results revealing the similarity/dissimilarity between subjects, and the shared, mental maps.**
- 2. A table of results revealing the change over the two interview periods of the subjects' mental maps and the shared mental map compared to the top manager(s) mental maps. This indicated the degree of individual learning and organisational learning over the period of the study and whether this learning converges, or diverges, with the top manager(s) mental maps of the departments contribution to organisational performance improvement.**
- 3. A MDS analysis that reduced the distance results to two dimensions to see directly where the individual and shared mental maps from both interview phases lie with respect to each other.**
- 4. HCA to aid the validation of the MDS results and reveal the strength of the relationships between the individual and shared mental maps.**
- 5. Causal diagrams of the shared mental maps at the two interview periods which displays the content of organisational learning.**

6. A table outlining the standard causal unit ownership of the shared mental model that gives an indication of which individuals are contributing to the content of the shared mental model, to what extent, and the concepts they are contributing.
7. A calculation of the complexity of the shared mental maps at the two interview stages which gives an indication of how 'shared' the concepts were across the management team.
8. The cognitive centrality of the top manager(s) mental maps that reveals the concepts that have been deemed as important.

6.8 SUMMARY

The final sample for the research was outlined as consisting of four study organisations: A county council community service provider, a small manufacturing firm, an educational equipment firm, and a large transportation manufacturing organisation.

The method employed for eliciting causal cognitive maps, Laukannen's (1994) CMAP2 replicable elicitation technique, was outlined. Essentially, the method involves constructing cause maps from interview data of managers and then analyses these using a database technique which facilitates the critical comparison of maps. This allows for the subjective concepts and causal relationships of individual managers to be described and differences and similarities compared over time, representing individual learning. The method also enables the agglomeration of common individual concepts into a shared mental map that can also be described and differences and similarities compared over time, representing OL.

Construct and internal validity issues were discussed in relation to the CMAP2 technique and external validity was argued to be increased by the use of a

heterogeneous mix of study organizations. In terms of reliability, the explicit, stepwise elicitation technique of Laukkanen's (1994) method aids the consistency, uniformity and stability of data production over the subjects.

The measures used to compare the data resulting from causal mapping were then outlined. The basis of the analysis was the distance data, which utilises a mathematical formula to produce a measure of similarity/dissimilarity between mental maps. Multi-dimensional scaling (MDS) then helps make sense of the distance results by producing graphical representations of the main characteristics of the data. By approximating the data to two dimensions it is possible to see where the entities lie with respect to each other. Hierarchical cluster analysis was used to firstly, aid the validity of the MDS results by supporting or contradicting the data groupings and secondly, to give more information into how the groupings formed and the strength of relationships between entities. The following four chapters present the results of the research.

CHAPTER 7

7. Organisation A: Results, Analysis and Discussion

7.1 ORGANISATION A: RESULTS AND ANALYSIS

7.1.1 *Elicited data for comparison*

The Learning Disabilities Service Senior Manager and three Area Managers were interviewed twice, with a period of approximately 12 months between interviews. The Senior Manager was the researcher's contact and the three Area Managers were randomly selected from five available Area Managers. Chapter 6 outlined the method of the interviews and Appendix B includes the raw data sheets from the interviews conducted at the partnership's monthly day-long meeting. 40 causal cognitive maps (5 maps per individual per interview) were elicited consisting of 565 Natural Language Units (NLUs) which were compressed into 91 Standard Terms, resulting in 383 Standard Causal Units (SCUs). For study A, some discussion and examples are provided as the results are presented and analysed to be able to better elucidate the meanings. However, a full discussion of the results and implications is documented at the end of the presentation and analysis of results for each study. An overall discussion and conclusions of the four studies follows in chapter 11.

7.1.2 *Distance Results*

The distance results are a measure of the similarity / dissimilarity between mental maps. The figure ranges from 0-1 and the closer to 0, the greater the similarity between maps. Table 7.1.1 displays the distance results of the mental maps elicited at the two interview phases for the three Area Managers (M1-M3), the shared mental map (SMM) which is an aggregation of the SCUs common to at least two of the Area

Managers, and the Senior Manager (SM). The results are a quantification of the similarity/dissimilarity of the participants mental maps derived from the interviews. For example, at the first interview, the mental map distance between Manager 1 and the Senior Manager was 0.722. The degree to which this result indicates similarity/dissimilarity can only be assessed by a comparison with the other managers' results. At the first interview stage the mental map distance between Manager 2 and the Senior Manager was 0.525 and 0.549 between Manager 3 and the Senior Manager. Therefore, the mental map of Manager 1 was more dissimilar to the Senior Manager than both Manager 2 and Manager 3 when first interviewed. The elicited mental maps are a representation of the managers' mental models regarding the key factors required to improve the performance of the Learning Disability Service (LDS) and the causes and effects of these.

Table 7.1.1 Mental Map Distance Results

	<i>SMM1</i>	<i>SMM2</i>	<i>SM1</i>	<i>SM2</i>	<i>M11</i>	<i>M12</i>	<i>M21</i>	<i>M22</i>	<i>M31</i>	<i>M32</i>
<i>SMM1</i>	0.000									
<i>SMM2</i>	0.561	0.000								
<i>SM1</i>	0.650	0.755	0.000							
<i>SM2</i>	0.572	0.558	0.495	0.000						
<i>M11</i>	0.335	0.597	0.722	0.555	0.000					
<i>M12</i>	0.527	0.452	1.000	0.669	0.467	0.000				
<i>M21</i>	0.205	0.511	0.525	0.523	0.395	0.454	0.000			
<i>M22</i>	0.569	0.365	0.578	0.636	0.531	0.543	0.521	0.000		
<i>M31</i>	0.360	0.514	0.549	0.468	0.601	0.711	0.425	0.449	0.000	
<i>M32</i>	0.548	0.435	0.518	0.495	0.627	0.705	0.529	0.536	0.466	0.000

Key:

<i>SMM1</i>	Shared Mental Map (1st Interview)	<i>M12</i>	Manager 1 (2nd Interview)
<i>SMM2</i>	Shared Mental Map (2nd Interview)	<i>M21</i>	Manager 2 (1st Interview)
<i>SM1</i>	Senior Manager (1st Interview)	<i>M22</i>	Manager 2 (2nd Interview)
<i>SM2</i>	Senior Manager (2nd Interview)	<i>M31</i>	Manager 3 (1st Interview)
<i>M11</i>	Manager 1 (1st Interview)	<i>M32</i>	Manager 3 (2nd Interview)

7.1.3 Convergence or divergence of mental maps from the senior manager

By utilising the distance results, the change in the individual Area Managers' mental maps in comparison to the Senior Manager's mental maps at the two interview stages can be calculated. This provides an indication of whether the individual managers learning (as evidenced by a change in the elicited mental maps) over the 12 month period has resulted in a closer alignment, or divergence with the learning of the Senior Manager over the same period of time. The calculation of how the SMM has changed at the two interview stages in relation to the Senior Manager was also performed to analyse whether OL has resulted in learning that converges, or diverges, with the learning of the Senior Manager. To continue with the example of Manager 1, at the first interview the distance between this Manager and the Senior Manager was 0.722. Twelve months later, both the Senior Manager and Manager 1 were interviewed again using the same methodology as at interview 1. The distance result at the second interview was 0.669 between Manager 1 and the Senior Manager. Over the period of twelve months the mental maps of Manger 1 and the Senior Manager have become more similar, in this case, a convergence between the mental maps of 7%. Again, this figure is most enlightening when compared with the other Area Managers. The mental maps of Manager 2 and the Senior Manager diverged (became more dissimilar) by 21%, and that of Manager 3 and the Senior Manager converged by 10%.

Table 7.1.2: Mental Map Change Over the Interview Phases

	<i>Distance difference between interviews / Distance from SM at 1st Interview x 100</i>		
	<i>1st Interview</i>	<i>2nd Interview</i>	
<i>SMM</i>	<i>0.650</i>	<i>0.558</i>	14% (convergence)
<i>M1</i>	<i>0.722</i>	<i>0.669</i>	7% (convergence)
<i>M2</i>	<i>0.525</i>	<i>0.636</i>	21% (divergence)
<i>M3</i>	<i>0.549</i>	<i>0.495</i>	10% (convergence)

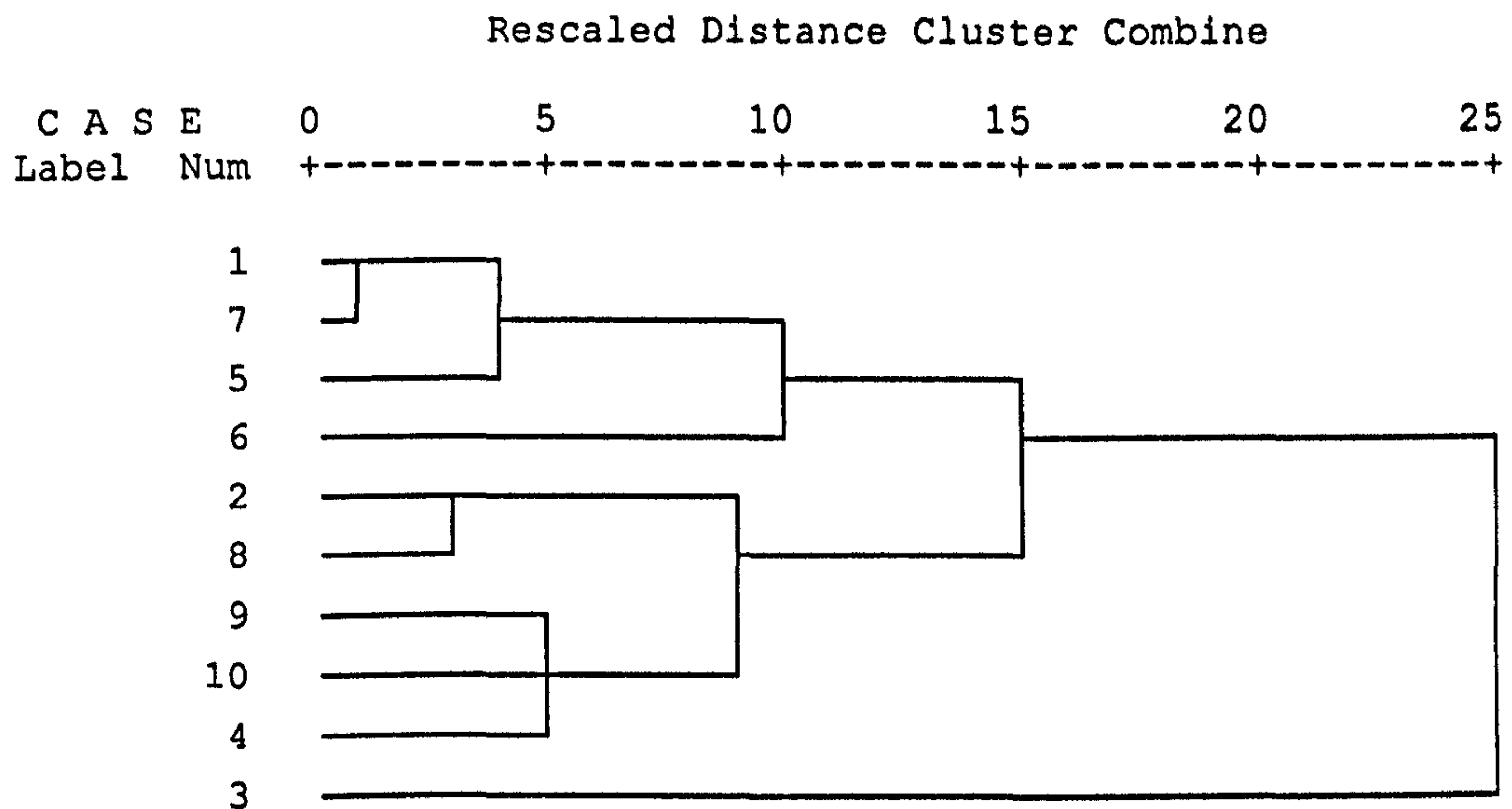
7.1.4 Mental Map Proximities: Multi-dimensional scaling and Hierarchical cluster analysis

Multidimensional scaling (MDS) allows a pictorial representation, utilising the distance results, of where the individual managers' mental maps and the shared mental maps lie with respect to each other. Hierarchical cluster analysis (HCA) supports (or weakens) the proximities resulting from MDS and provides further information, such as cluster agglomeration. This gives insights regarding how the individual managers' mental maps and shared mental map regarding LDS performance improvement factors change over the interviews with respect to one another. The SMM proximities also give an indication of which individual area managers are contributing more (or less) to the SMM.

Table 7.1.3: Hierarchical Cluster Analysis Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	SMM1	M21	.120	0	0	3
2	SMM2	M22	.331	0	0	6
3	SMM1	M11	.417	1	0	7
4	M31	M32	.497	0	0	5
5	SM2	M31	.537	0	4	6
6	SMM2	SM2	.872	2	5	8
7	SMM1	M12	.927	3	0	8
8	SMM1	SMM2	1.371	7	6	9
9	SMM1	SM1	2.270	8	0	0

The hierarchical cluster analysis agglomeration schedule reveals the strengths of the relationships between the managers' mental maps. The Table 7.1.3 displays the data results and Figure 7.1.1 displays these results on a dendrogram which is more easily interpreted.



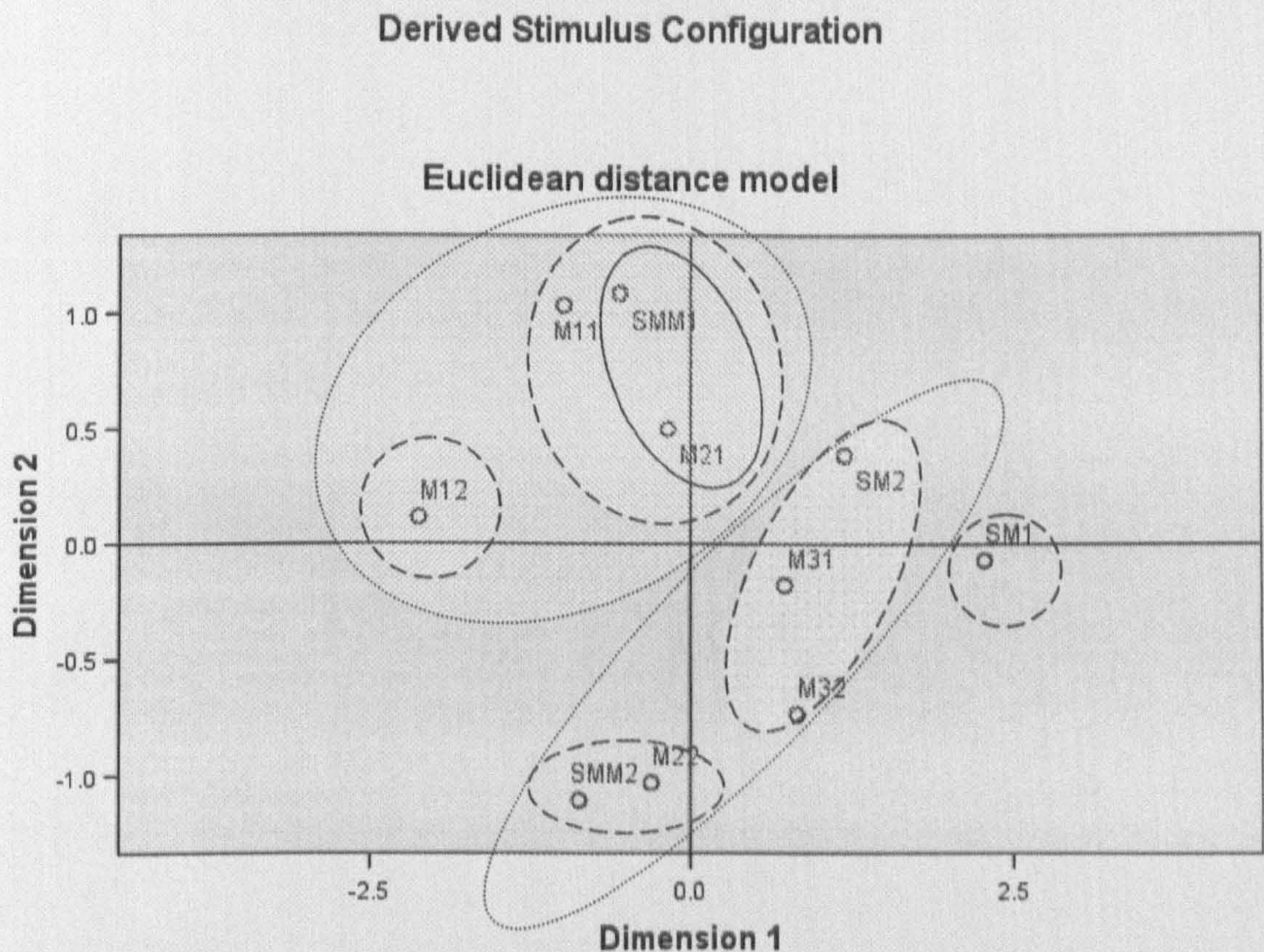
Key:

Case	Case	Case	Case	Case
1	SMM1	3	SM1	5
2	SMM2	4	SM2	6
				7
				M11
				8
				M12
				9
				M21
				10
				M22
				3
				M31
				M32

Figure 7.1.1 Hierarchical Cluster Analysis Dendrogram

The dendrogram displays the schedule of when the mental maps were agglomerated. Essentially, a mathematical calculation is used that seeks similarities from the distance results data and combines the maps into clusters according to their similarity iteratively until all cases have been combined into a single cluster. The diagram above shows that cases 1 and 7 (the shared mental map at the first interview and Manager 2 at the first interview) are closely related (similar) as they are agglomerated quickly into a cluster. The next cluster to form is between cases 2 and 8 (the shared mental model at interview 2 and Manager 2 at interview 2) showing similarities between these mental maps. Subsequently, case 5 (the mental map of Manager 1 at interview 1) is included into the cluster of cases 1 and 7. The process then continues until all cases have been included into a single cluster. Case 3 (the mental map of the Senior Manager at the first interview) is the final case to be clustered and so

is the most dissimilar to all of the other cases. It is most useful to look for larger gaps in the agglomeration schedule and hence reveal identifiably differing clusters. Stages 1, 5 and 7 (highlighted in Table 7.1.3) show comparatively larger gaps and are used to illustrate the strength of the relationships (similarities) between mental maps. MDS and HCA are represented pictorially in Figure 7.1.2:



Key:

<i>SMM1</i>	Shared Mental Map (1st Interview)	<i>M12</i>	Manager 1 (2nd Interview)
<i>SMM2</i>	Shared Mental Map (2nd Interview)	<i>M21</i>	Manager 2 (1st Interview)
<i>SM1</i>	Senior Manager (1st Interview)	<i>M22</i>	Manager 2 (2nd Interview)
<i>SM2</i>	Senior Manager (2nd Interview)	<i>M31</i>	Manager 3 (1st Interview)
<i>M11</i>	Manager 1 (1st Interview)	<i>M32</i>	Manager 3 (2nd Interview)

Cluster agglomeration key:

1. Strong Association (Strong similarities) —————
2. Moderate Association (Moderate similarities) - - - - -
3. Weak Association (Few similarities)

Figure 7.1.2: MDS and HCA of mental maps

Figure 7.1.2 utilises MDS and HCA of the distance results to produce a graphical representation of where the managers' mental maps and the shared mental maps lie with respect to each other at both interview stages and the strength of these associations (i.e. the degree of similarity/dissimilarity). The points on the figure (e.g. M11, SM1 etc.) are the results of MDS which represents the distance results data in two dimensions and can be interpreted by looking for groupings. Those that group more closely display similarities. To validate these groupings and to get further insights into the strength of these similarities/dissimilarities, HCA is used. The HCA results are represented by the circular lines superimposed on the MDS results. The HCA results reveal that the shared mental map at interview 1 (SMM1) and Manager 2 at the first interview (M21) have a strong association and are the most similar. Those points within the dashed lines show a moderate association, so for example, Manager 1 at the first interview (M11), Manager 2 at the first interview (M21) and the shared mental map at the first interview (SMM1) have been agglomerated at this stage and hence, show moderate similarities. Those points within the dotted line show weaker similarities. The Senior Manager at interview 1 is the only case not to be agglomerated within the weak associations and remains alone in a cluster until the final agglomeration. The result reveals that this mental map has a less than weak association with all of the other mental maps and therefore considerably differs from all of the other cases.

7.1.5 Organisational Learning of Study A

Quantitative results of the managers' mental maps and the shared mental maps have been presented, but these do not reveal any significant information regarding the content of the maps. Although the content of the individual managers' mental maps are too large to present pictorially, the shared mental map can be illustrated. By filtering out

the SCUs that are common to at least 2 of the 3 area managers, the shared mental map can be depicted at each interview phase and the change in the maps demonstrates organisational learning.

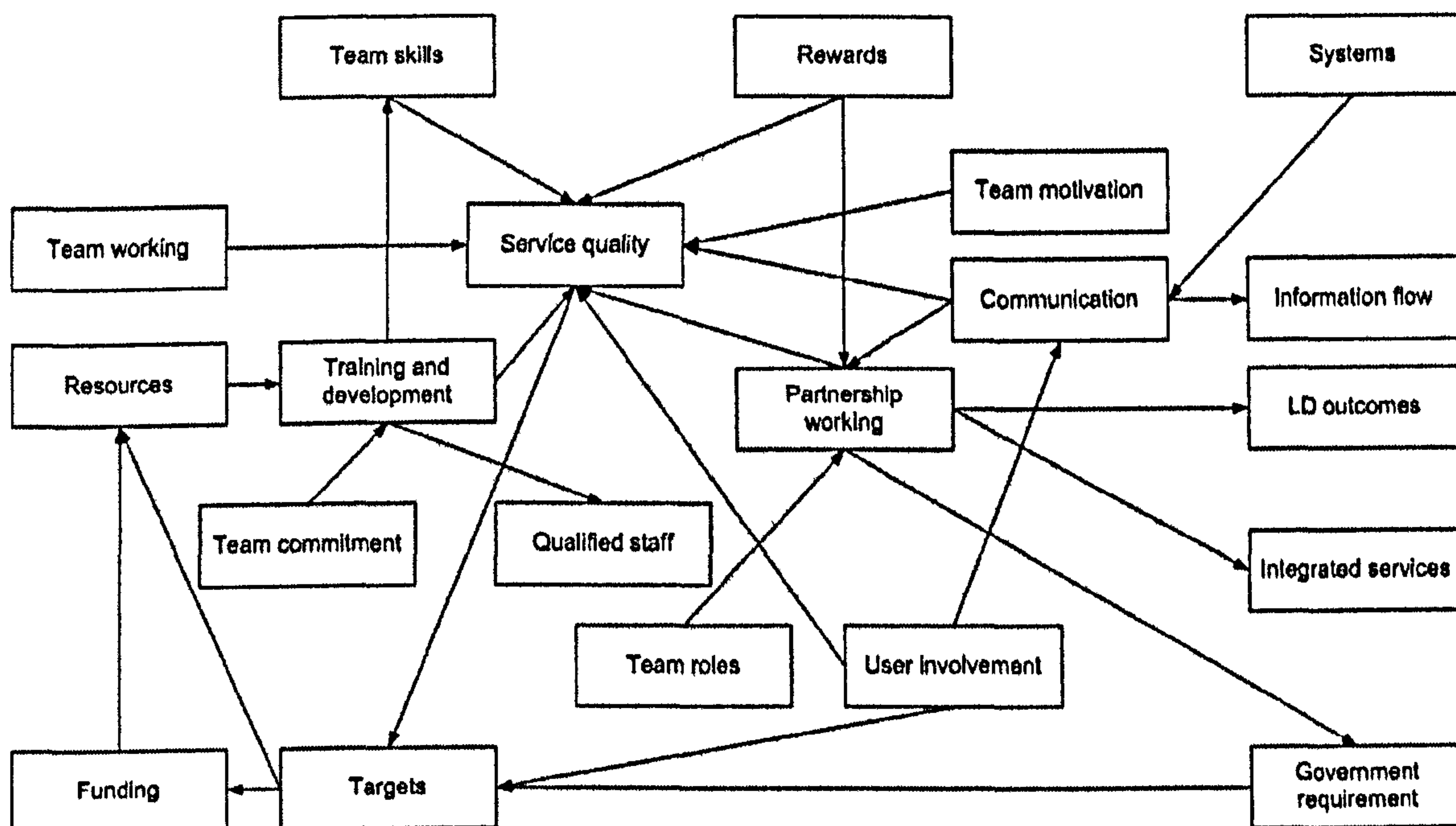


Figure 7.1.3 Shared Mental Map at the Interview 1

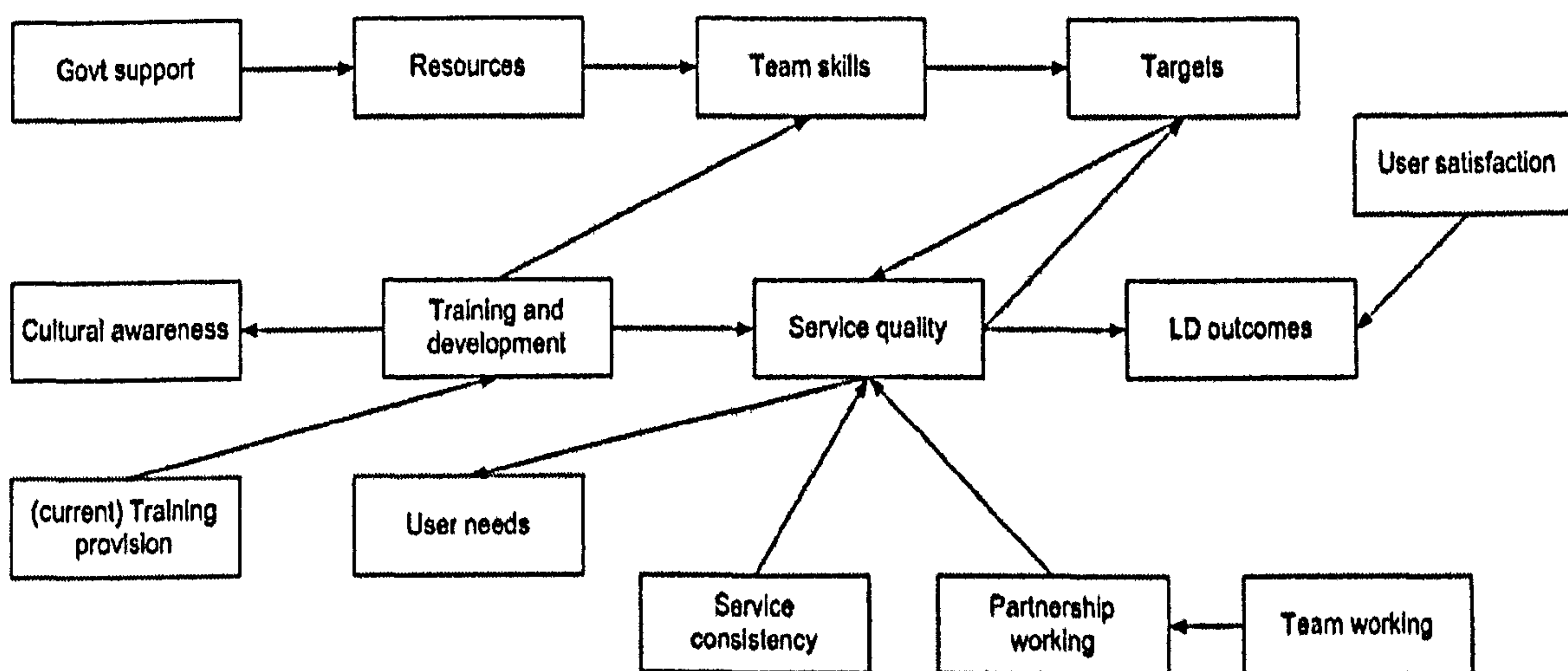


Figure 7.1.4: Shared Mental Map at the Interview 2

7.1.6 Shared Mental Map (SMM) Standard Causal Unit (SCU) Ownership

Further information regarding organisational learning can be gained by relating the SCUs to the individual managers who collectively make up the SMM. By comparing the SMM SCUs with the Senior Manager's mental map reveals how the SMM agrees or differs with the Senior Manager's mental map of LDS performance improvement factors.

Table 7.1.4: SMM SCU Ownership at Interview 1

SMM Standard Causal Units		Inclusion in Individual Manager Mental Maps			Senior Manager
<i>Cause</i>	<i>Effect</i>	1	2	3	
Team working	Service quality	Yes	Yes	No	No
Team commitment	Training and development	Yes	Yes	No	No
Team skills	Service quality	Yes	Yes	Yes	Yes
Team motivation	Service quality	Yes	Yes	No	No
Team roles	Partnership working	Yes	Yes	No	No
Training and development	Team skills	Yes	Yes	Yes	Yes
Training and development	Qualified staff	Yes	Yes	No	No
Training and development	Service quality	Yes	Yes	Yes	No
Rewards	Service quality	No	Yes	Yes	No
Rewards	Partnership working	Yes	Yes	No	No
Communication	Service quality	Yes	Yes	Yes	No
Communication	Partnership working	Yes	Yes	Yes	No
Communication	Information flow	Yes	Yes	No	No
Funding	Resources	Yes	No	Yes	No
Targets	Funding	No	Yes	Yes	Yes
Targets	Resources	No	Yes	Yes	No
Resources	Training and development	Yes	Yes	No	No
Government requirement	Targets	No	Yes	Yes	No
User involvement	Communication	Yes	Yes	No	No
User involvement	Targets	No	Yes	Yes	No
User involvement	Service quality	No	Yes	Yes	No
Service quality	Targets	No	Yes	Yes	No
Systems	Communication	Yes	Yes	No	No
Partnership working	Integrated services	No	Yes	Yes	Yes
Partnership working	Government requirement	No	Yes	Yes	No
Partnership working	Service quality	Yes	Yes	No	No
Partnership working	Favourable LD outcomes	Yes	Yes	No	No
<i>Total SCUs</i>	<i>27</i>	<i>18</i>	<i>26</i>	<i>15</i>	<i>4</i>

Table 7.1.5: SMM SCU Ownership at Interview 2

SMM Standard Causal Units		Inclusion in Individual Manager Mental Maps			Senior Manager
<i>Cause</i>	<i>Effect</i>	<i>1</i>	<i>2</i>	<i>3</i>	
Team working	Partnership working	Yes	Yes	Yes	No
Team skills	Targets	No	Yes	Yes	Yes
Training and development	Team skills	No	Yes	Yes	Yes
Training and development	Cultural awareness	Yes	Yes	No	No
Training and development	Service quality	Yes	Yes	No	No
Training provision (current)	Training and development	Yes	Yes	No	No
Government support	Resources	Yes	Yes	No	No
Targets	Service quality	No	Yes	Yes	Yes
Resources	Team skills	No	Yes	Yes	No
User satisfaction	Favourable LD (learning disabled) outcomes	No	Yes	Yes	No
Service consistency	Service quality	Yes	Yes	No	No
Service quality	Targets	No	Yes	Yes	Yes
Service quality	User needs	Yes	Yes	Yes	Yes
Service quality	Favourable LD outcomes	Yes	Yes	No	No
Partnership working	Service quality	Yes	No	Yes	Yes
<i>Total SCUs</i>	<i>15</i>	<i>9</i>	<i>14</i>	<i>9</i>	<i>6</i>

7.1.7 Complexity of maps

The “richness” of the shared mental maps can be calculated by dividing the number of shared SCUs with the total number of SCUs elicited from the three members of the management team. The “richer” the maps, the more SCUs of Learning Department Service performance improvement factors are shared across the management team and consequently, the greater the cognitive consensus.

Table 7.1.6: Complexity of the SMMs

	Shared SCUs	Total SCUs	%
1 st interview	27	198	14
2 nd interview	15	181	8
<i>Difference</i>			<i>43% decrease</i>

7.1.8 Senior manager cognitive centrality

The mental map of the Senior Manager is too large to present pictorially. However, cognitive centrality indicates the concepts that were the most central to the Senior Manager's mental map by calculating the number of linkages into (in-degrees) and away from (out-degrees) the term. The use of this measure was in providing an indication of the Senior Manager's concepts of LDS performance improvement that can be compared with the individual managers learning and OL to give further information behind the distance results. For example, at the first interview the most cognitively central concept for the Senior Manager was meeting targets, whereas at interview 2, this had changed to partnership working.

Table 7.1.7: Senior Manager Cognitive Centrality

	<i>1st Interview</i>	<i>tf</i>	<i>2nd Interview</i>	<i>tf</i>
1	(Meeting) Targets	14	Partnership working	14
2	Team skills	13	Service quality	13
3	Service quality	13	(Meeting) Targets	10
4	Integrated service (provision)	11	(Meeting) User needs	9
5	Patient led	7	(Retain) Excellent status	8

Key: tf (total frequency) = $t(in)$ in-degrees + $t(out)$ out-degrees

7.2 DISCUSSION OF ORGANISATION A

7.2.1 Interview 1

The distance results provide the key measure of mental map similarity/dissimilarity between the individual Area Managers' mental maps, the shared mental map, and the Senior Manager's mental map. The results at the first interview stage are reproduced in rank order below according to the similarity with the Senior Manager's mental map.

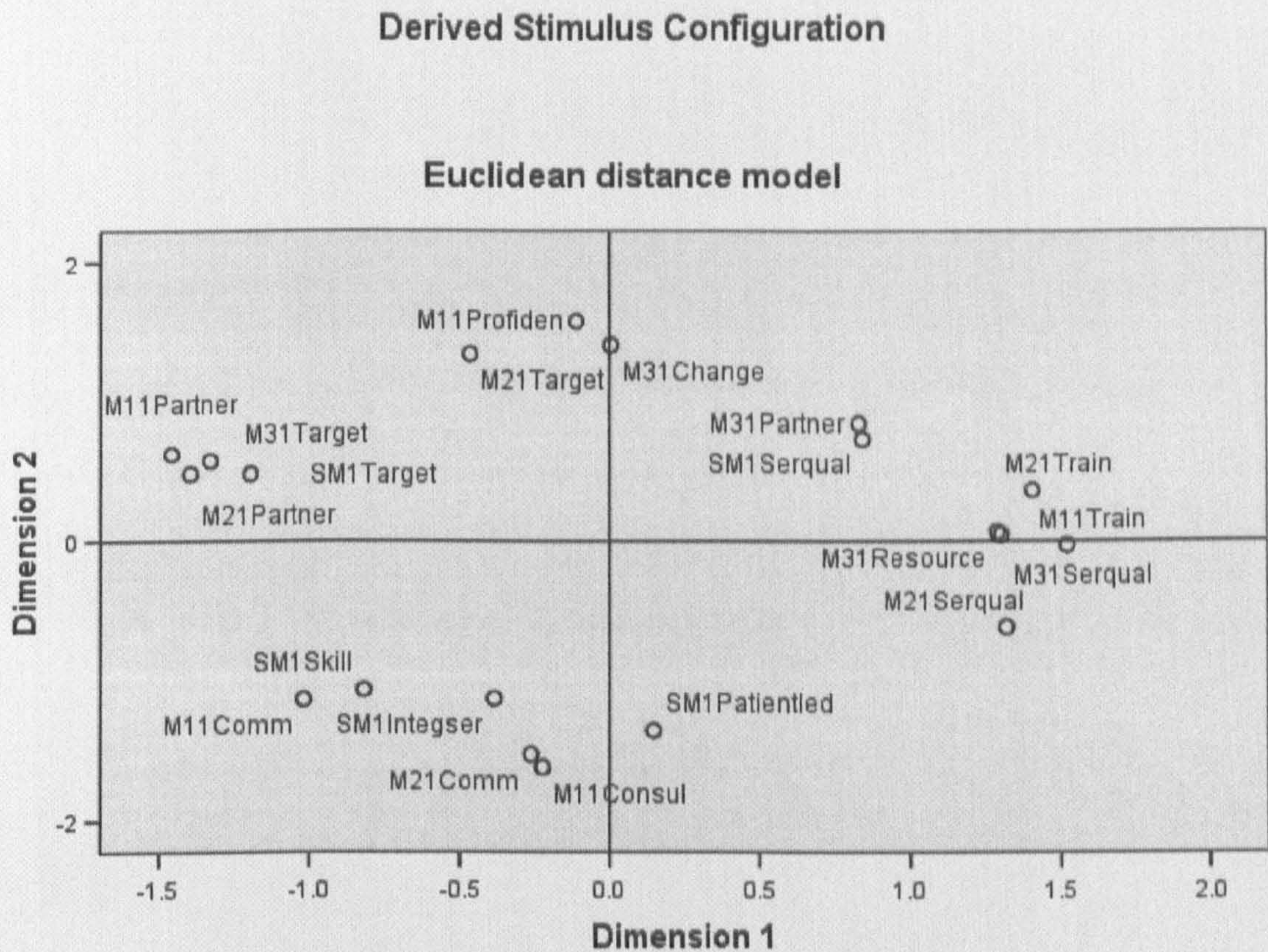
Table 7.2.1: Ranked Distance Results at 1st Interview

<i>Ranking: Similarity to Senior Manager</i>		<i>Distance from Senior Manager Mental Map</i>
1	Area Manager 2	0.525
2	Area Manager 3	0.549
3	Shared Mental Map	0.650
4	Area Manager 1	0.722

These rankings indicate that the mental map of Area Manager 2 is the closest (most similar) to the Senior Manager's mental map of LDS performance improvement at the first interview, whilst Area Manager 1 is the most dissimilar. Multi-dimensional scaling exemplifies this pattern with the mental map proximities corresponding to the above rankings. Hierarchical cluster analysis combines Managers 1 and 2 at the third agglomeration stage revealing similarities between these two Managers yet clusters Manager 3 differently until the final agglomeration stage. This result demonstrated that Manager 3 had a mental map of LDS performance improvement that was noticeably different to Managers 1 and 2. The clustering of the Senior Manager at the first interview is also notable. The mental map forms its own cluster which does not agglomerate until the final stage. The elicited mental map of the Senior Manager at the first interview has been found to be noticeably different from the individual managers' maps and the shared mental map.

By breaking the individual mental maps down into the five anchor theme maps from which they are derived and performing MDS, further information for the differences noted between the managers can be gained.

Figure 7.2.1: Anchor Theme MDS at Interview 1



Key:

<i>Abbreviated anchor theme</i>	<i>Full anchor theme</i>	<i>Abbreviated anchor theme</i>	<i>Full anchor theme</i>
Partner	Partnership working	Change	Ability to change
Target	(meeting imposed) targets	Serqual	Service quality
Comm	Communication	Patientled	Patient led service
Skill	Team skills	Consul	Consultation (with partners)
Profiden	Professional identity	Resources	(increased) Resources
Train	(improving staff) training	Integser	Integrated services

By noting the proximities of the anchor theme maps, the similarity/dissimilarity of the maps is revealed. If the anchor theme maps are in close proximity, then the causes and effects of the anchor theme must be similar. The further the proximity of maps, then the greater the difference between causes and effects. To interpret the MDS anchor theme analysis and highlight areas of similarity and dissimilarity, it is most useful to identify themes and the owners of the themes that group together. Figure 7.2.1 displays a cluster in the top, left-hand quadrant. The cluster is populated by each of the three

Area Managers and the Senior Manager at the first interview. Agreement is evident in the causes and effects of partnership working and meeting targets. It is the ownership of the remaining clusters where the difference between the Area Managers and Senior Manager become apparent. An identifiable cluster is located in the right-hand side of the diagram. In this instance, the cluster is populated by the three Area Managers, but not the Senior Manager. Anchor theme causes and effects that display similarities for the Area Managers are improving staff training, increased resources, and service quality. The bottom, left-hand cluster reveals that of the six anchor themes, three are contributed by the Senior Manager. The causes and effects of team skills, integrated services, and patient led service are deemed important to the Senior Manager, but less so for the Area Managers.

7.2.2 The formation of the shared mental map at interview 1

Figure 7.1.3 displayed the shared mental map derived from combining the standard causal units (SCUs) common to at least two of the three Area Managers. The distance rankings reveal that the SMM is third, behind Managers 3 and 2, in its similarity to the Senior Manager's mental map. MDS and HCA further support the difference and clusters Managers 1 and 2 with the SMM, indicating that the SCUs of these Managers are disproportionately represented in the SMM in relation to Manager 3. Table 7.1.4 breaks down the ownership of the SMM into its contributions from the three managers. The results reveal that the mental map of Manager 2 shares 26 of the 27 SCUs of the SMM, heavily influencing the content of the SMM. The mental map of Manager 1 shares 18 SCUs, whilst Manager 3 shares the least number of SCUs with 15. Relating the SMM SCUs to the Senior Manager's mental map reveals that only 4 SCUs

are held in common. At the first interview stage, the SMM is very different from the Senior Manager's mental map of the concepts of LDS performance improvement.

7.2.3 Interview 2

The results at the second interview stage are:

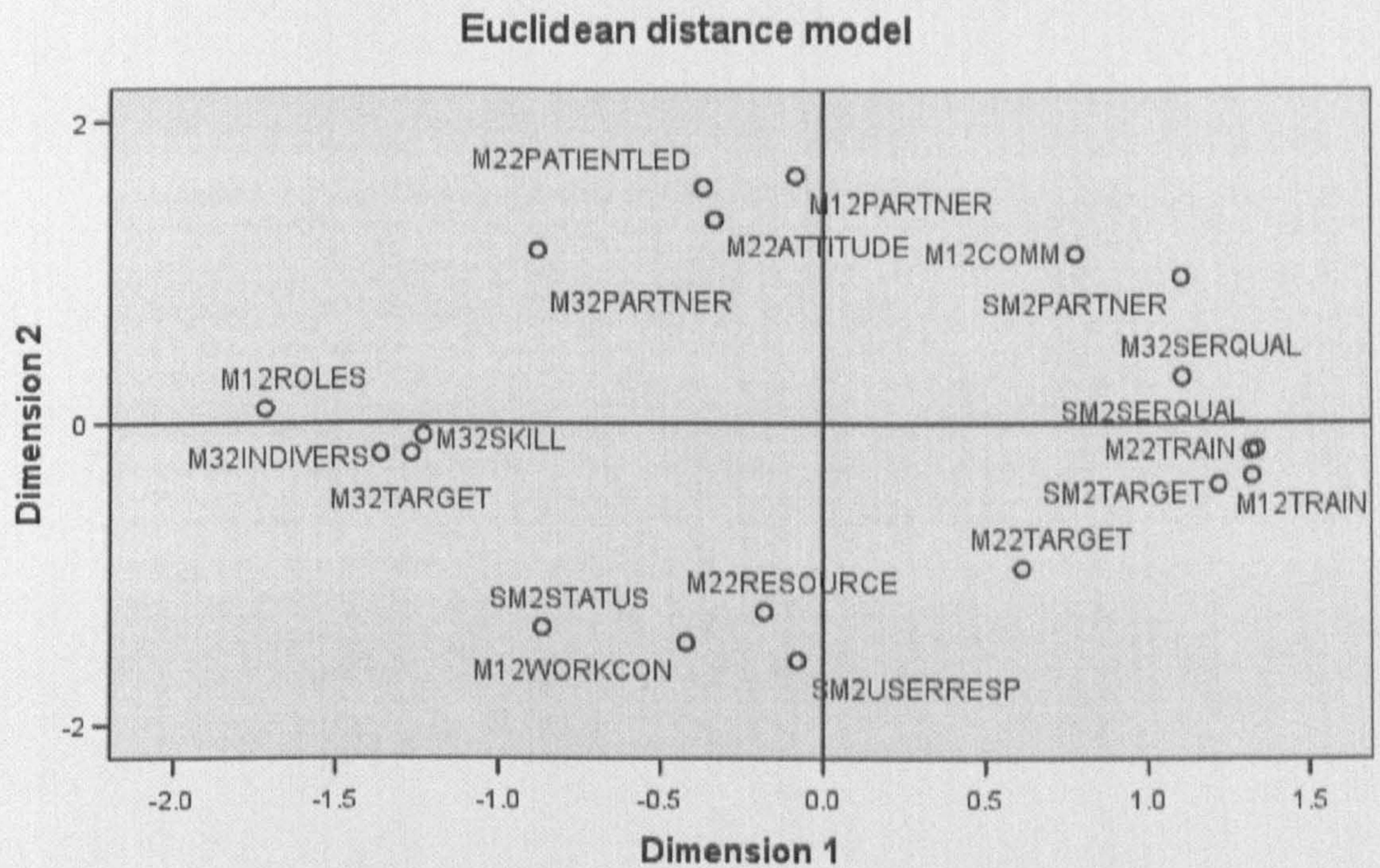
Table 7.2.2: Ranked Distance Results at the 2nd Interview

<i>Ranking: Similarity to Senior Manager</i>		<i>Distance from Senior Manager Mental Map</i>
1	Area Manager 3	0.495
2	Shared Mental Map	0.558
3	Area Manager 2	0.636
4	Area Manager 1	0.669

These rankings indicate that the elicited mental map of Area Manager 3 is the most similar to the Senior Manager's mental map at the second interview, whilst Manager 1 is the most dissimilar. MDS and HCA exemplify this pattern. The mental map of the Senior Manager clusters most closely with Manager 3, followed by Manager 2, with Manager 1 forming a different cluster until the final agglomeration. Area Manager 1 displayed noticeable differences with both of the other Area Managers as well as the Senior Manager.

Again, by breaking the individual mental maps down into the five anchor theme maps from which they are derived and performing MDS, further information for the differences noted between these Managers can be gained.

Derived Stimulus Configuration



Key:

<i>Abbreviated anchor theme</i>	<i>Full anchor theme</i>	<i>Abbreviated anchor theme</i>	<i>Full anchor theme</i>
Partner	Partnership working	Userresp	User responsiveness
Target	(meeting imposed) targets	Serqual	Service quality
Comm	Communication	Patientled	Patient led service
Skill	Skilled team (members)	Workcon	Working conditions
Roles	Team (member) roles	Resources	Resources
Status	(retain) Excellent status	Indivers	Individualised service
Train	(improving staff) training	Attitude	Team (member) attitudes

Figure 7.2.2: Anchor Theme MDS at Interview 2

The left-hand cluster, populated by the Area Managers displays agreement surrounding the anchor themes team member roles, individualised service, skilled team members, and meeting targets. The Senior Manager predominantly clusters on the right-hand side of the diagram. Area Manager 1 does not demonstrate a separate cluster to explain the differences with the other Area Managers and the Senior Manager. Rather,

the lack of a definite grouping indicates that the nature of the differences varied with each individual Manager.

7.2.4 *The formation of the shared mental map at interview 2*

The distance rankings reveal that the SMM is behind only one Area Manager (Manager 3) in its similarity to the Senior Manager's mental map at the second interview stage. MDS and HCA supports the rankings and clusters Managers 2 and 3 most closely with the SMM, indicating that the SCUs of these Managers were proportionately more highly represented in the SMM in comparison to Manager 1. Table 7.1.5 breaks down the ownership of the SMM into its contributions from the three Managers. The results show that the mental map of Manager 2 shares 14 of the 15 SCUs of the SMM, heavily influencing the content of the SMM. The mental map of Manager 1 shares 9 SCUs, whilst Manager 3, the Manager closest to the mental map of the Senior Manager, also shares 9 SCUs. Relating the SMM SCUs to the Senior Manager's mental map reveals that 6 of the 15 SMM SCUs are held in common.

7.2.5 *Change over the interview period: Individual learning*

The results from the two interview stages are reproduced in rank order below according to the amount of convergence (or divergence) with the Senior Manager's mental maps.

Table 7.2.3: Ranked Mental Map Change

<i>Distance difference between interviews / Distance from SM at 1st interview x 100</i>				
<i>Rank</i>		<i>1st Interview</i>	<i>2nd Interview</i>	
<i>1</i>	<i>SMM</i>	<i>0.650</i>	<i>0.558</i>	<i>14% (convergence)</i>
<i>2</i>	<i>M3</i>	<i>0.549</i>	<i>0.495</i>	<i>10% (convergence)</i>
<i>3</i>	<i>M1</i>	<i>0.722</i>	<i>0.669</i>	<i>7% (convergence)</i>
<i>4</i>	<i>M2</i>	<i>0.525</i>	<i>0.636</i>	<i>21% (divergence)</i>

The individual mental map results (the shared mental map is considered subsequently) show that the mental map of Area Manager 3 has changed by the second interview to be 10% closer to the mental map of the Senior Manager, closely followed by Manager 2 (7% convergence), whilst the mental map of Area Manager 2 has changed to become 21% more dissimilar. Manager 3 and the Senior Manager have become more aligned (in comparison to the other two Area Managers and the Senior Manager) in their elicited mental maps regarding the performance improvement factors and the causes/effects of these for the Learning Disability Service. The MDS and HCA analysis revealed that although Manager 3 becomes more aligned than the other two Area Managers by the second interview, the mental maps of Manager 3 do not comparatively change a great deal. It is the change in the Senior Manager's mental maps that causes the alignment. This result provides evidence that the agreement was due to the Senior Manager changing her mental models to become more aligned with Area Manager 3. The mental maps of Manager 2 and the Senior Manager, however, have become the least aligned of the three Area Manager-Senior Manager dyads. The analysis revealed that Manager 2 was, in fact, the most similar to the Senior Manager at interview 1. The implication is that between the two interviews the learning of Manager 2 and the Senior Manager in relation to what the LDS must do to improve performance, has diverged. In contrast to Manager 3, Manager 2 displays a comparatively large amount of learning over the interviews as evidenced by the large change in mental maps in comparison with the other Managers. However, this has resulted in a divergence with the Senior Manager regarding LDS performance improvement. Manager 1 shows only marginally less improvement than Manager 3 over the course of the study, however, is the most dissimilar of the Area Managers to the Senior Manager's mental maps at both interviews.

7.2.6 Organisational learning

At the second interview, the SMM is 14% more similar to the Senior Manager than at the first interview, a greater improvement than any of the three Area Managers individually. The SMM develops independently of any individual and so is different to any individual's mental map, however, because the SMM forms from individual learning, individuals will influence its formation and constitute its content. By focusing on the content and ownership of the SMM (see Figures 7.1.3, 7.1.4 and Tables 7.1.4, 7.1.5) and how this changes over the interviews, an indication of why OL has resulted in a better alignment with the Senior Manager in comparison to individual learning can be gained. The SMM SCU ownership tables have shown that Manager 2 strongly influenced the SMM at both interview stages. At the first interview this is in conjunction with Manager 1, with Manager 3 contributing to a lesser degree. At this stage, however, the mental map of Manager 1 was the most dissimilar of the management team when compared to the Senior Manager. By the second interview, Manager 2 continues to disproportionately influence the SMM, but now the mental map of Manager 1 declines in influence on the SMM in favour of Manager 3. MDS and HCA display that the mental map of Manager 3 has changed (comparatively) by only a small amount and it is the mental map change of Manager 2 that aligns these two managers thinking. In other words, by the second interview Manager 2 had changed his thinking of what constituted LDS performance improvement to be more in common with Manager 3, who had relatively similar concepts of LDS improvement at both interviews. This supports the rationale of the OL/OP model in that over the period of the study some of the concepts that Manager 1 held regarding LDS performance improvement have been replaced in favour of the concepts held by Manager 3 who was considerably closer to the Senior Manager's mental map of LDS performance

improvement. The validation process has removed some of the concepts held by Manager 1 that were at odds with the thinking of the Senior Manager in favour of those held by Manager 3 that were more congruent with the Senior Manager. The fact that it was predominantly a change in the thinking of the Senior Manager in regards to LDS improvement towards concepts held by Manager 3 was also an important result. It was indicative of the Senior Manager having learned ideas of LDS performance improvement from Manager 3, rather than vice-versa.

7.2.7 Higher and lower level learning

It was proposed that higher-level learning can be equated to a large change in mental maps and lower level learning with a smaller change in mental maps. Figure 7.1.2 demonstrates that the mental map of Manager 3 changes comparatively little over the two interviews and both cluster together at the second agglomeration. Conversely, Manager 2 displays a comparatively large change in mental maps, represented by the proximity of the maps and membership of these maps as they develop into different clusters. This gives an indication of, formerly, lower level learning and latterly, higher level learning.

CHAPTER 8

8. Organisation B: Results, Analysis and Discussion

8.1 ORGANISATION B: RESULTS AND ANALYSIS

8.1.1 *Elicited data for comparison*

The top management in this study were represented by the Managing Director and the Operations Director (the researchers contact) whilst the production department is represented by the firms three Production Managers. The participants were interviewed twice according to the method outlined in chapter 6, with a period of approximately 12 months between interviews and the raw data sheets are included in Appendix C. 50 causal cognitive maps were elicited consisting of 691 Natural Language Units which were compressed into 82 Standard Terms, resulting in 395 Standard Causal Units. The presentation of results and analysis follows the same structure as study A, followed by a discussion. How these results compare and relate with study A (and the subsequent studies) is the focus of chapter 11.

8.1.2 *Distance Results*

Table 8.1.1 displays the distance results of the mental maps elicited at the two interview phases for the three Production Managers (M1-M3), the shared mental map (SMM) which is an aggregation of the SCUs common to at least two of the Production Managers, and the two Directors (D1 = Managing Director, D2 = Operations Director).

Table 8.1.1: Mental Map Distance Results

	<i>SMM</i>	<i>SMM2</i>	<i>D11</i>	<i>D12</i>	<i>D21</i>	<i>D22</i>	<i>M11</i>	<i>M12</i>	<i>M21</i>	<i>M22</i>	<i>M31</i>	<i>M32</i>
<i>SMM</i>	0.000											
<i>SMM2</i>	0.400	0.000										
<i>D11</i>	0.430	0.593	0.000									
<i>D12</i>	0.601	0.504	0.450	0.000								
<i>D21</i>	0.468	0.571	0.472	0.532	0.000							
<i>D22</i>	0.648	0.606	0.472	0.418	0.451	0.000						
<i>M11</i>	0.297	0.490	0.456	0.596	0.436	0.600	0.000					
<i>M12</i>	0.616	0.283	0.655	0.556	0.513	0.624	0.520	0.000				
<i>M21</i>	0.257	0.450	0.480	0.632	0.473	0.673	0.396	0.502	0.000			
<i>M22</i>	0.461	0.311	0.498	0.527	0.588	0.559	0.492	0.499	0.420	0.000		
<i>M31</i>	0.316	0.481	0.510	0.711	0.481	0.668	0.484	0.572	0.419	0.510	0.000	
<i>M32</i>	0.386	0.256	0.508	0.536	0.542	0.542	0.409	0.406	0.433	0.439	0.403	0.000

Key:

<i>SMM</i>	Shared Mental Map (1st Interview)	<i>M11</i>	Production manager 1 (1st Interview)
<i>SMM 2</i>	Shared Mental Map (2nd Interview)	<i>M12</i>	Production manager 1 (2nd Interview)
<i>D11</i>	Managing director (1st Interview)	<i>M21</i>	Production manager 2 (1st Interview)
<i>D12</i>	Managing director (2nd Interview)	<i>M22</i>	Production manager 2 (2nd Interview)
<i>D21</i>	Operations director (1st Interview)	<i>M31</i>	Production manager 3 (1st Interview)
<i>D22</i>	Operations director (2 nd interview)	<i>M32</i>	Production manager 3 (2nd Interview)

8.1.3 Convergence or Divergence of Mental Maps from the Directors

Table 8.1.2: Mental Map Change Over the Interview Phases

Director 1

	<i>Distance difference between interviews / Distance from SM at 1st interview x 100</i>		
	<i>1st Interview</i>	<i>2nd Interview</i>	
<i>SMM</i>	0.430	0.504	17% Divergence
<i>M1</i>	0.456	0.556	22% Divergence
<i>M2</i>	0.480	0.527	5% Divergence
<i>M3</i>	0.510	0.536	3% Divergence

Director 2

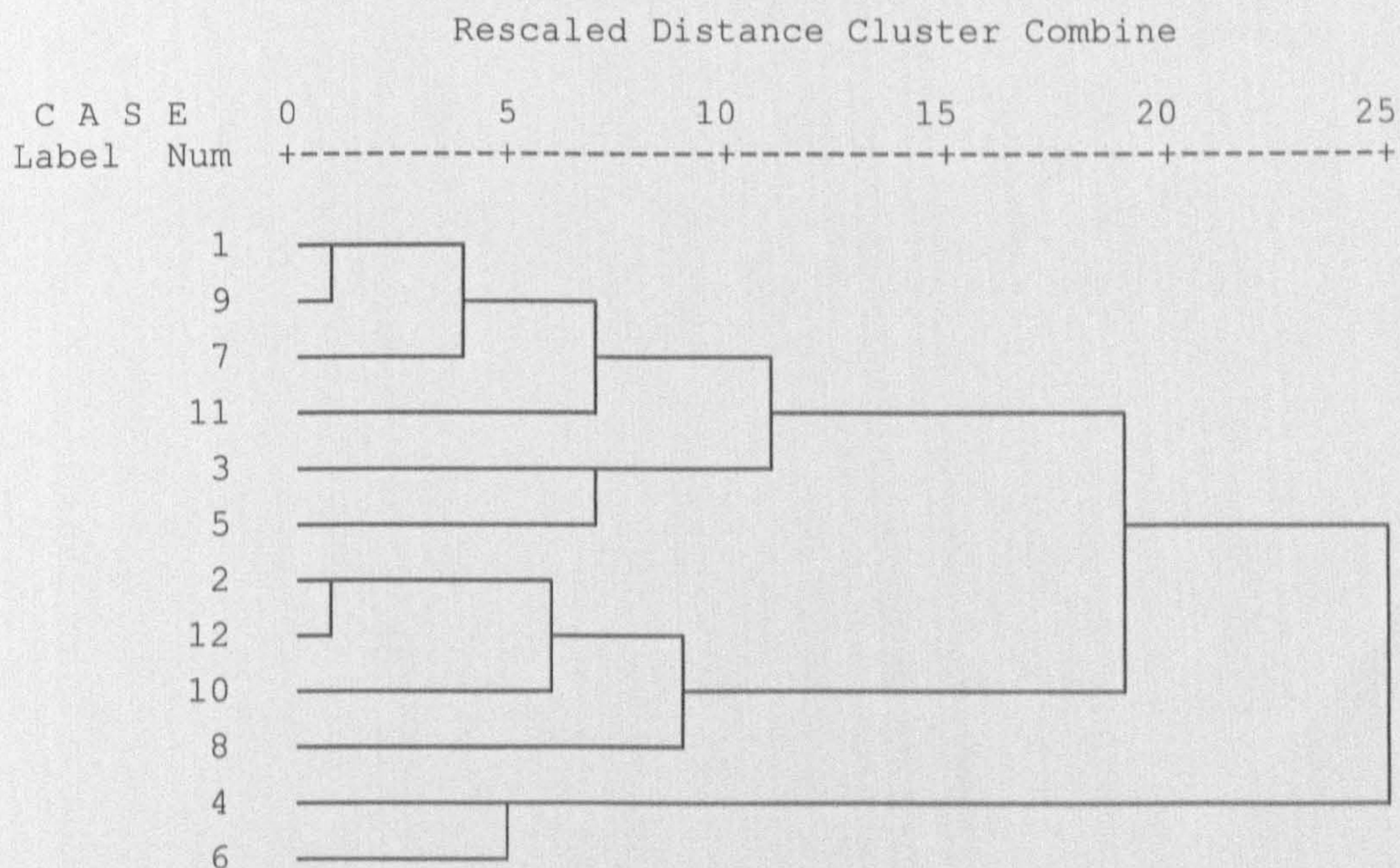
	<i>Distance difference between interviews / Distance from SM at 1st interview x 100</i>		
	<i>1st Interview</i>	<i>2nd Interview</i>	
<i>SMM</i>	0.468	0.606	29% Divergence
<i>M1</i>	0.436	0.624	43% Divergence
<i>M2</i>	0.473	0.559	18% Divergence
<i>M3</i>	0.481	0.542	13% Divergence

8.1.4 Mental Map Proximities: Multi-dimensional scaling and Hierarchical cluster analysis

Table 8.1.3: Hierarchical Cluster Analysis Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	SMM	M21	.176	0	0	3
2	SMM2	M32	.189	0	0	5
3	SMM	M11	.336	1	0	7
4	D12	D22	.378	0	0	11
5	SMM2	M22	.424	2	0	8
6	D11	D21	.485	0	0	9
7	SMM	M31	.495	3	0	9
8	SMM2	M12	.571	5	0	10
9	SMM	D11	.675	7	6	10
10	SMM	SMM2	1.044	9	8	11
11	SMM	D12	1.341	10	4	0

Dendrogram using Complete Linkage

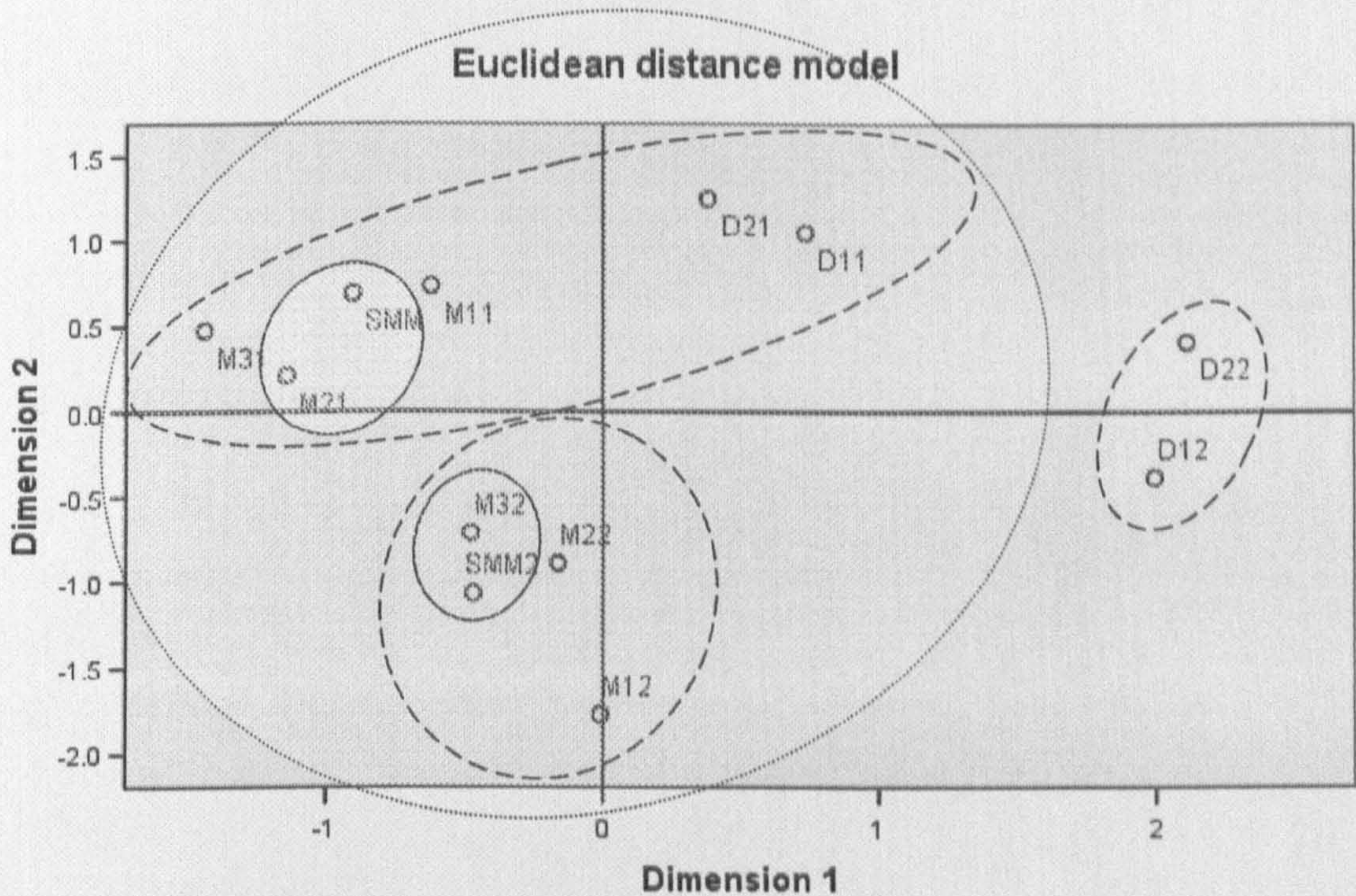


Key:

Case	Case	Case	Case
1	SMM	4	D12
2	SMM2	5	D21
3	D11	6	D22
7	M11	10	M22
8	M12	11	M31
9	M21	12	M32

Figure 8.1.1: Hierarchical Cluster Analysis Dendrogram

Derived Stimulus Configuration



Cluster agglomeration key:

- 1. Strong association —————
- 2. Moderate association -----
- 3. Weak association

Fig 8.1.2: MDS and HCA of Mental Maps

The MDS and HCA of the distance results reveal the key relationships. A notable result was the clustering of the two Directors. For this study, access was gained to two Directors which provided a potentially more accurate understanding of the top managers' thinking in comparison to using one top manager, who may have relatively idiosyncratic views. At both interviews, the mental maps of the Directors cluster together, displaying similar mental maps of how the production department can contribute to the improved performance of the company. At interview 1, HCA reveals the Directors have a moderate association with the three Production Managers and so

similar mental maps. However, by interview 2, the Directors develop their own cluster that endures until the final agglomeration. This indicates that the Directors at the second interview have a less than weak association with the three Production Managers at either the second interview, or the first. The Directors have changed significantly in their mental models of how the production department can contribute to organisational performance improvement by the second interview. However, the Production Managers have not changed their mental models to include those concepts held by the Directors at this stage. There is an evident disparity in Director and Production Manager thinking regarding how the production department can contribute to the improved performance of the company. A further notable result was the cohesion of the Production Managers' mental maps. Two identifiable clusters emerge corresponding to each interview stage. The three Production Managers display a moderate association at the first interview and then form a separate cluster by interview 2, also showing a moderate association between the three Managers. The implication was that the three Production Managers have altered their mental models by the second interview by incorporating similar concepts across the team, however, these concepts differ from the Directors. Finally, the SMM provides further validation of the similarity in the thinking of the Production Managers. The proximity and association of the SMM with the Production Managers' mental maps reveals that all three of the Managers are contributing to the SMM reasonably evenly. If, for example, one of the Production Manager's held idiosyncratic ideas, the analysis would capture this in terms of a greater proximity to the other two managers and the SMM, and the inclusion into a different cluster (see study A, Figure 7.1.2, Manager 1 at the second interview as an example of this).

8.1.5 Organisational Learning of Study B

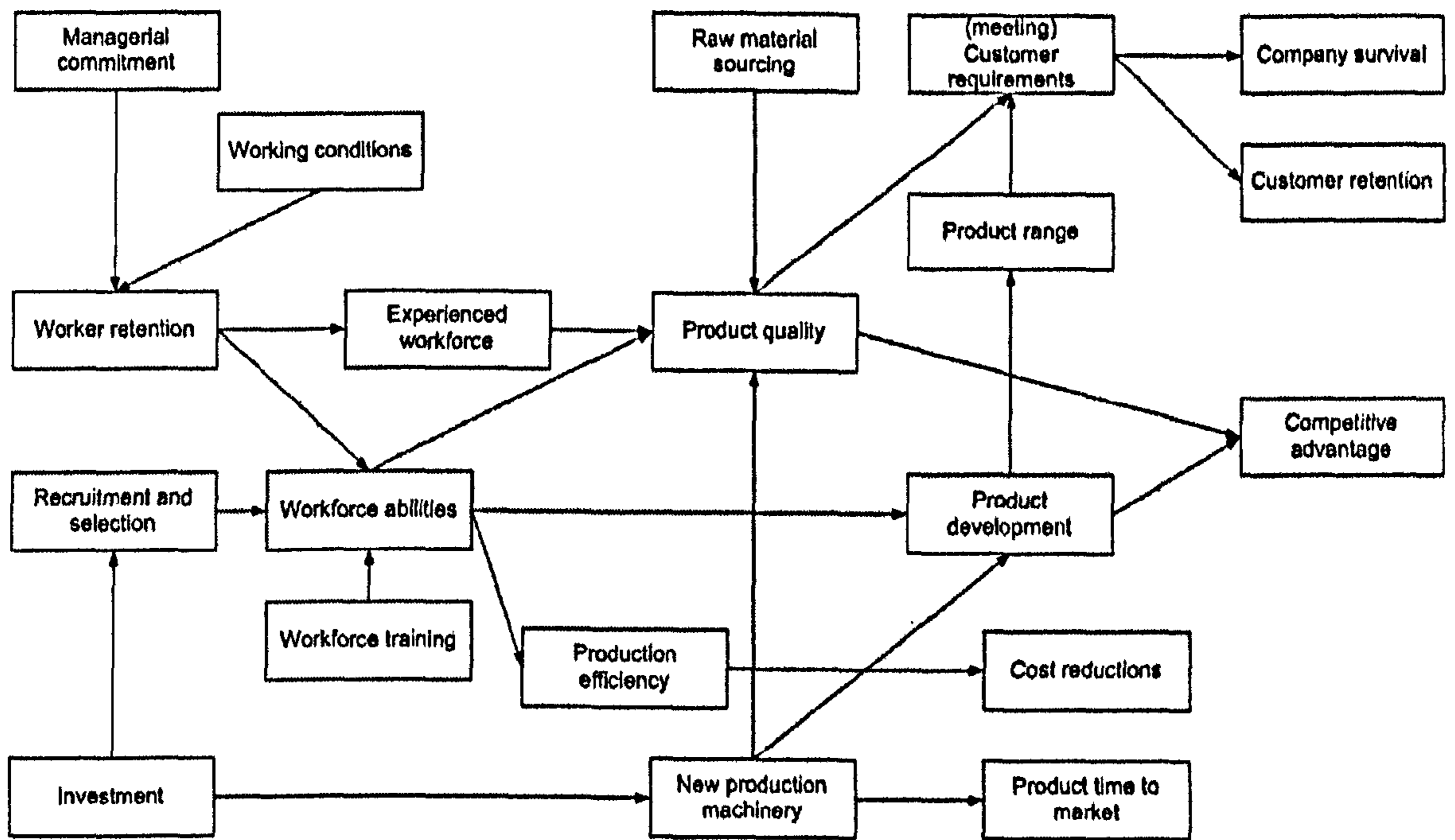


Figure 8.1.3: Shared Mental Map at 1st Interview

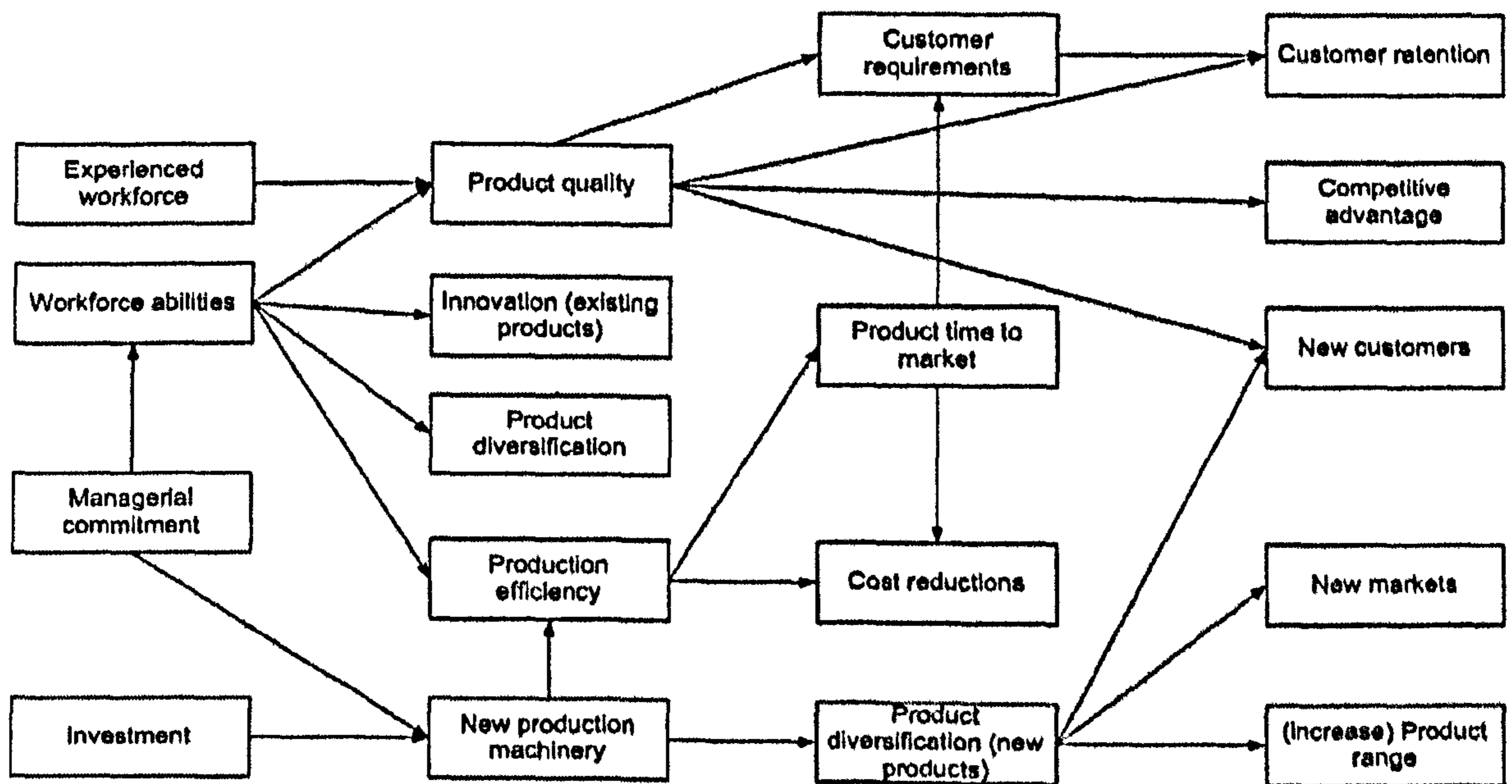


Figure 8.1.4: Shared Mental Map at 2nd Interview

8.1.6 Shared Mental Model Standard Causal Unit Ownership

Table 8.1.4: SMM SCU Ownership at Interview 1

SMM Standard Causal Units		Inclusion in Individual Mental Maps			D1	D2
Cause	Effect	M1	M2	M3		
Customer requirements	Customer retention	Yes	Yes	Yes	Yes	Yes
Customer requirements	Company survival	Yes	Yes	No	Yes	Yes
Experienced workforce	Product quality	Yes	Yes	Yes	No	Yes
Workforce T&D	Workforce abilities	Yes	Yes	Yes	Yes	No
Workforce conditions	Worker retention	No	Yes	Yes	No	No
Workforce abilities	Product development	No	Yes	Yes	No	No
Workforce abilities	Production efficiency	Yes	Yes	No	Yes	No
Workforce abilities	Product quality	No	Yes	Yes	Yes	No
Worker retention	Experienced workforce	Yes	No	Yes	Yes	Yes
Worker retention	Workforce abilities	Yes	Yes	Yes	Yes	No
Recruitment and selection	Workforce abilities	Yes	Yes	No	Yes	No
Product development	Product range	No	Yes	Yes	No	No
Product development	Competitive advantage	Yes	Yes	No	No	Yes
Investment	Recruitment and selection	Yes	Yes	No	No	No
Investment	New production machinery	Yes	Yes	No	No	No
New production machinery	Product development	Yes	Yes	No	No	Yes
New production machinery	Product quality	Yes	Yes	Yes	No	No
New production machinery	Product time to market	Yes	Yes	No	No	No
Production efficiency	Cost reductions	Yes	Yes	Yes	Yes	Yes
Managerial commitment	Worker retention	No	Yes	Yes	No	No
Raw material sourcing	Product quality	Yes	No	Yes	No	No
Product quality	Customer requirements	Yes	No	Yes	Yes	Yes
Product quality	Competitive advantage	Yes	Yes	Yes	No	Yes
Product range	Customer requirements	No	Yes	Yes	No	Yes
Total	24	18	21	16	10	10
Total individual SCUs		59	65	54	64	76

Table 8.1.5: SMM SCU Ownership at Interview 2

SMM Standard Causal Units		Inclusion in Individual Mental Maps			<i>D1</i>	<i>D2</i>
Cause	Effect	M1	M2	M3		
Customer requirements	Customer retention	No	Yes	Yes	<i>Yes</i>	<i>Yes</i>
Experienced workforce	Product quality	Yes	No	Yes	<i>No</i>	<i>No</i>
Workforce abilities	Product diversification	Yes	No	Yes	<i>Yes</i>	<i>No</i>
Workforce abilities	Innovation	Yes	No	Yes	<i>Yes</i>	<i>No</i>
Workforce abilities	Production efficiency	No	Yes	Yes	<i>Yes</i>	<i>Yes</i>
Workforce abilities	Product quality	No	Yes	Yes	<i>No</i>	<i>No</i>
Product diversification	New customers	Yes	No	Yes	<i>No</i>	<i>Yes</i>
Product diversification	New markets	Yes	Yes	Yes	<i>Yes</i>	<i>Yes</i>
Product diversification	Product range	Yes	Yes	No	<i>Yes</i>	<i>No</i>
Investment	New production machinery	Yes	Yes	No	<i>No</i>	<i>No</i>
New production machinery	Product diversification	Yes	Yes	Yes	<i>Yes</i>	<i>No</i>
New production machinery	Production efficiency	Yes	No	Yes	<i>No</i>	<i>No</i>
Production efficiency	Cost reductions	No	Yes	Yes	<i>Yes</i>	<i>Yes</i>
Production efficiency	Product time to market	Yes	Yes	No	<i>No</i>	<i>No</i>
Managerial commitment	Workforce abilities	Yes	No	Yes	<i>No</i>	<i>No</i>
Managerial commitment	New production machinery	Yes	No	Yes	<i>No</i>	<i>No</i>
Product quality	Customer retention	Yes	Yes	Yes	<i>No</i>	<i>No</i>
Product quality	New customers	Yes	No	Yes	<i>No</i>	<i>No</i>
Product quality	Customer requirements	Yes	Yes	Yes	<i>No</i>	<i>No</i>
Product quality	Competitive advantage	Yes	Yes	Yes	<i>No</i>	<i>No</i>
Product time to market	Customer requirements	No	Yes	Yes	<i>No</i>	<i>No</i>
Product time to market	Cost reductions	No	Yes	Yes	<i>No</i>	<i>No</i>
Total	22	16	14	19	8	5
Total individual SCUs		45	42	52	69	76

8.1.7 Complexity of Maps

Table 8.1.6: Complexity of the SMM

	Shared SCUs	Total SCUs	%
1 st interview	24	178	13
2 nd interview	22	139	16
<i>Difference</i>			<i>19% increase</i>

8.1.8 Directors' cognitive centrality

Table 8.1.7: Directors' cognitive centrality

Managing Director's (D1) cognitive centrality

	<i>1st Interview</i>	<i>tf</i>	<i>2nd Interview</i>	<i>tf</i>
1	(Meeting) Customer requirements	14	Product diversification	13
2	Workforce flexibility (task)	9	Cost reductions	11
3	Workforce abilities	9	Innovation	9
4	Cost leadership	8	Workforce abilities	8
5	Production efficiency	6	Continuous improvement	8

Operations Director's (D2) cognitive centrality

	<i>1st Interview</i>	<i>tf</i>	<i>2nd Interview</i>	<i>tf</i>
1	(Meeting) Customer requirements	20	Product diversification	15
2	Product development	14	Continuous improvement	10
3	Cost reductions	11	Production efficiency	9
4	Product differentiation	10	Customer retention	9
5	Customer retention	10	Cost leadership/Customer relationships	8

8.2 DISCUSSION OF ORGANISATION B

8.2.1 Interview 1

The distance results of the Production Managers and the SMM in rank order with the two Directors (whom, the analysis revealed, had similar mental maps) at the first interview stage are presented in Table 8.2.1.

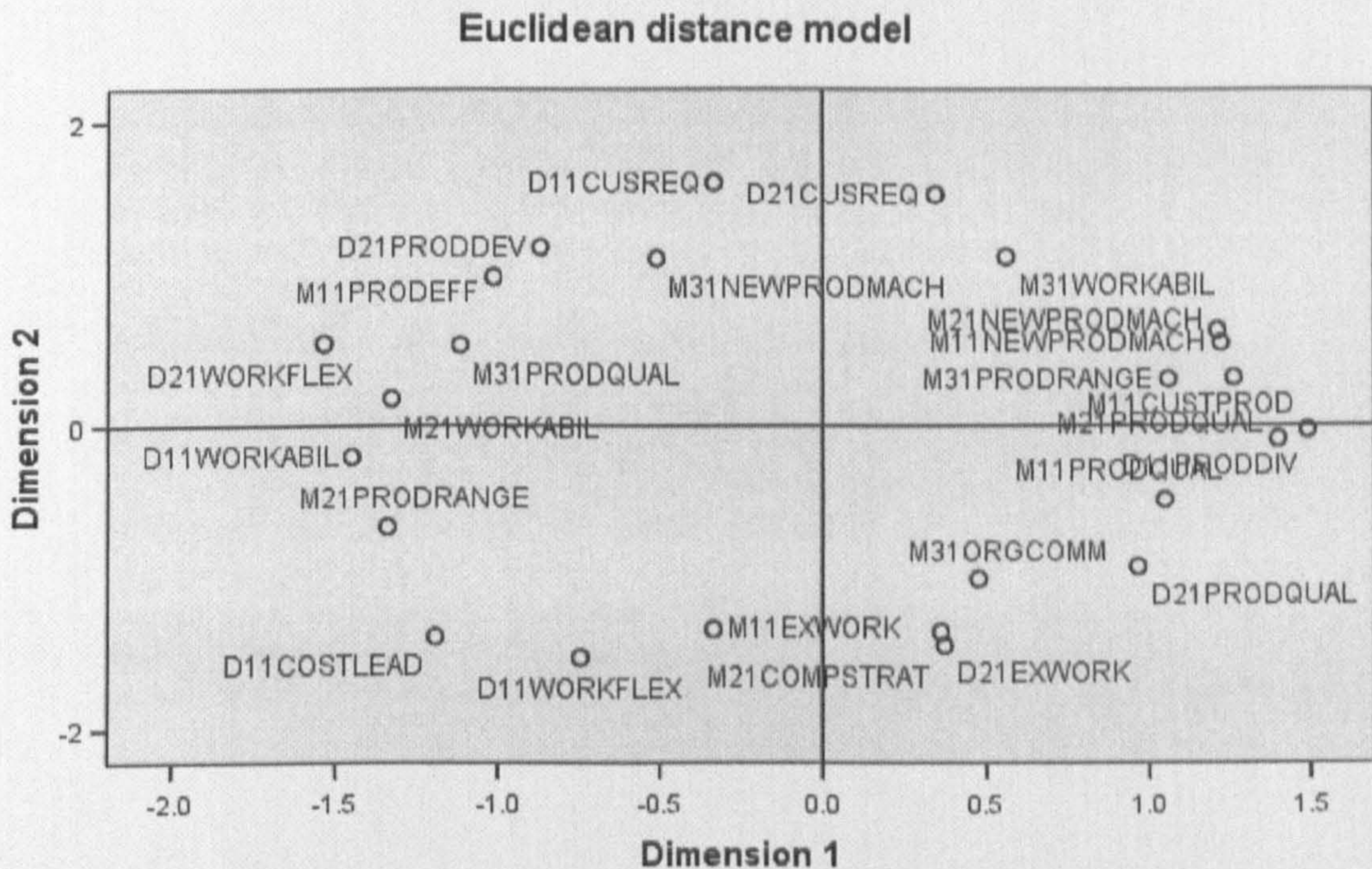
Table 8.2.1: Ranked Distance Results at Interview 1

<i>Ranking: Similarity to Director 1</i>		<i>Distance from Senior Manager Mental Map</i>
1	Shared Mental Map	0.430
2	Production manager 1	0.456
3	Production manager 2	0.480
4	Production manager 3	0.510

<i>Ranking: Similarity to Director 2</i>		<i>Distance from Senior Manager Mental Map</i>
1	Production manager 1	0.436
2	Shared Mental Map	0.468
3	Production manager 2	0.473
4	Production manager 3	0.481

These rankings demonstrate that the SMM is the most similar to Director 1, Manager 1 to Director 2 and Manager 3 the most dissimilar to both managers. However, it is noticeable how close these distance figures are between the managers (compare, for example, with study A at interview 1 that displayed distance results ranging from 0.525 to 0.722) and this cohesion was supported and illustrated by the MDS and HCA analysis. The results and analysis also show that the Directors' mental maps identifiably differ from the Production Managers at this stage, but there was a moderate association. MDS of the Directors' and Production Managers' anchor themes provide an indication of the points of similarity and dissimilarity:

Derived Stimulus Configuration



Key:

<i>Abbreviated anchor theme</i>	<i>Full anchor theme</i>	<i>Abbreviated anchor theme</i>	<i>Full anchor theme</i>
CUSREQ	Customer requirements	EXWORK	Experienced workforce
COSTLEAD	Cost leadership	PRODQUAL	Product quality
PRODDIV	Product diversification	PRODEFF	Production efficiency
WORKABIL	Workforce abilities	NEWPRDGMACH	New production machinery
COMPSTRAT	Company strategies	ORGCMM	Organisational communication
WORKFLEX	Workforce general flexibility	CUSTPROD	Customised products
PRODDEV	Product development	PRODRANGE	Product range

Fig 8.2.1: Anchor Theme MDS at Interview 1

Figure 8.2.1 reveals a cluster in the top right hand quadrant that is predominantly populated by the Production Manager's and anchor themes such as new production machinery, product range, product quality. This demonstrates similarities between the Managers and where the dissimilarities to the Directors predominantly lie. The remaining quadrants do not display any obvious groupings, are relatively uniform in

their proximities, and have a mix of Directors/Production Managers and themes, therefore, no obvious differences or strong similarities. For this reason there was a moderate association at this stage.

8.2.2 *The formation of the shared mental map at interview 1*

The distance rankings disclosed that the SMM was the most similar to Director 1 and second, behind Manager 1, to Director 2. HCA shows that Manager 2 clusters the closest to the SMM, marginally closer than Managers 3 and 1. The SMM SCU ownership further supports that the SMM has formed reasonably evenly from the three managers rather than being heavily influenced by an individual or two individuals. The Directors both contain 10 of the SCUs in the SMM within their own mental maps revealing that although there are differences, there are also similarities and this was supported in the analysis.

8.2.3 *Interview 2*

The distance results of the Production Manager's and the SMM in rank order with the two Directors at this stage are presented in Table 8.2.2:

Table 8.2.2: Ranked Distance Results at the 2nd Interview

<i>Ranking: Similarity to Director 1</i>		<i>Distance from Director Mental Map</i>
1	Shared Mental Map	0.504
2	Production manager 2	0.527
3	Production manager 3	0.536
4	Production manager 1	0.556

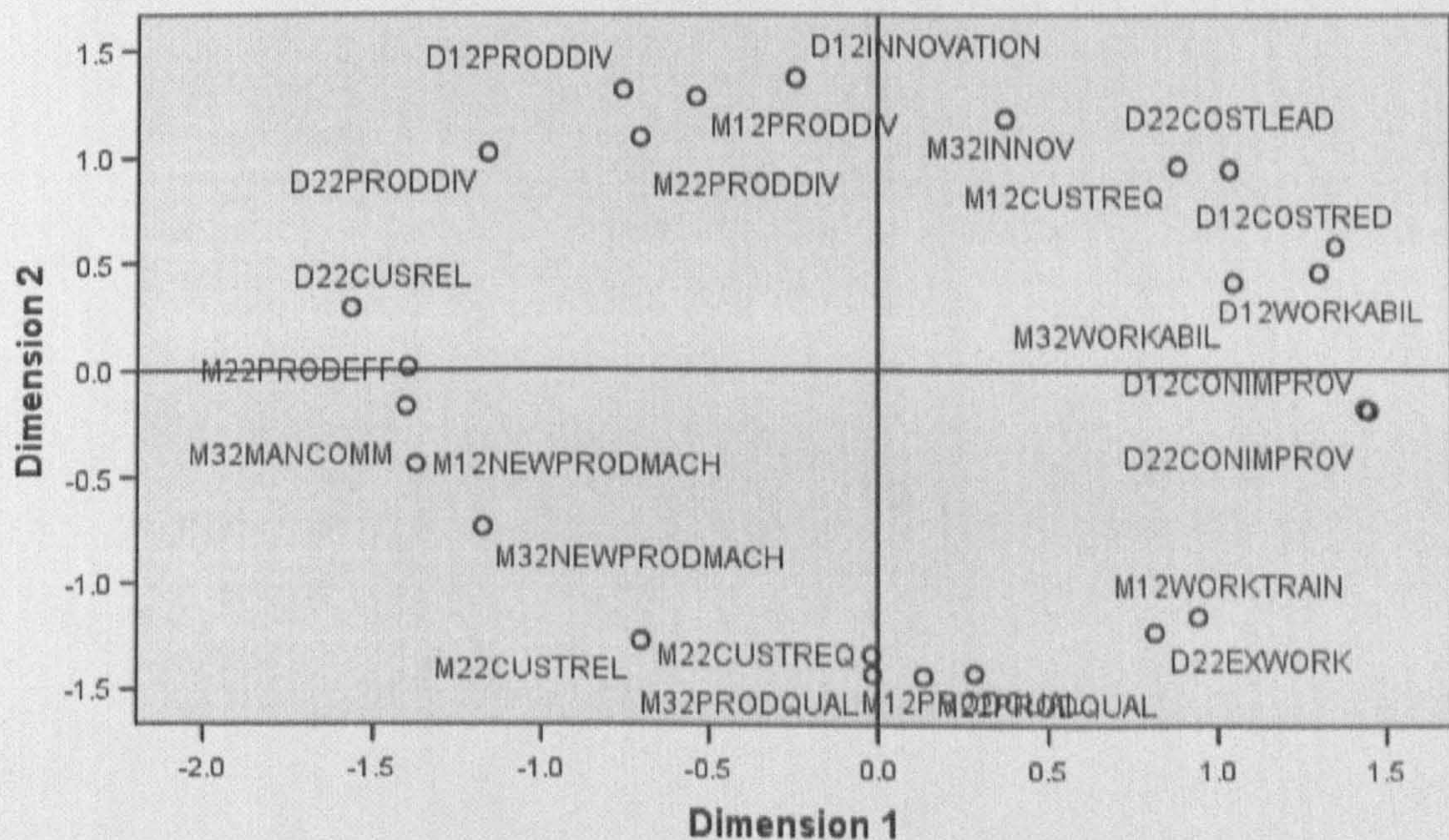
<i>Ranking: Similarity to Director 2</i>		<i>Distance from Director Mental Map</i>
1	Production manager 3	0.542
2	Production manager 2	0.559
3	Shared Mental Map	0.606
4	Production manager 1	0.624

Once again the distance results, supported by the MDS and HCA analysis, reveal similar mental maps regarding the production department's contribution to organisational performance improvement across the management team. The SMM is the closest to the mental map of Director 1, Manager 3 is the closest to Director 2 and Manager 1 is the most dissimilar to both managers. The analysis also exposed that the Directors clustered closely together as in interview 1, however, unlike the first interview they form a distinct cluster that does not display even a weak association with the Production Managers cluster. The implication was that the thinking of the Production Managers and Directors became significantly more distinct by the second interview.

The anchor theme MDS analysis provides an indication of where these differences lie, as depicted in Figure 8.2.2:

Derived Stimulus Configuration

Euclidean distance model



Key:

<i>Abbreviated anchor theme</i>	<i>Full anchor theme</i>	<i>Abbreviated anchor theme</i>	<i>Full anchor theme</i>
PRODDIV	Product diversification	PRODEFF	Production efficiency
INNOV	Innovation	MANCOMM	Management communication
CUSTREQ	Customer requirements	NEWPRODMACH	New production machinery
COSTLEAD	Cost leadership	CONIMPROV	Continuous improvement
CUSREL	Customer relationships	WORKTRAIN	Workforce training
WORKABIL	Workforce ability	EXWORK	Experienced workforce
PRODQUAL	Product quality	COSTRED	Cost reduction

Figure 8.2.2: Anchor Theme MDS at Interview 2

What was most evident from the anchor theme analysis was the dispersion of the anchor theme mental maps in comparison to the anchor theme analysis at interview 1 (Figure 8.2.1). The distance between the points has increased and was evidenced by a closer proximity to the outer edges of the diagram and there are no clearly identifiable clusters. These results are indicative of a wider variation of concepts. The bottom, left hand quadrant is populated entirely by the Production Managers and demonstrates that the causes and effects of the anchor themes production efficiency, new production machinery, management communication, customer relationships, customer requirements, and product quality are particularly distinct from the Directors. The Directors' cognitive centrality (Table 8.1.8) indicated that product diversification was the most important concept for how the Production Department can contribute to organisational performance improvement according to both Directors. The anchor theme analysis (Figure 8.2.1) reveals that these mental maps are relatively isolated in the top, left hand quadrant. Although Production Managers 1 and 2 have both identified product diversification as an anchor theme and these points lie in the same quadrant, the lack of any grouping means that product diversification and the causes and effects was not a theme that appeared significantly in any of the other anchor theme mental maps.

Therefore, the cognitive centrality results recognise product diversification as being the most important concept for the Directors, yet the anchor theme MDS analysis reveals that this factor, and the related causes and effects, are not a major concept in the mental models of the Production Manager's. These results reveal a significant cause of the difference identified in the mental maps of the Director's and Production Manager's at the second interview.

8.2.4 *The formation of the shared mental map at interview 2*

The distance rankings reveal that the SMM was the most similar to Director 1 and third, behind managers 3 and 2, to Director 2. However, as with the first interview the analysis has revealed a distinct similarity among the three Production Managers' mental maps and consequently the formation and content of the SMM was not being heavily influenced by an individual or individuals.

8.2.5 *Change over the interview period: Individual learning*

Table 8.2.3: Ranked Mental Map Change Over the Interview Phases

Director 1

Distance difference between interviews / Distance from Director at 1st interview x 100

Rank		1st Interview	2nd Interview	
1	M3	0.510	0.536	3% Divergence
2	M2	0.480	0.527	5% Divergence
3	SMM	0.430	0.504	17% Divergence
4	M1	0.456	0.556	22% Divergence

Director 2

Rank		1st Interview	2nd Interview	
1	M3	0.481	0.542	13% Divergence
2	M2	0.473	0.559	18% Divergence
3	SMM	0.468	0.606	29% Divergence
4	M1	0.436	0.624	43% Divergence

The individual mental map change revealed that all three Production Managers had diverged from both of the Directors' mental maps at the second interview. A difference had emerged regarding what the key factors were for the Production Department to be able to contribute to organisational performance improvement. The MDS and HCA analysis showed that the major change over the two interviews was the Directors' mental maps moving away from the Production Managers. The analysis identified that product diversification was paramount in the thinking of the Directors at the second interview, after not appearing at all in the cognitive centrality results at the first interview. This change was a significant cause of the difference as product diversification and the causes and effects were not a major factor in any of the individual Managers' mental maps at the second interview. The rankings in Table 8.2.3 show that Manager 3 had diverged from the mental maps of the Directors the least of the three Production Managers at interview 2, whereas Manager 1 displayed the greatest divergence.

8.2.6 Organisational learning

The SMM ranks 3rd with respect to the individual Managers in terms of its divergence from the Directors' mental maps at the second interview. By focusing on the content and ownership of the SMM and how this changed over the interviews, an indication of the OL process can be gained. What was particularly noticeable was that at both interviews the ownership of the concepts included in the SMM was relatively even across the three Production Managers. This indicated that no individual (or individuals) are disproportionately influencing the mental map at either interview stage. It was the Directors' mental maps that move away from the SMM over the course of the interviews. In this case, the Production Managers have similar mental models regarding

how the production department can contribute to an improvement in the organisations performance at the first interview. The thinking does then alter (to a lesser degree than the Directors) by the second interview, but again, the new thinking was similar across the Production Managers. The SMM is not developing significantly differently to any of the individuals because of the similarity in thinking across the management team.

8.2.7 Higher and lower level learning

The analysis particularly exposed the change in the Directors' mental maps over the two interviews. New concepts, for example product diversification, appear as key factors at the second interview. This follows the reasoning of higher order learning being associated with new understandings and so the Directors' learning could potentially be identified as higher level. Although both individual managers learning and organisational learning (SMM) display noticeable differences at the two interviews and develop into identifiable clusters, the contrast was not as stark as that of the Directors. This brings to light the issue of subjectivity when identifying higher or lower-level learning as the situation for the Production Managers and the SMM was more difficult to attribute as higher or lower-level learning.

CHAPTER 9

9. Organisation C: Results, Analysis and Discussion

9.1 ORGANISATION C: RESULTS AND ANALYSIS

9.1.1 *Elicited data for comparison*

The top management for this study were represented by the Learning Resources Director (LRD) and the sales department was represented by three Sales Managers (SM) who report to the LRD. One Sales Manager was the researcher's contact and the other two were selected according to availability. The participants were interviewed twice, with a period of approximately 12 months between interviews. Chapter 6 outlined the method of the interviews and Appendix D includes the raw data sheets from the interviews. A total of 40 causal cognitive maps were elicited consisting of 539 Natural Language Units which were compressed into 99 Standard Terms, resulting in 391 Standard Causal Units.

9.1.2 *Distance Results*

Table 9.1.1 shows the distance results of the mental maps elicited at the two interview phases for the three Sales Managers (M1-M3), the shared mental map (SMM) which is an aggregation of the SCUs common to at least two of the Sales Managers, and the Learning Resources Director (D).

Table 9.1.1: Mental Map Distance Results

	SMM1	SMM2	D1	D2	M11	M12	M21	M22	M31	M32
SMM1	0.000									
SMM2	0.803	0.000								
D11	1.000	0.537	0.000							
D12	0.686	0.758	0.664	0.000						
M11	0.629	0.690	0.855	0.673	0.000					
M12	1.000	0.406	0.565	0.639	0.577	0.000				
M21	0.377	0.737	0.643	0.558	0.767	0.855	0.000			
M22	0.751	0.306	0.536	0.779	0.635	0.513	0.586	0.000		
M31	0.391	0.585	0.764	0.668	0.712	0.669	0.492	0.628	0.000	
M32	0.545	0.354	0.620	0.602	0.716	0.603	0.551	0.469	0.367	0.000

Key:

<i>SMM</i>	Shared Mental Map (1st Interview)	<i>M12</i>	Sales manager 1 (2nd Interview)
<i>SMM2</i>	Shared Mental Map (2nd Interview)	<i>M21</i>	Sales manager 2 (1st Interview)
<i>D11</i>	Learning resources director (1st Interview)	<i>M22</i>	Sales manager 2 (2nd Interview)
<i>D12</i>	Learning resources director (2nd Interview)	<i>M31</i>	Sales manager 3 (1st Interview)
<i>M11</i>	Sales manager 1 (1st Interview)	<i>M32</i>	Sales manager 3 (2nd Interview)

9.1.3 Convergence or divergence of mental maps from the senior manager

Table 9.1.2: Mental Map Change Over the Interview Phases

Percentage convergence or divergence of mental maps from director:

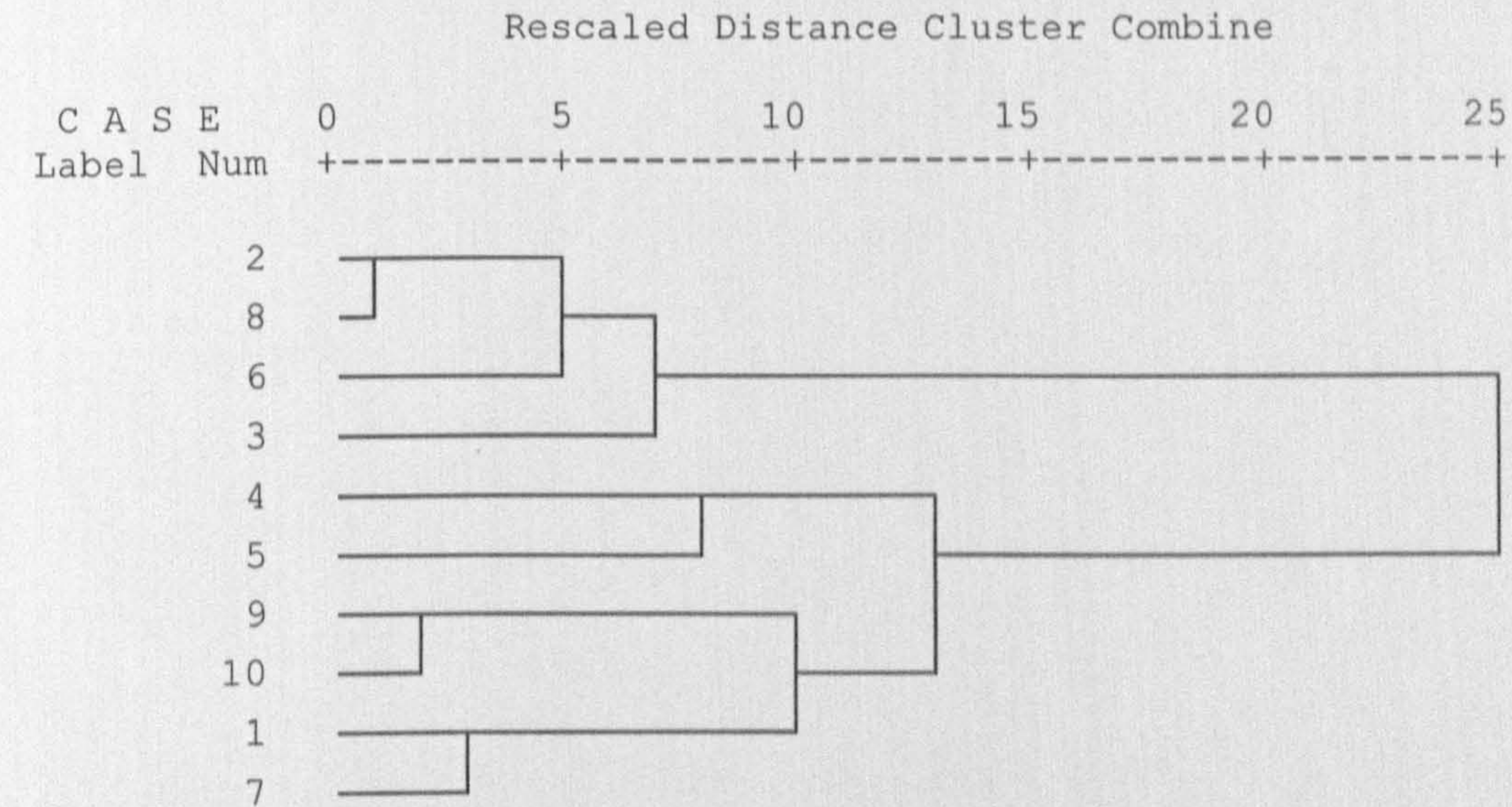
	<i>Distance difference between interviews / Distance from LRD at 1st interview x 100</i>		
	<i>1st Interview</i>	<i>2nd Interview</i>	
<i>SMM</i>	1.000	0.758	24% Convergence
<i>M1</i>	0.855	0.639	25% Convergence
<i>M2</i>	0.643	0.779	21% Divergence
<i>M3</i>	0.764	0.602	21% Convergence

9.1.4 Mental Map Proximities: Multi-dimensional scaling and Hierarchical cluster analysis

Table 9.1.3: Hierarchical Cluster Analysis Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	SMM2	M22	.243	0	0	4
2	M31	M32	.405	0	0	7
3	SMM1	M21	.510	0	0	7
4	SMM2	M12	.714	1	0	5
5	SMM2	D1	.841	4	0	9
6	D2	M11	1.033	0	0	8
7	SMM1	M31	1.223	3	2	8
8	SMM1	D2	1.456	7	6	9
9	SMM1	SMM2	2.718	8	5	0

Dendrogram using Complete Linkage

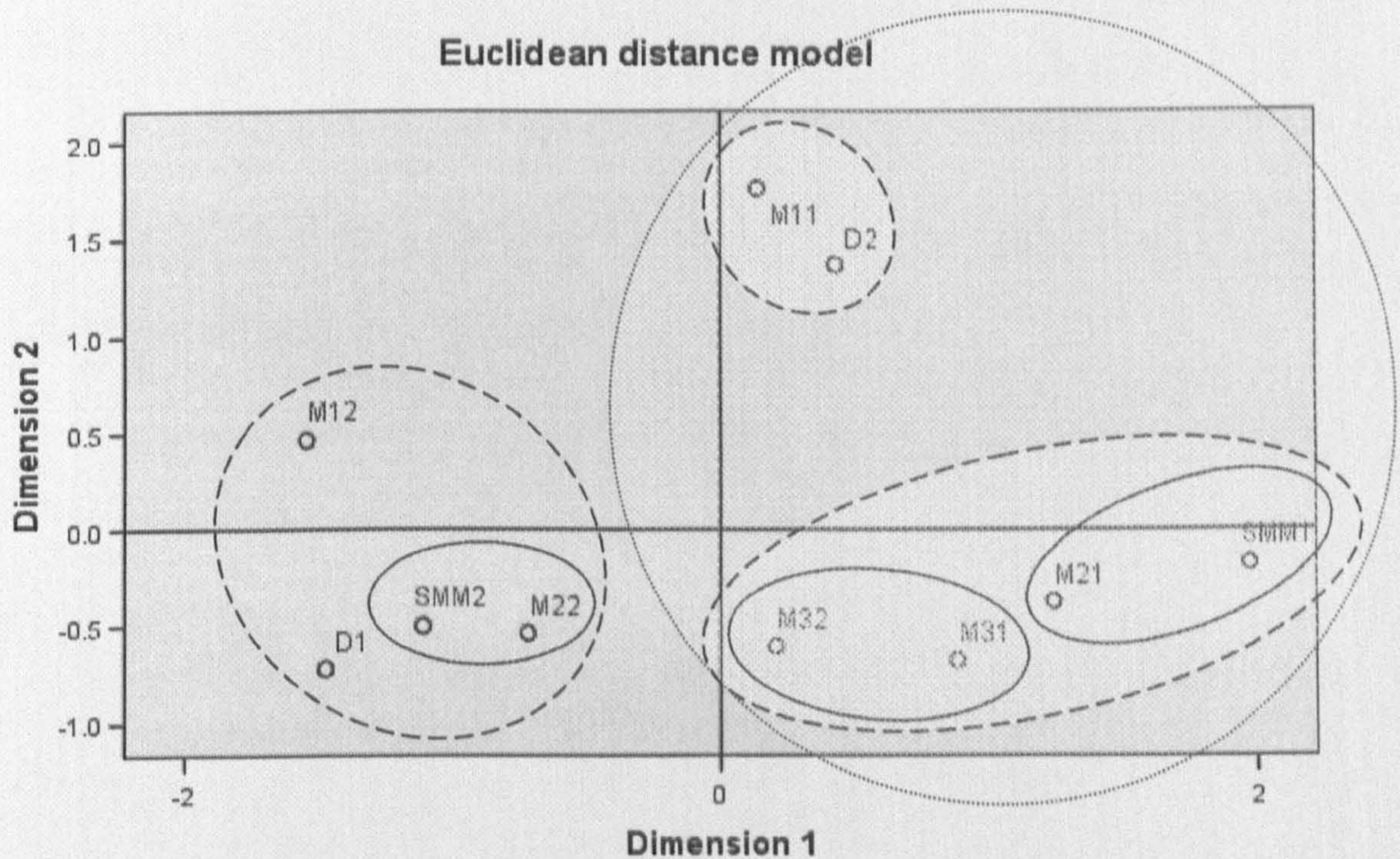


Key:

Case	Case	Case	Case	Case
1 SMM1	3 D1	5 M11	7 M21	9 M31
2 SMM2	4 D2	6 M12	8 M22	10 M32

Fig 9.1.1: Hierarchical Cluster Analysis Dendrogram

Derived Stimulus Configuration



Cluster agglomeration key:

1. Strong association _____
2. Moderate association - - - - -
3. Weak association

Figure 9.1.2: MDS and Hierarchical Cluster Analysis of Mental Maps

The mental maps of Manager 3 derived from the two interviews display a strong association. The inference was that the concepts elicited from Manager 3 regarding how the sales department can contribute to organisational performance improvement were similar at both interviews. The mental maps of Manager 2 derived from the two interviews cluster separately and show less than a weak association demonstrating a significant change at the second interview. Similarly, the cluster separation and less than weak association is also evident for Manager 1, the Director and the SMM. It was also established that the mental map of Manager 1 at the second interview was

moderately associated with the mental map of the Director at the first interview. The mental map of Manager 2 at the second interview is also moderately associated with the mental map of the Director at the first interview. These results highlight the fact that the Sales Managers have changed their mental models by the second interview to become more aligned with the mental models of the Director at the first interview. However, by this time the mental model of the Director has moved on to include new concepts. It was also demonstrated that the mental map of Manager 1 at the first interview is moderately associated with the Director's mental map at the second interview which may indicate that the Director has learnt concepts of organisational performance improvement from the ideas that Manager 1 held.

9.1.5 Organisational Learning of Study C

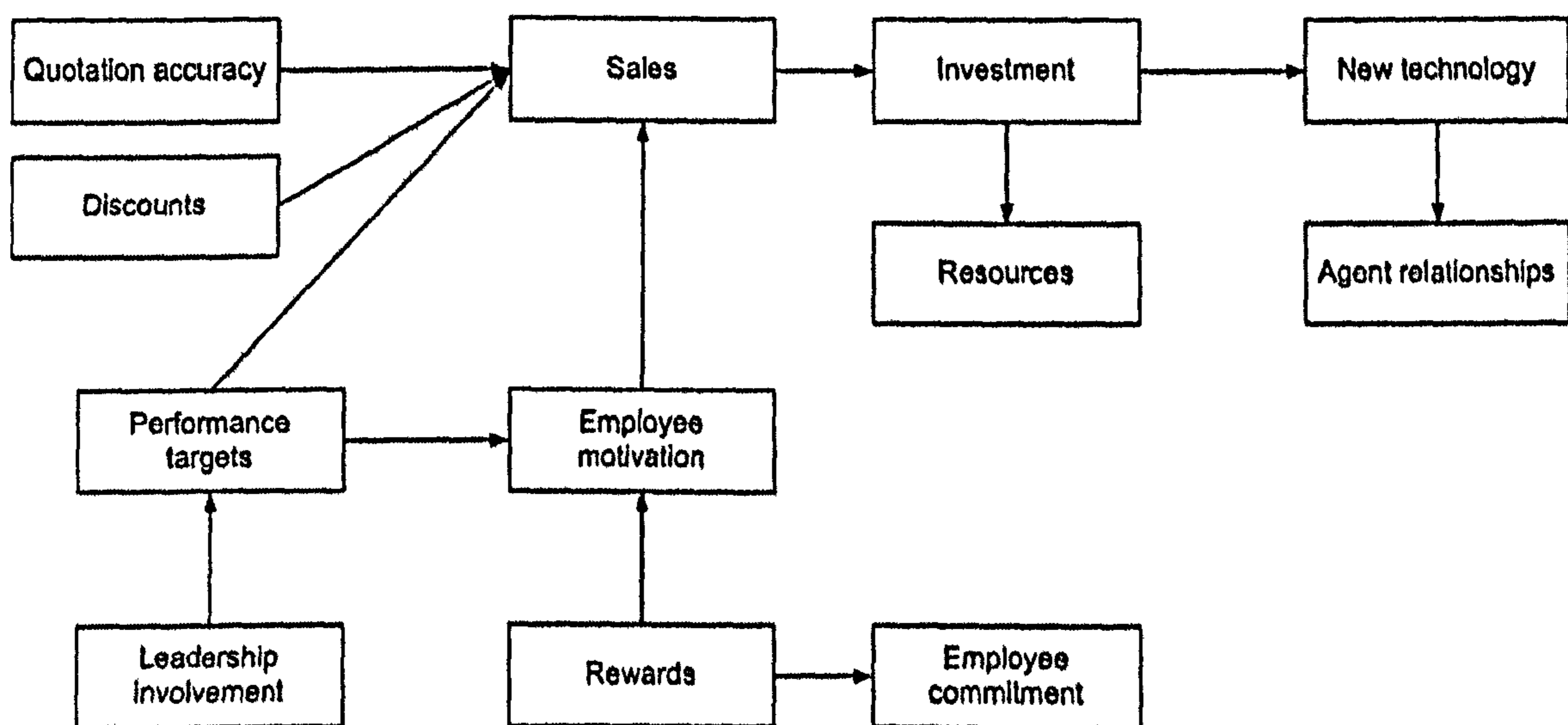


Figure 9.1.3: Shared Mental Map at 1st Interview

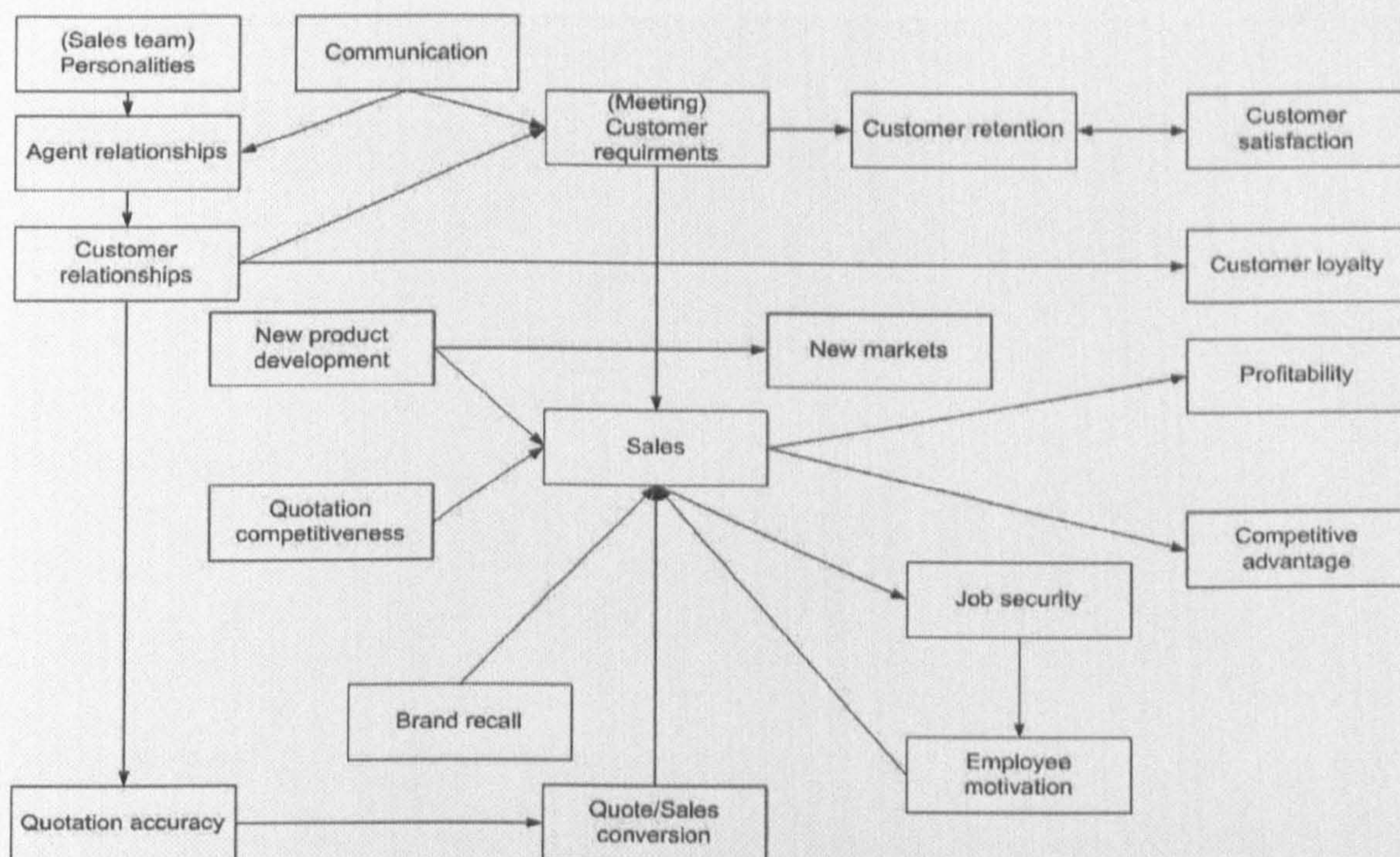


Figure 9.1.4: Shared Mental Map at 2nd Interview

9.1.6 SMM SCU Ownership

Table 9.1.4: SMM SCU Ownership at Interview 1

SMM Standard Causal Units		Inclusion in Individual Manager Mental Maps			Director
Cause	Effect	1	2	3	
Quotation accuracy	Sales	Yes	Yes	No	No
Sales	Investment	No	Yes	Yes	No
Discounts	Sales	No	Yes	Yes	No
Rewards	Employee motivation	No	Yes	Yes	No
Rewards	Employee commitment	No	Yes	Yes	No
Investment	New technology	No	Yes	Yes	No
Investment	Resources	No	Yes	Yes	No
Employee motivation	Sales	Yes	Yes	Yes	No
Leadership involvement	Performance targets	No	Yes	Yes	No
Performance targets	Sales	Yes	No	Yes	No
Performance targets	Employee motivation	Yes	No	Yes	No
New technology	Agent relationships	No	Yes	Yes	No
<i>Total SCUs</i>	<i>12</i>	<i>4</i>	<i>10</i>	<i>11</i>	<i>0</i>
<i>Total individual SCUs</i>		<i>68</i>	<i>44</i>	<i>57</i>	<i>50</i>

Table 9.1.4 illustrates the heavy influence of Managers 2 and 3 in the content of the shared mental map. However, the most notable result was that none of the causal links that were included in the SMM were found in the Director's elicited mental map, vividly demonstrating that the Managers shared understandings were completely at odds with the Director's.

Table 9.1.5: SMM SCU Ownership at Interview 2

SMM Standard Causal Units		Inclusion in Individual Manager Mental Maps				Director
<i>Cause</i>	<i>Effect</i>	1	2	3		
New product development	Sales	Yes	Yes	No	No	
New product development	New markets	Yes	Yes	No	No	
Quotation accuracy	Quote/sales conversion	No	Yes	Yes	No	
Quotation competitiveness	Sales	Yes	No	Yes	No	
Quote/sales conversion	Sales	No	Yes	Yes	No	
Sales	Profitability	Yes	No	Yes	No	
Sales	Competitive advantage	No	Yes	Yes	Yes	
Sales	Job security	No	Yes	Yes	No	
Personalities	Agent relationships	Yes	Yes	No	No	
Job security	Employee motivation	No	Yes	Yes	No	
Employee motivation	Sales	No	Yes	Yes	No	
Agent relationships	Customer relationships	No	Yes	Yes	No	
Customer requirements	Sales	Yes	Yes	No	Yes	
Customer requirements	Customer retention	Yes	Yes	No	No	
Customer requirements	Customer satisfaction	Yes	Yes	No	No	
Customer relationships	Quotation accuracy	No	Yes	Yes	No	
Customer relationships	Customer requirements	Yes	Yes	Yes	No	
Customer relationships	Customer loyalty	Yes	No	Yes	No	
Communication	Agent relationships	Yes	Yes	Yes	No	
Communication	Customer requirements	Yes	Yes	Yes	No	
Customer satisfaction	Customer retention	Yes	Yes	No	No	
Brand recall	Sales	No	Yes	Yes	No	
<i>Total individual SCUs</i>		75	71	65	73	
<i>Total SCUs</i>	22	13	19	15	2	

At the second interview, the ownership has become more evenly spread across the Managers. However, the Director's mental map continues to be very different to the shared mental map, with only two SCUs in common.

9.1.7 Complexity of Maps

Table 9.1.6: Complexity of the SMMs

	Shared SCUs	Total SCUs	%
1 st interview	12	169	7
2 nd interview	22	211	10
<i>Difference</i>			<i>30% increase</i>

The complexity of the SMM increased at the second interview indicating that more SCUs are shared across the management team and hence, a greater consensus on concepts of the sales departments contribution to organisational performance improvement.

9.1.8 Director cognitive centrality

Table 9.1.7: Learning Resource Director Cognitive Centrality

	<i>1st Interview</i>	<i>tf</i>	<i>2nd Interview</i>	<i>tf</i>
1	Sales	12	Market knowledge	11
2	Proactive in seeking tenders	10	(Meeting) Customer requirements	11
3	Cost efficiency	8	Sales	10
4	Quote / Sales conversion	7	(Sales employees) Attitudes	10
5	Network relationships	6	Inter-departmental cohesion	9

Key: tf (total frequency) = $t(in)$ in-degrees + $t(out)$ out-degrees

Table 9.1.7 provided an indication of the concepts that were the most central to the mental maps of the Director at both interviews. Sales remains important at both stages, but the remaining top four concepts differ displaying a noticeable change by the second interview.

9.2 DISCUSSION OF ORGANISATION C

9.2.1 Interview 1

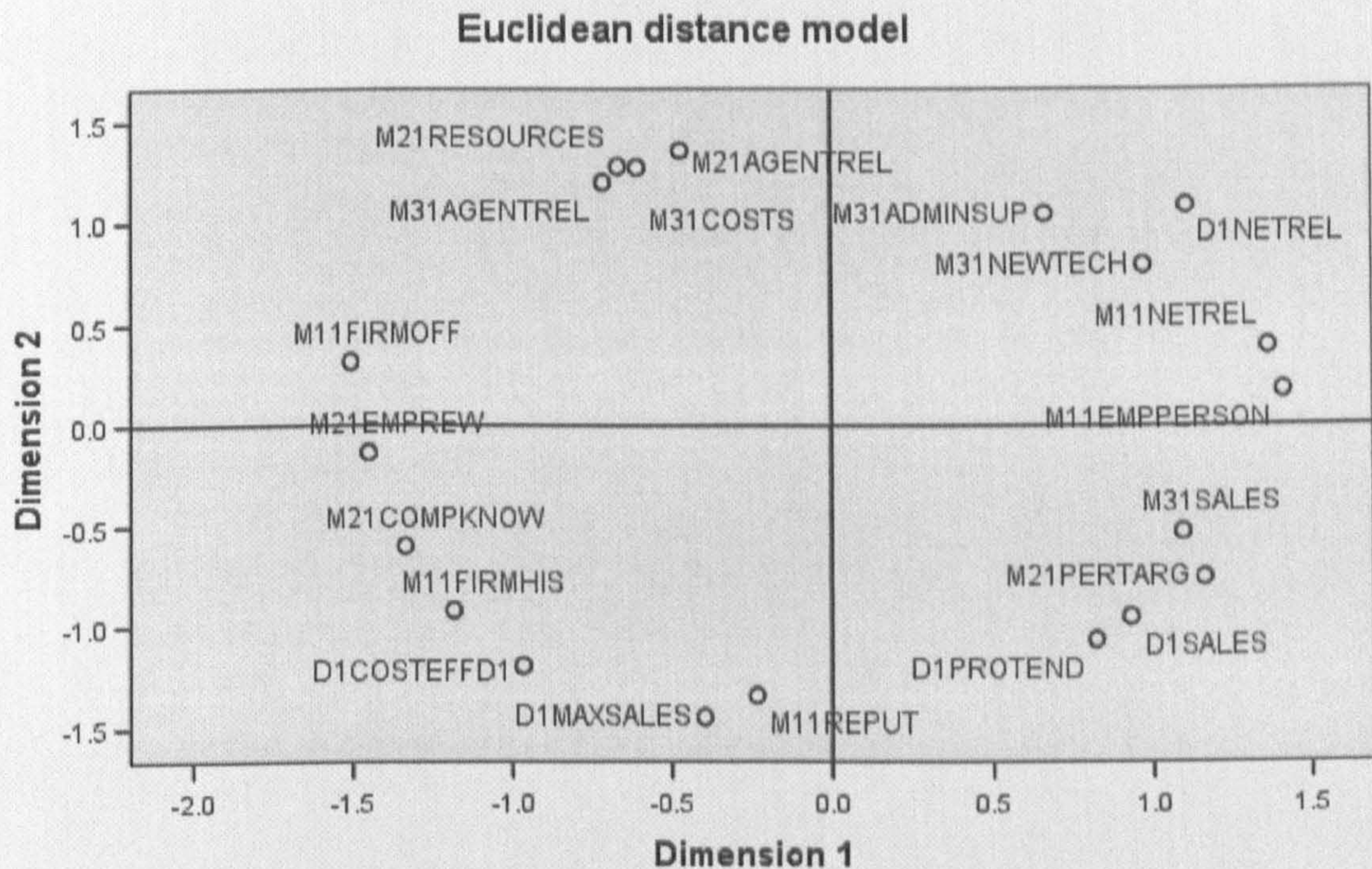
The distance results at the first interview stage are presented in rank order in Table 9.2.1 according to the similarity with the Director's mental map.

Table 9.2.1: Ranked Distance Results at 1st Interview

<i>Ranking</i>		<i>Distance from Director Mental Map</i>
1	Sales Manager 2	0.643
2	Sales Manager 3	0.764
3	Sales Manager 1	0.855
4	Shared Mental Map	1.000

The rankings reveal that Manager 2 was the closest to the Director's mental map of the sales department's contribution to organisational performance improvement at the first interview, whilst the SMM is the most dissimilar, having no concepts in agreement. However, by viewing the proximities and clusters derived from MDS and HCA (Figure 9.1.2), all three sales managers demonstrated a less than weak association with the mental map of the Director demonstrating particularly different mental models regarding the sales department's contribution to organisational performance compared to the Director. The analysis further revealed that Managers 2 and 3 are moderately associated at interview 1, but only weakly associated with Manager 1. The mental map of Manager 1 was therefore, noticeably dissimilar to Managers 2 and 3, who display comparatively greater similarity. What was evident from the range of the distance results and the MDS and HCA analysis was the disparity of mental maps amongst the Sales Managers, and between the Sales Managers and Director (compare with study B, Figure 8.1.2). A MDS anchor theme analysis was utilised to help identify the differences:

Derived Stimulus Configuration



Key:

<i>Abbreviated anchor theme</i>	<i>Full anchor theme</i>	<i>Abbreviated anchor theme</i>	<i>Full anchor theme</i>
SALES	Sales	EMPPERSON	(employee) Personalities
PROTEND	Proactive in seeking tenders	REPUT	(firm) Reputation
MAXSALES	Sales	FIRMHIS	History of firm
COSTEFF	Cost efficiency	FIRMOFF	Firm offerings
NETREL	Network relationships	PERTARG	Performance targets
RESOURCES	Resources	AGENTREL	Agent relationships
NEWTECH	New technology	ADMINSUP	Administrative support
COSTS	Costs	COMPKNOW	Competitor knowledge
CUSFOCUS	Customer focus	EMPREW	(employee) Rewards

Figure 9.2.1: Anchor Theme MDS at Interview 1

The disparity in thinking highlighted above was reflected in the proximities of the anchor theme MDS map where the points form a circular shape near the outer edges of the diagram (indicating large distances between points). No clearly identifiable clusters occurred revealing few similarities and further, of the 20 elicited anchor themes, 18 different themes were utilised.

9.2.2 The formation of the shared mental map at interview 1

The distance results illustrated that the SMM shares no SCUs in common with the Director and consequently the SMM was the most dissimilar mental map with a maximum value of 1. The analysis demonstrated the differing mental maps of the Sales Managers and this has resulted in a SMM of low complexity (see table 9.1.6). This indicated that there was little consensus across the Sales Managers as to what constitutes the contribution the Sales Department can make to organisational performance improvement. Further, the consensus that did emerge was completely at odds with the Director's understanding of the Sales department's contribution. Some explanation for this is found in the Director's cognitive centrality analysis (Table 9.1.6). At interview one, sales was the most cognitively central standard term for the director and although the Director's full mental map is too large to depict pictorially, it was possible to focus on the sales standard term and include the direct causes and effects (Figure 9.2.2). The SMM diagram (Figure 9.1.3) also showed sales to be the most cognitively central standard term ($tf=5$), and the direct causes and effects are reproduced in Figure 9.2.3.

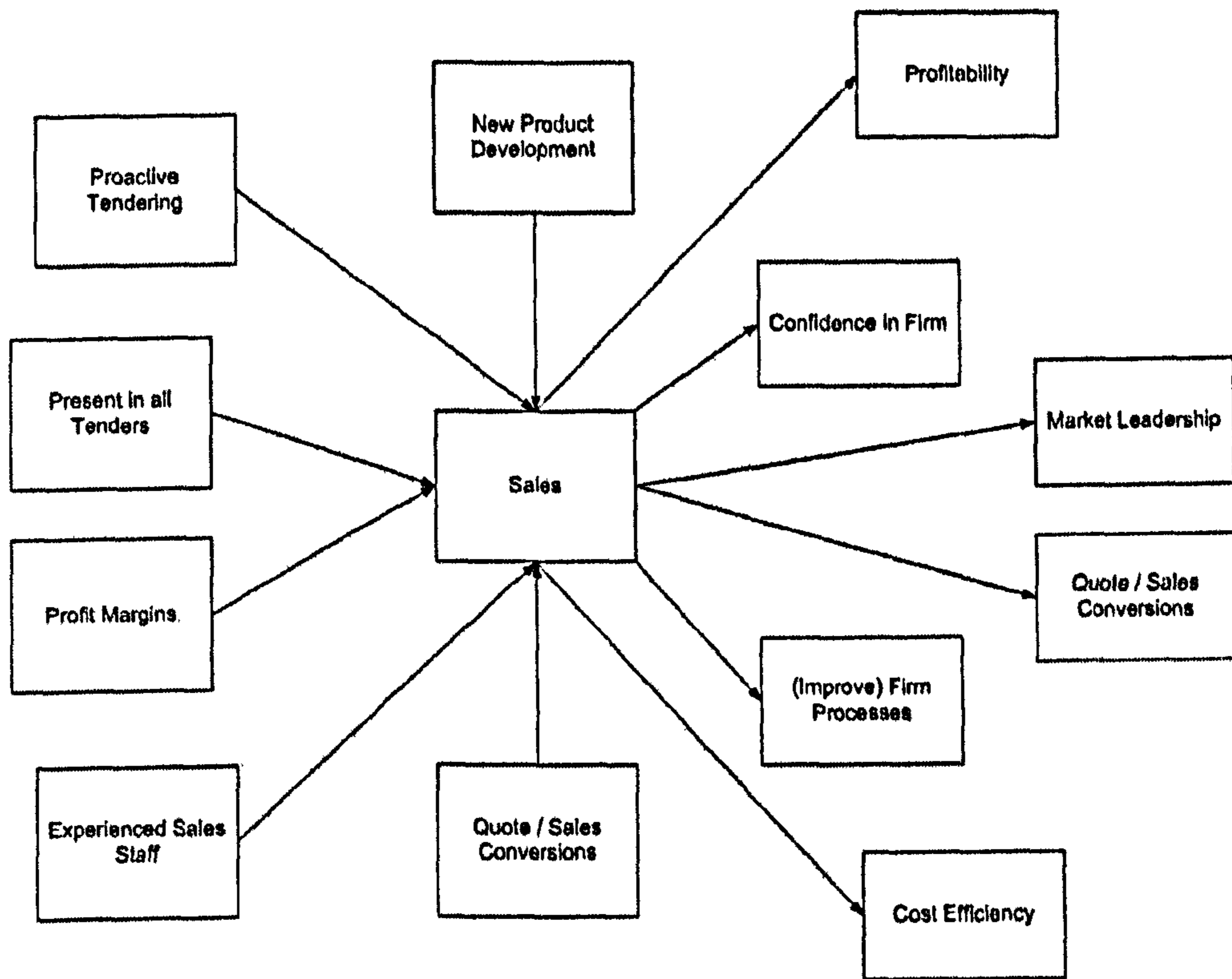


Figure 9.2.2: LRD Sales Standard Term Focus

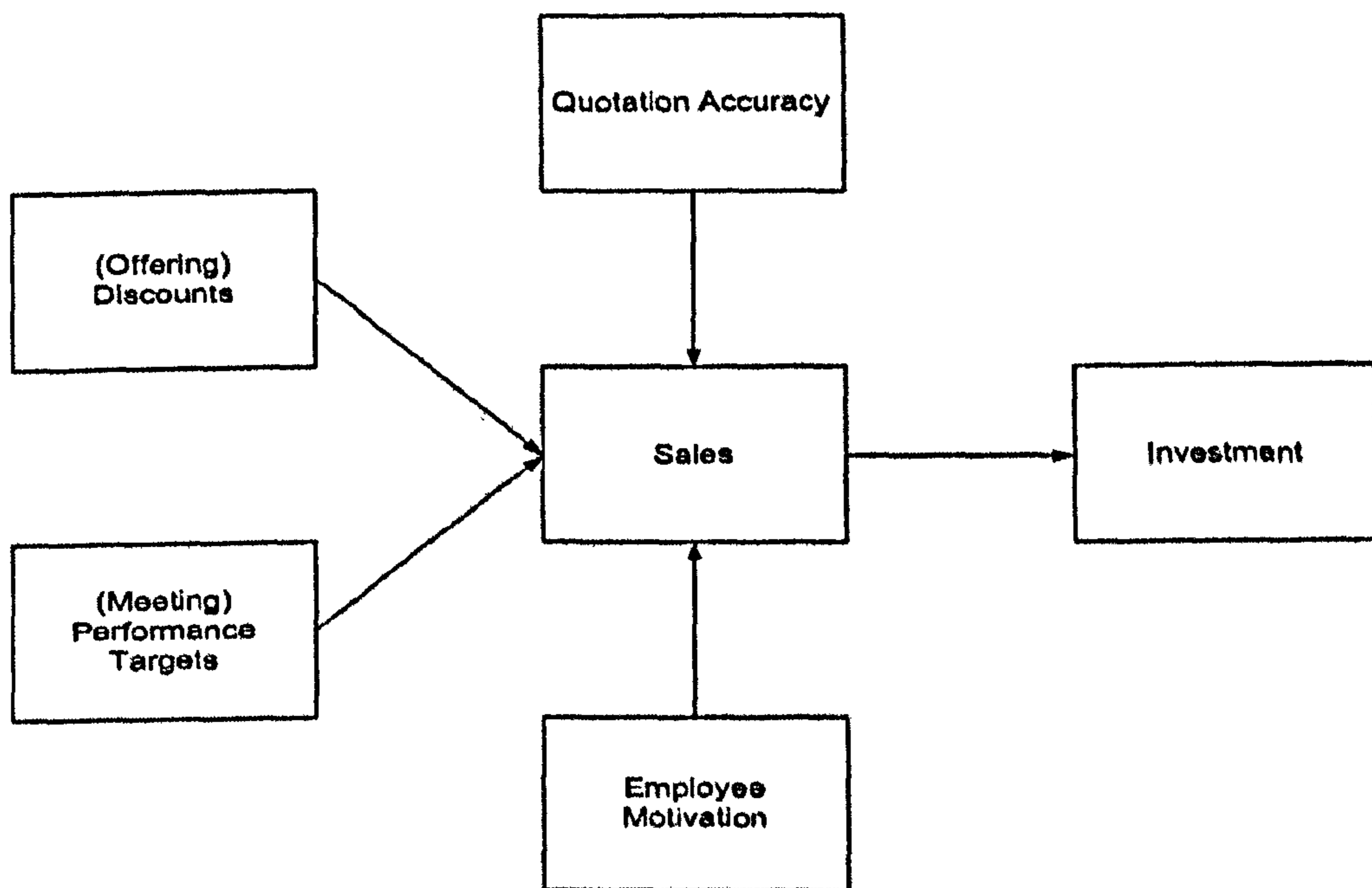


Figure 9.2.3: SMM Sales Standard Term Focus

What was revealed is that although sales was the most cognitively central standard term for both the Director and the SMM, it was the SCUs (causes and effects)

that completely differ. Consequently, the Director and shared understanding of the Sales Managers agree that improving sales was an important factor, but completely disagree on the outcomes of sales improvement or how this could be achieved.

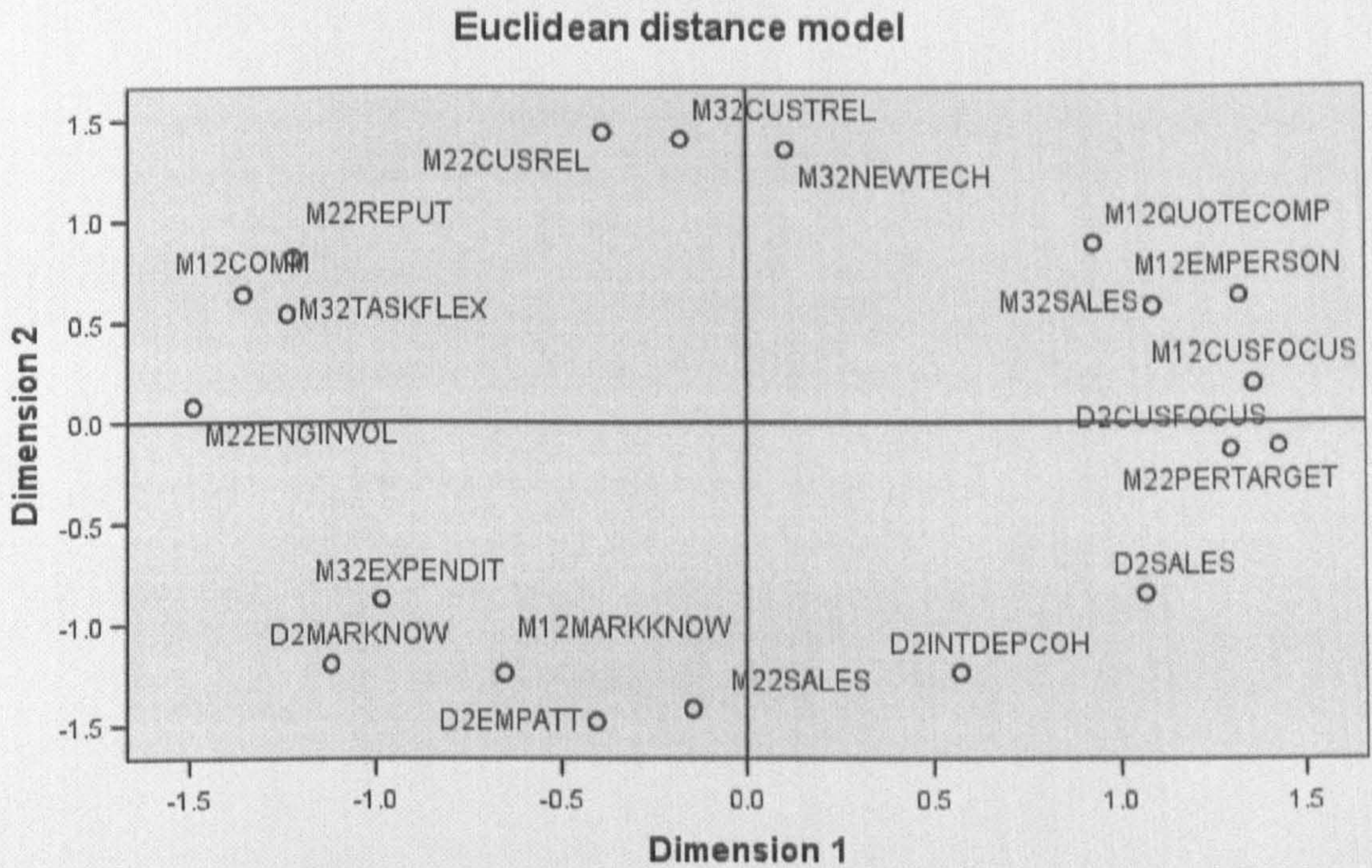
9.2.3 Interview 2

Table 9.2.2: Ranked Distance Results at the Interview 2

<i>Ranking</i>		<i>Distance from Director Mental Map</i>
1	Sales Manager 3	0.602
2	Sales Manager 1	0.639
3	Shared Mental Map	0.758
4	Sales Manager 2	0.779

The rankings show that Manager 3 was the closest to the Director's mental map at the second interview whereas Manager 2, the closest at interview 1, was the most dissimilar. The proximities and clusters derived from MDS and HCA (Figure 9.1.2) revealed Managers 1 and 2 had a moderate association at this stage, while Manager 3 had less than a weak association with both Managers 1 and 2. The Director has a weak association with Manager 3 and a less than weak association with Managers 1 and 2. Once again, the Director's mental map differed significantly from all three of the Sales Managers.

Derived Stimulus Configuration



Key:

<i>Abbreviated anchor theme</i>	<i>Full anchor theme</i>	<i>Abbreviated anchor theme</i>	<i>Full anchor theme</i>
SALES	Sales	PERTARGET	Performance targets
CUSFOCUS	Customer focus	CUSREL	Customer relationships
MARKNOW	Market knowledge	ENGINVOL	Engineering involvement
EMPATT	(employee) Attitudes	REPUT	(firm) Reputation
INTDEPCOH	Inter-departmental cohesion	TASKFLEX	Task flexibility
EMPPERSON	(employee) Personalities	NEWTECH	New technology
COMM	Communication	EXPENDIT	Expenditure
QUOTECOMP	Quotation competitiveness		

Figure 9.2.4: Anchor Theme MDS at Interview 2

The disparate MDS analysis displays a similar pattern to interview 1. However, some similarity was evidenced by the formation of a weak cluster in the top, right-hand quadrant that includes the causes and effects surrounding the anchor themes quotation competitiveness, employee personalities, sales, customer focus and performance targets.

9.2.4 The formation of the shared mental map at interview 2

The distance results display that the SMM ranked third in terms of distance from the Director, closer than only Manager 2. MDS, HCA and the SMM SCU ownership table indicated a more even contribution to the SMM, with Manager 1 having grown in influence. The SMM has also developed to become more complex than at interview 1 indicating a broader agreement on the sales department's contribution to organisational performance improvement. However, the SMM continued to differ noticeably when compared with the Director and has resulted in a less than weak association and only 2 SCUs are held in common from the SMM total of 22 SCUs.

9.2.5 Change over the interview period: Individual learning

The results from the two interview stages are presented in rank order in Table 9.2.3 according to the amount of convergence (or divergence) with the Director's mental maps.

Table 9.2.3: Ranked Mental Map Change

Distance difference between interviews / Distance from LRD at 1st interview x 100

Rank		1st Interview	2nd Interview	
1	M1	.855	.639	25% Convergence
2	SMM	1.000	.758	24% Convergence
3	M3	.764	.602	21% Convergence
4	M2	.643	.779	21% Divergence

By interview 2, the mental map of Manager 1 was now 25% more similar to the Director than at interview 1, however, remains less than weakly associated with the Director. Figure 9.1.2 demonstrated that if Manager 1 had not, in fact, changed their mental map at all from interview 1, the Manager would have been moderately associated at interview 2. Manager 3 exhibited slightly less improvement in mental map similarity with the Director in comparison to Manager 1. This however, has been shown

to be as a result of a change in the Directors mental map rather than the Manager's.

Manager 2 was the only Manager to show a decreased similarity at the second interview.

9.2.6 Organisational learning

The change in the SMM improved the similarity with the Director by 24%, very close to that achieved by Manager 1. The analysis revealed a disproportionate influence on the content of the SMM by Managers 2 and 3 at the first interview. By interview 2, Manager 1 became more prominent and the three Sales Managers contribute more evenly to the SMM. At interview 1, the shared understandings Manager's 2 and 3 espoused about the role of the sales department in contributing to organisational performance improvement were completely at odds with the Learning Resources Director. By the second interview the contribution of Manager 1's concepts into the SMM improved the similarity of the SMM with the mental map of the Director. By agreeing and including Manager 1's ideas the SMM became more complex and more aligned with the ideas of the Director. However, at the second interview, although marginally improved, the SMM remained less than weakly associated with the Director and hence, very different.

9.2.7 Higher and lower level learning

Manager's 1, 2, the Director and the SMM evidenced marked changes over the two interviews whereas the mental map change of Manager 3 was comparatively small, indicative of higher-level learning for the former, and lower-level learning for the latter.

CHAPTER 10

10. Organisation D: Results, Analysis and Discussion

10.1 ORGANISATION D: RESULTS AND ANALYSIS

10.1.1 Elicited data for comparison

The research participants for this study were the Operations Manager (Senior Manager) who oversaw the functioning of the engineering project team and three representatives from the team: Engineering Manager (M1), Production Manager (M2), and Project Quality Assurance Manager (M3). The participants were interviewed twice, with a period of approximately 12 months between interviews. Chapter 6 outlined the method of the interviews and Appendix E includes the raw data sheets. A total of 40 causal cognitive maps were elicited consisting of 596 Natural Language Units which were compressed into 99 Standard Terms, resulting in 439 Standard Causal Units.

10.1.2 Distance Results

Table 10.1.1 displays the distance results of the mental maps elicited at the two interview phases for the three Managers (M1-M3), the shared mental map (SMM), and the Senior Manager (SM).

Table 10.1.1: Mental Map Distance Results

	<i>SMM1</i>	<i>SMM2</i>	<i>SM1</i>	<i>SM2</i>	<i>M11</i>	<i>M12</i>	<i>M21</i>	<i>M22</i>	<i>M31</i>	<i>M32</i>
<i>SMM1</i>	0.000									
<i>SMM2</i>	0.569	0.000								
<i>SM1</i>	0.588	0.485	0.000							
<i>SM2</i>	0.843	0.749	0.546	0.000						
<i>M11</i>	0.504	0.596	0.636	1.000	0.000					
<i>M12</i>	0.621	0.417	0.516	0.627	0.503	0.000				
<i>M21</i>	0.452	0.849	0.611	0.585	0.683	0.638	0.000			
<i>M22</i>	0.674	0.498	0.456	0.458	0.599	0.620	0.675	0.000		
<i>M31</i>	0.435	0.596	0.530	0.675	0.678	0.670	0.589	0.631	0.000	
<i>M32</i>	0.531	0.473	0.529	0.778	0.582	0.571	0.506	0.669	0.436	0.000

Key:

<i>SMM1</i>	Shared Mental Model (1st Interview)	<i>M12</i>	Engineering manager (2nd Interview)
<i>SMM2</i>	Shared Mental Model (2nd Interview)	<i>M21</i>	Production manager (1st Interview)
<i>SM1</i>	Operations manager (1st Interview)	<i>M22</i>	Production manager (2nd Interview)
<i>SM2</i>	Operations manager (2nd Interview)	<i>M31</i>	Project QA manager (1st Interview)
<i>M11</i>	Engineering manager (1st Interview)	<i>M32</i>	Project QA manager (2nd Interview)

10.1.3 Convergence or divergence of mental maps from the senior manager

Table 10.1.2: Mental Map Change Over the Interview Phases

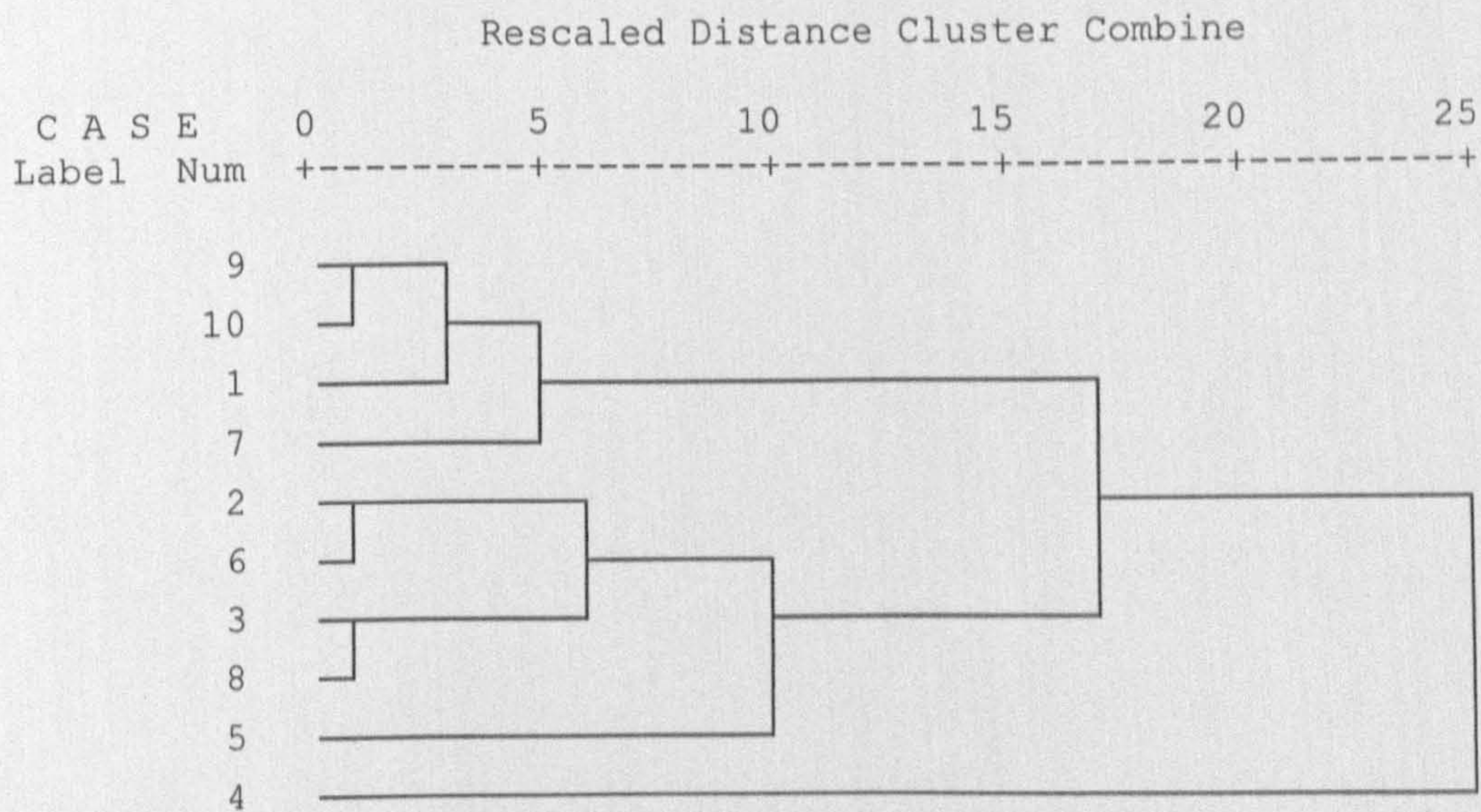
	<i>Distance difference between interviews / Distance from SM at 1st interview x 100</i>		
	<i>1st Interview</i>	<i>2nd Interview</i>	
<i>SMM</i>	0.588	0.749	27% divergence
<i>M1</i>	0.636	0.627	3% convergence
<i>M2</i>	0.611	0.458	15% convergence
<i>M3</i>	0.530	0.778	25% divergence

10.1.4 Mental Map Proximities: Multi-dimensional scaling and Hierarchical cluster analysis

Table 10.1.3: Hierarchical Cluster Analysis Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	M31	M32	.442	0	0	4
2	SMM2	M12	.449	0	0	6
3	SM1	M22	.477	0	0	6
4	SMM1	M31	.592	0	1	5
5	SMM1	M21	.781	4	0	8
6	SMM2	SM1	.832	2	3	7
7	SMM2	M11	1.106	6	0	8
8	SMM1	SMM2	1.587	5	7	9
9	SMM1	SM2	2.230	8	0	0

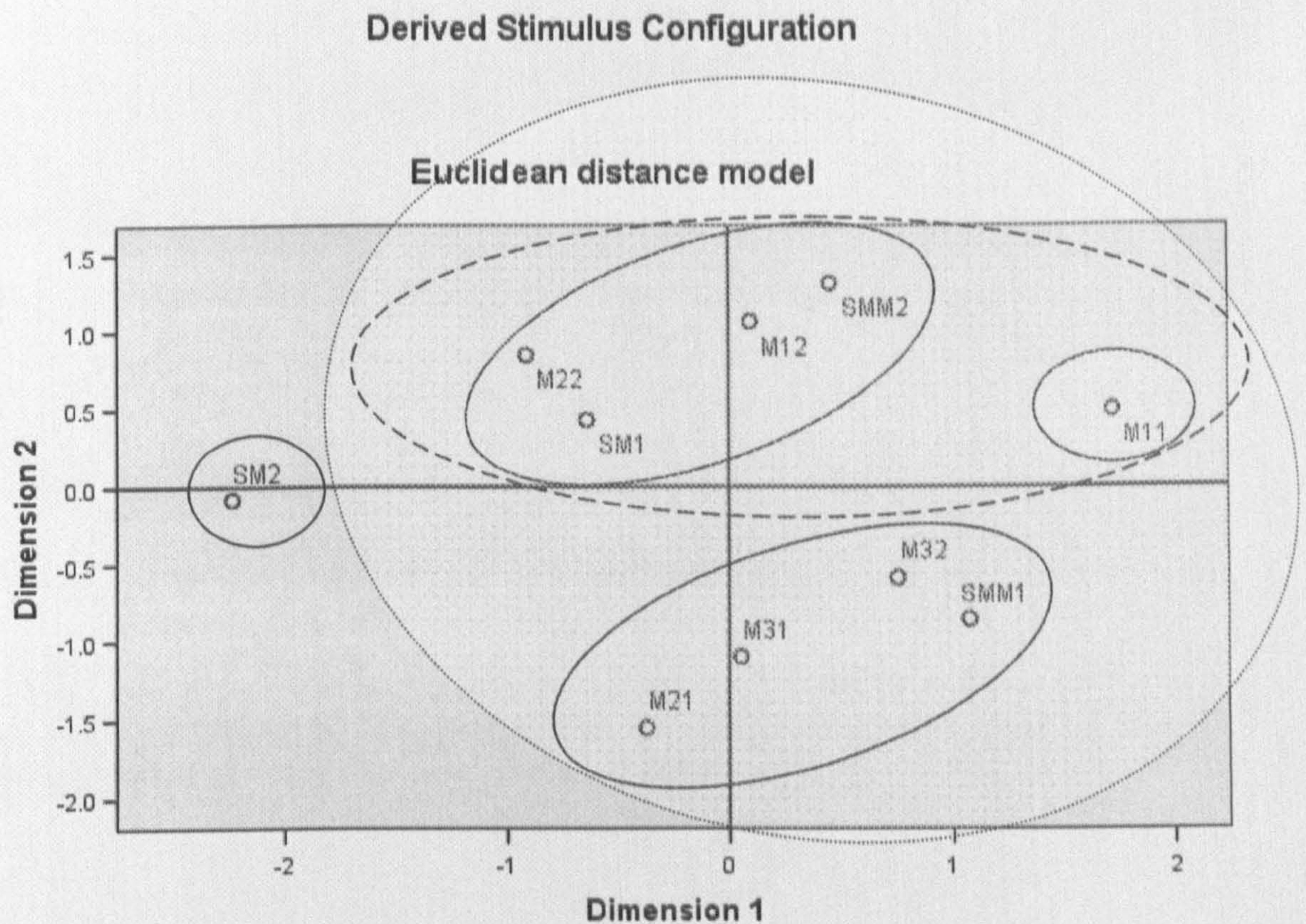
Dendrogram using Complete Linkage



Key:

Case	Case	Case	Case	Case
1	SMM1	3	SM1	5
2	SMM2	4	SM2	6
				7
				8
				9
				10

Figure 10.1.1: Hierarchical Cluster Analysis Dendrogram



Cluster agglomeration key:

1. Strong association _____
2. Moderate association - - - - -
3. Weak association

Figure 10.1.2: MDS and Hierarchical Cluster Analysis of Mental Maps

The distance results and MDS/HCA revealed strong similarities between the mental maps of Manager 3 elicited at the two interviews. The indication was that for Manager 3 the ideas of how the engineering project team can contribute to overall organisational performance showed little change after 12 months. Manager 1 displays a greater amount of change in comparison to Manager 3 as evidenced by a moderate association, yet less than Manager 2 who exhibits a weak association. The Senior Manager comparatively exhibits the greatest amount of mental map change after 12

months as the mental map derived from interview 2 was less than weakly associated with the first interview. Further, by the second interview, the Senior Manager's mental map was less than weakly associated with any of the Management teams' mental maps. Strong associations are evident between Managers 2 and 3 at the first interview and Managers 1 and 2 at the second interview and notably, the mental maps of Managers 1 and 2 elicited at the second interview are strongly associated with the mental map derived from the Senior Manager at the first interview.

10.1.5 Organisational Learning of Study D

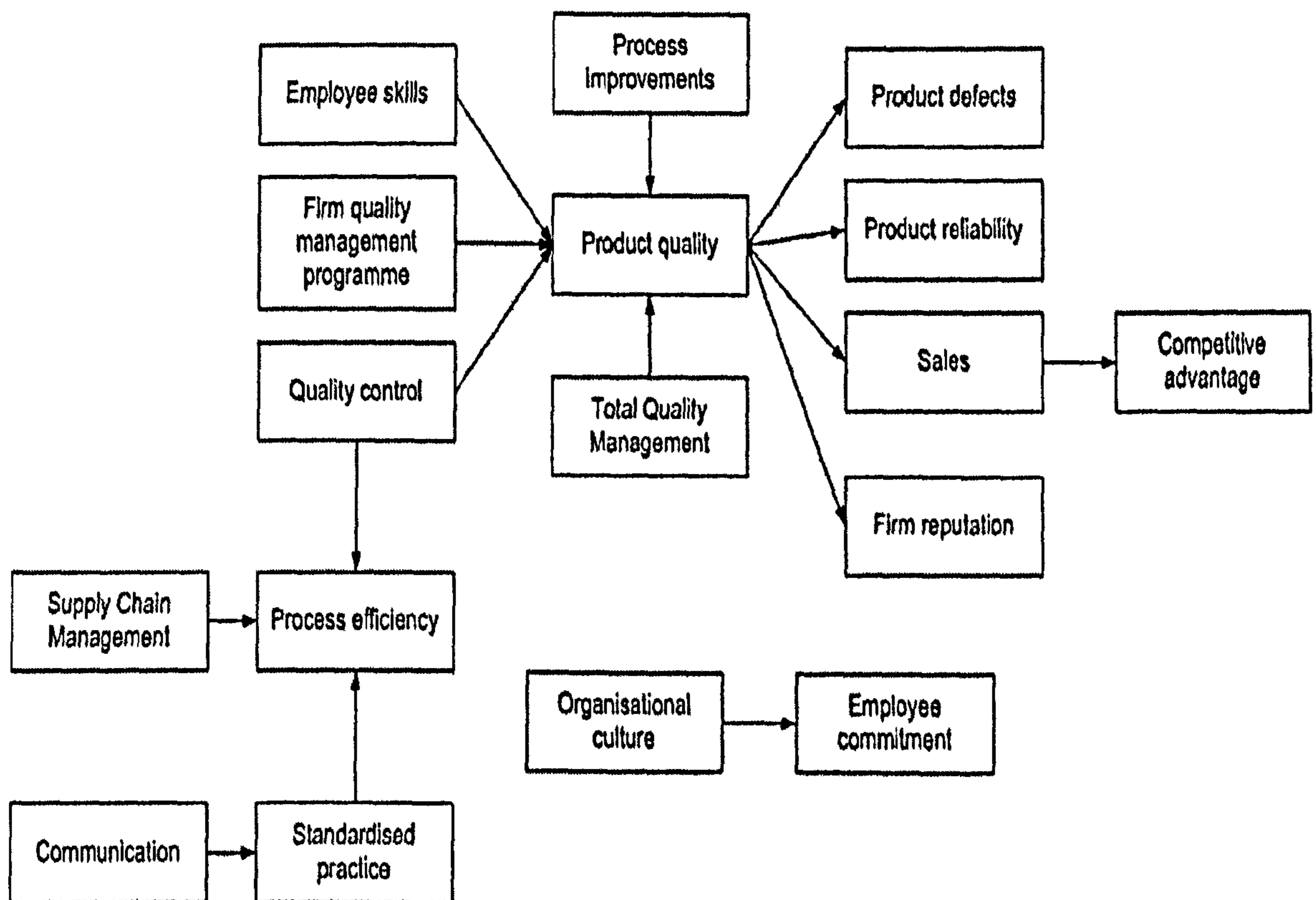


Figure 10.1.3: Shared Mental Map at Interview 1

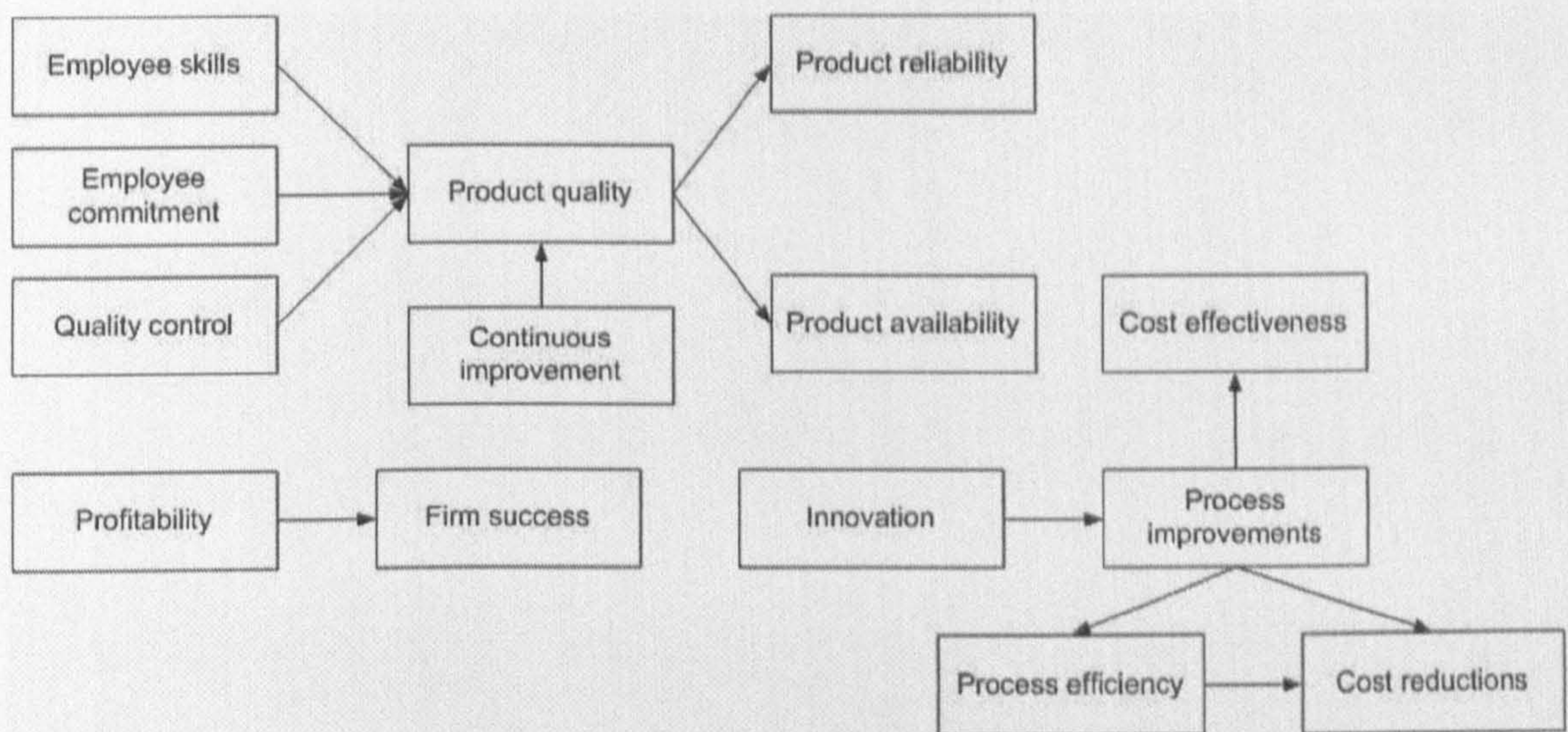


Figure 10.1.4: Shared Mental Map at Interview 2

10.1.6 SMM SCU Ownership

Table 10.1.4: SMM SCU Ownership at Interview 1

SMM Standard Causal Units		Inclusion in Individual Manager Mental Maps			Senior Manager
Cause	Effect	1	2	3	
Employee skills	Product quality	Yes	No	Yes	Yes
Organisational culture	Employee commitment	Yes	Yes	No	No
Product quality	Product reliability	Yes	No	Yes	Yes
Product quality	Product defects	Yes	Yes	No	No
Product quality	Sales	No	Yes	Yes	No
Product quality	Firm reputation	Yes	Yes	No	No
(firm) defects and snags management programme	Product quality	Yes	No	Yes	Yes
Total Quality Management	Product quality	No	Yes	Yes	No
Quality control	Product quality	Yes	No	Yes	Yes
Quality control	Process efficiency	No	Yes	Yes	Yes
Sales	Competitive advantage	Yes	Yes	No	No
Process improvements	Product quality	No	Yes	Yes	No
Supply Chain Management	Process efficiency	No	Yes	Yes	No
Communication	Standardised practice	No	Yes	Yes	No
Standardised practice	Process efficiency	No	Yes	Yes	No
<i>Total SCUs</i>	<i>15</i>	<i>8</i>	<i>11</i>	<i>11</i>	<i>5</i>
<i>Total Individual SCUs</i>		<i>76</i>	<i>88</i>	<i>76</i>	<i>66</i>

Table 10.1.5: SMM SCU Ownership at Interview 2

SMM Standard Causal Units		Inclusion in Individual Manager Mental Maps			Senior Manager
<i>Cause</i>	<i>Effect</i>	1	2	3	
Employee skills	Product quality	Yes	Yes	No	No
Employee commitment	Product quality	Yes	Yes	Yes	No
Product quality	Product reliability	Yes	No	Yes	No
Product quality	Product availability	Yes	No	Yes	No
Quality control	Product quality	Yes	Yes	Yes	No
Profitability	Firm success	No	Yes	Yes	No
Continuous improvement	Product quality	Yes	No	Yes	No
Innovation	Process improvements	Yes	No	Yes	No
Process improvements	Process efficiency	Yes	Yes	No	Yes
Process improvements	Cost reduction	Yes	Yes	No	Yes
Process improvements	Cost effectiveness	Yes	No	Yes	No
Process efficiency	Cost reduction	No	Yes	Yes	No
<i>Total Individual SCUs</i>		58	57	75	68
<i>Total SCUs</i>	12	10	7	9	2

The SMM SCU ownership was influenced slightly more (3 SCUs) by Managers 2 and 3 at the first interview stage with the mental map of the Senior Manager exhibiting 5 of the 15 shared SCUs. The shared understandings across the Management team and Senior Manager centre on the causes and effects of product quality. By the second interview, the influence of Managers 2 and 3 decline slightly, whereas that of Manager 1 increased. The change in the mental model of the Senior Manager moves away from predominantly product quality to share only the effects of process improvements with the shared understanding of the Management team.

10.1.7 Complexity of maps

Table 10.1.6: Complexity of Maps

	Shared SCUs	Total SCUs	%
1 st interview	15	240	6%
2 nd interview	12	190	6%
<i>Difference</i>			<i>No change</i>

10.1.8 Senior manager cognitive centrality

Table 10.1.7: Senior Manager Cognitive Centrality

	<i>1st Interview</i>	<i>tf</i>	<i>2nd Interview</i>	<i>tf</i>
1	Cost reductions	14	Process improvements	17
2	Continuous improvement	13	Cost reductions	15
3	Product quality	10	Project management	10
4	Process efficiency	10	Site configuration	10
5	Employee accountability	9	Product quality	6

Key: tf (total frequency) = $t(\text{in})$ in-degrees + $t(\text{out})$ out-degrees

The cognitive centrality analysis revealed a particular focus for the change in the Senior Manager's mental maps was the importance of process improvements which did not appear in the top five most cognitively central standard terms at the first interview.

10.2 DISCUSSION OF ORGANISATION D

10.2.1 Interview 1

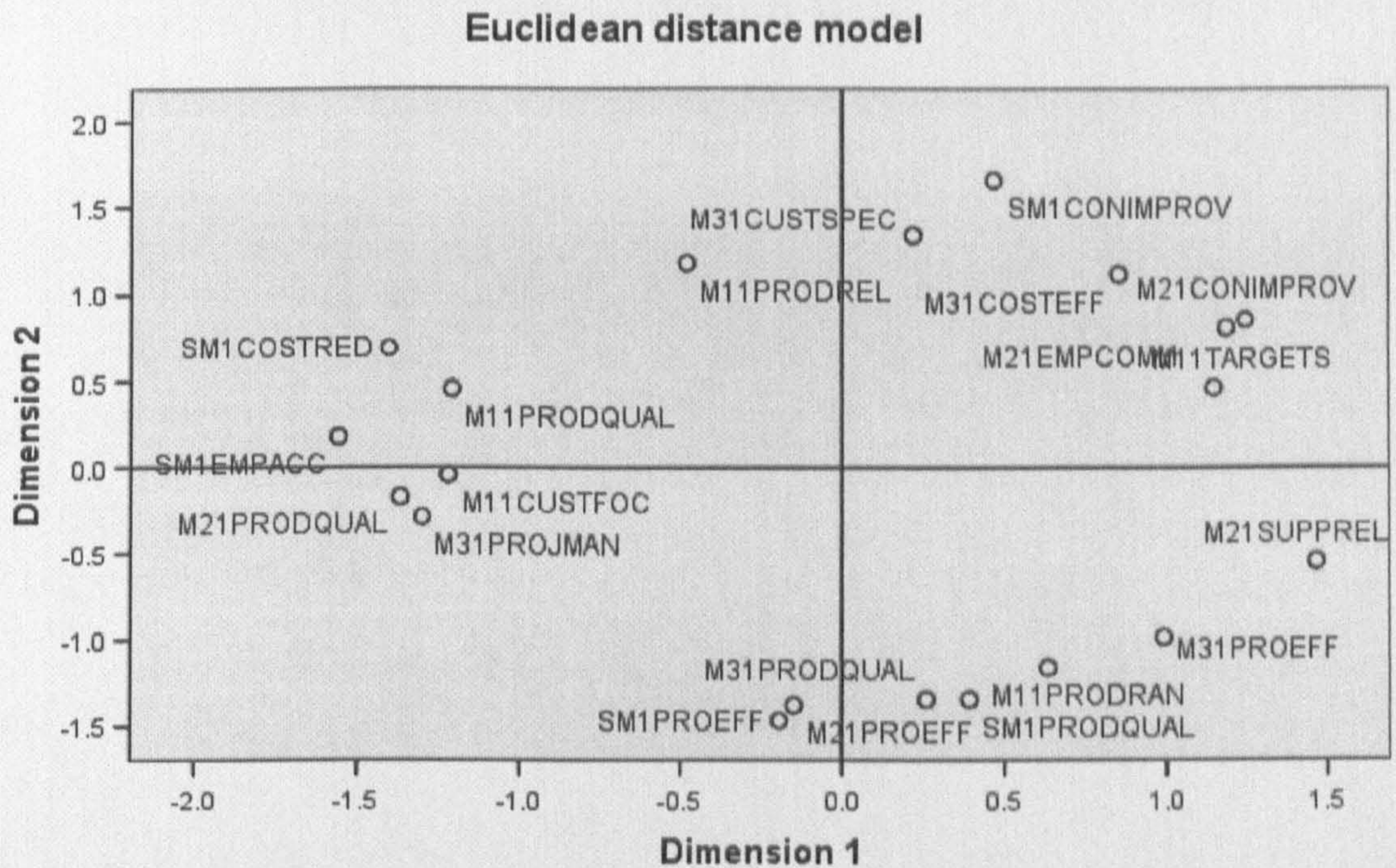
The distance results of the Management team and the SMM in rank order with the Senior Manager at the first interview stage presented in Table 10.2.1.

Table 10.2.1: Ranked Distance Results at 1st Interview

<i>Ranking</i>		<i>Distance from Director Mental Map</i>
1	Manager 3	0.530
2	Shared Mental Map	0.588
3	Manager 2	0.611
4	Manager 1	0.636

The mental map of Manager 3 was the most similar to the Senior Manager's mental map at the first interview whilst Manager 1 was the most dissimilar. The MDS/HCA analysis revealed that Managers' 2 and 3 have strong mental map similarities at this stage, whereas Manager 1 was only weakly associated with Manager 2 and 3. The anchor theme analysis provides further information regarding these similarities and differences:

Derived Stimulus Configuration



Key:

<i>Abbreviated anchor theme</i>	<i>Full anchor theme</i>	<i>Abbreviated anchor theme</i>	<i>Full anchor theme</i>
COSTRED	Cost reduction	SUPPREL	Supplier relationships
PROEFF	Process efficiency	EMPCOMM	Employee commitment
EMPACC	Employee accountability	PROJMAN	Project management
CONIMPROV	Continuous improvement	COSTEFF	Cost effectiveness
PRODQUAL	Product quality	CUSTSPEC	Customer specifications
PRODRAN	Product range	CUSTFOC	Customer focus
TARGETS	Targets	PRODREL	Product reliability

Fig 10.2.1: Anchor Theme MDS at Interview 1

The anchor theme map displays identifiable groupings populated by a mix of owners which reflects that there was some consensus across the Managers in terms of anchor themes and causes/effects.

10.2.2 The formation of the shared mental map at interview 1

The shared mental map was the second most similar map to the Director behind Manager 3. The content of the SMM was dominated by the causes and effects of product quality (Figure 10.1.3) and the analysis demonstrated the marginally greater influence of Managers 2 and 3 in comparison to Manager 1.

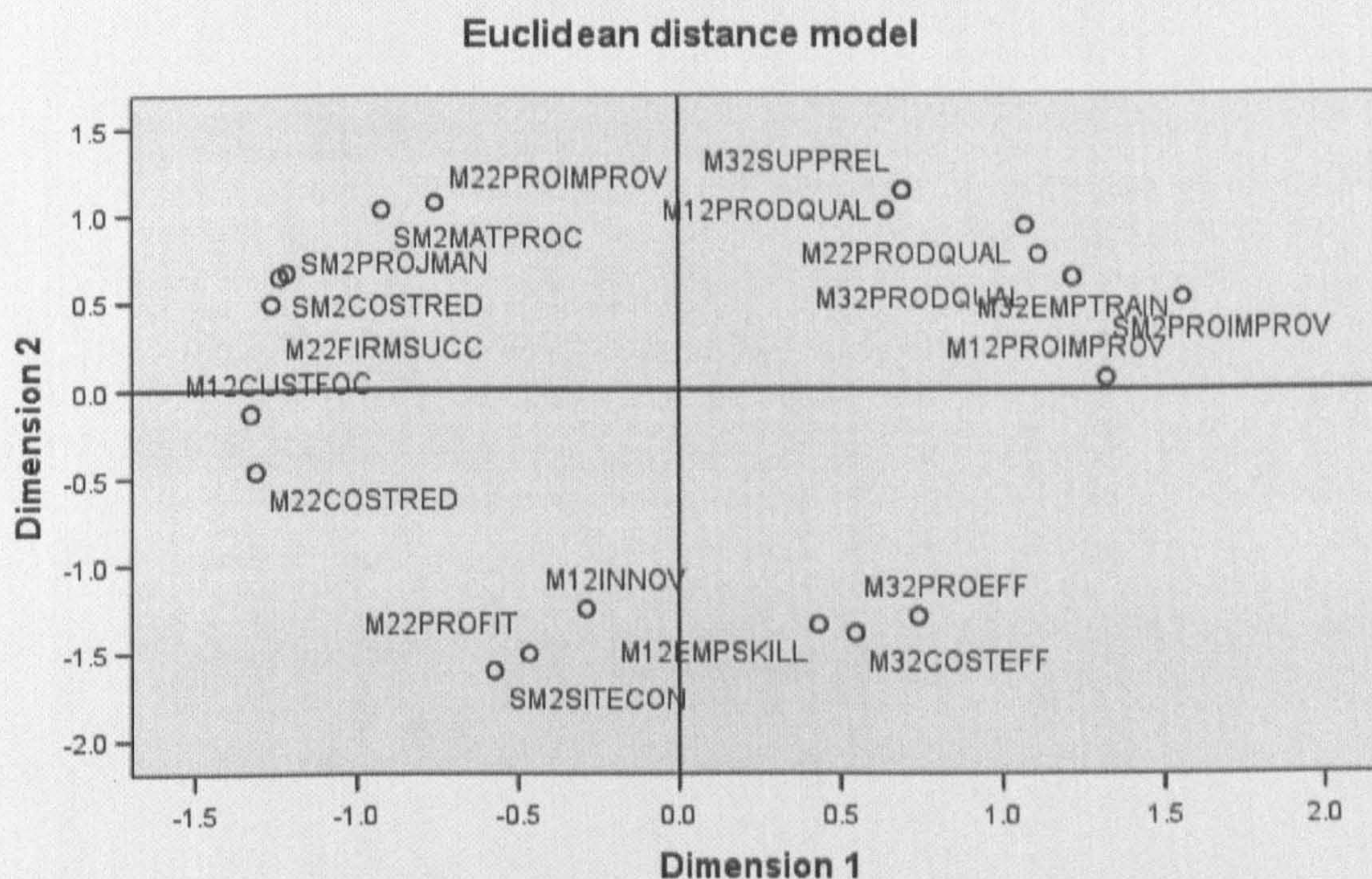
10.2.3 Interview 2

Table 10.2.2: Distance Results at Interview 2

<i>Ranking</i>		<i>Distance from Senior Manager Mental Map</i>
1	Manager 2	0.458
2	Manager 1	0.627
3	Shared Mental Map	0.749
4	Manager 3	0.778

Manager 2 was the most similar to the Senior Manager's mental map at the second interview, while Manager 3 was the most dissimilar. The distance results range and analysis demonstrated that at this stage there was a greater difference between the Managers than at the first interview indicating less consensus amongst the Management team. The analysis also revealed that the Senior Manager had developed a significantly changed mental map at this stage that displayed a less than weak association with all of the Management team members.

Derived Stimulus Configuration



Key:

<i>Abbreviated anchor theme</i>	<i>Full anchor theme</i>	<i>Abbreviated anchor theme</i>	<i>Full anchor theme</i>
COSTRED	Cost reduction	PRODQUAL	Product quality
MATPROC	Material procurement	PROFIT	Profitability
PROIMPROV	Process improvement	SUPPREL	Supplier relationships
PROJMAN	Project management	EMPTRAIN	Employee training
SITECON	Site configuration	COSTEFF	Cost effectiveness
FIRMSUCC	Firm success	CUSTFOC	Customer focus
PROEFF	Process efficiency	INNOV	Innovation
EMPSKILL	Employee skills		

Fig 10.2.2: Anchor Theme Multidimensional Scaling at Interview 2

The anchor theme analysis provides information regarding the differences that had emerged by the second interview. The grouping in the top, left hand quadrant was disproportionately populated by the Senior Manager with three anchor themes (material procurement, project management, cost reduction) that cluster closely indicating similar causes and effects. Manager 2 was the only member of the Management team to appear

in this quadrant and contributes the causes and effects of two anchor themes (process improvements and firm success) and hence, some explanation for the similarities between these Managers and the differences between the Senior Manager and Manager's 1 and 3. The cluster in the top, right-hand quadrant demonstrated the Management teams continued focus on product quality.

10.2.4 *The formation of the shared mental map at interview 2*

The SMM ranks third in its similarity to the Senior Manager's mental map. The analysis indicated that while the influence of the three Managers on the SMM was reasonably even, Manager 1 had increased in influence on the SMM, whilst Manager 2 had decreased in influence.

10.2.5 *Change over the interview period: Individual learning*

Table 10.2.3: Ranked Mental Map Change

Distance difference between interviews / Distance from LRD at 1st interview x 100

<i>Rank</i>		<i>1st Interview</i>	<i>2nd Interview</i>	
<i>1</i>	<i>M2</i>	<i>0.611</i>	<i>0.458</i>	<i>15% convergence</i>
<i>2</i>	<i>M1</i>	<i>0.636</i>	<i>0.627</i>	<i>3% convergence</i>
<i>3</i>	<i>M3</i>	<i>0.530</i>	<i>0.778</i>	<i>25% divergence</i>
<i>4</i>	<i>SMM</i>	<i>0.588</i>	<i>0.749</i>	<i>27% divergence</i>

The mental map of Manager 2 was 15% more similar to the Senior Manager at the second interview, the greatest amount of convergence. Of the Management team, Manager 3, who was the most similar to the Senior Manager at the first interview stage, had diverged 25% at the second interview. The analysis revealed that the cause of this was not due to the mental map of Manager 3 changing significantly, rather, it was the lack of change that caused the divergence with the Senior Manager.

10.2.6 Organisational learning

The SMM displayed the greatest amount of divergence from the mental map of the Senior Manager at the second interview. The MDS and HCA analysis (Figure 10.1.2) demonstrated a strong association between the SMM and Managers 2 and 3 at the first interview and a weak association with Manager 1. The result indicates the strength of influence Managers 2 and 3 had on the Management teams shared understandings at this stage. However, by interview two, Manager 1 increased in influence and demonstrated a strong association with the SMM. Manager 2 also had a strong association, whereas Manager 3 declines in influence and is only weakly associated with the SMM. These results support the rationale of the OL/OP model in the fact that at interview 1 the shared concepts held regarding the engineering teams contribution to organisational performance improvement are strongly influenced by Manager 3, the Manager whose mental map was the closest to the Senior Manager. By interview 2, Manager 3 is now the most dissimilar and the influence of this manager on the SMM has decreased in favour of Manager 1. In essence, the concepts held by Manager 3 at interview 2 have not been included in the shared understandings as they had been at interview 1. The proposition was that this process of expunging the more idiosyncratic concepts that did not meet with collective approval would lead to shared understandings that are more similar between the management team and Senior Manager than between the Senior Manager and individual managers. However, in this case, the SMM has become more dissimilar to the mental map of the Senior Manager than any of the individual members of the management team. The MDS and HCA analysis particularly indicated why this result occurred. Managers 1 and 2 are the most influential in the development of the SMM at the second interview, yet these managers are also strongly associated with the mental map of the Senior Manager at the first interview. Essentially, at the second

interview a shared understanding has arisen that was strongly associated to the Senior Manager's mental model at the first interview. By the second interview however, the Senior Manager's mental map concepts had moved on and for example, process improvements figure prominently at the expense of product quality which was prominent at the first interview. The indication was that, particularly Managers 1 and 2, have recognised the new concepts held by the Senior Manager that resulted in a greater similarity in maps at the second interview. However, the SMM had been slower to change and continued to reflect the concepts that were deemed important at the first interview.

10.2.7 Higher and lower level learning

MDS and HCA demonstrated the largest change as being the Senior Manager over the two interviews. At the second interview the Senior Manager had developed a lone cluster that endures until the final agglomeration, highlighting the difference between this mental map and that elicited at the first interview stage. Manager 3 showed the smallest change over the interviews as the first and second interview maps cluster together at the first agglomeration (strong association). There was therefore, an indication of a large difference between the two Managers and the extent of change in their elicited mental maps. The former is indicative of higher-level learning, whilst the latter is representative of lower-level learning.

CHAPTER 11

11. Overall Discussion and Conclusions

11.1 INTRODUCTION

The following section integrates the results of the four organisations to provide an overall discussion and conclusions of the research into the process and value of OL. The chapter begins by briefly reintroducing the rationale of the research to provide a basis for the discussion and conclusions.

11.2 THE RATIONALE OF THE RESEARCH

The aim of the research was to empirically study the process of organisational learning and evaluate the value for organisational performance improvement. The reasoning of the research was that the concept potentially improves organisational performance in comparison to individual learning as proposed by the rationale of the literature developed (Chapters 3 and 4) OL/organisational performance model (see Figure 11.1). The model advocated that as individuals learn experientially, their mental models develop and adjust. As these mental models are made explicit, and processes such as negotiation and argument may ensue, shared mental models develop. Over time, change in the shared mental models, as long as any resultant action affects the organisation, constitutes OL. OL can facilitate improved organisational performance, in comparison to individual learning, through the development of a broader understanding of the external and internal environments and the development of a shared vision which provides the basis for unified action. This proposition was then empirically tested by utilising four study organisations.

Departmental and top manager mental models regarding how the department can contribute to organisational performance improvement were represented by causal cognitive mapping at two interview phases 12 months apart. The change in the individuals' mental maps at interview 2 compared with interview 1 signified individual learning. When the concepts common to the majority of the departmental management team derived from the individual mental maps are grouped into a shared mental map, the change in the shared mental map at interview 2 compared with interview 1 represented OL. By comparing the individual learning of the departmental managers with the top manager(s) and measuring the amount of similarity between this dyad, how shared the concepts of the departments contribution to organisational performance improvement can be quantified. Whether the amount of similarity had increased or decreased by the second interview indicated whether the individual managers' learning has resulted in more, or less, shared concepts. By conducting the same process with the shared mental map whether the similarity has increased or decreased by the second interview indicates whether OL has resulted in more, or less, shared concepts between the departmental management team and the top manager(s). According to the rationale of the OL/OP model, OL will result in a greater similarity of concepts in comparison to individual learning because of the processes of sharing and validating concepts before organisational action. As a result of the similarity of concepts across the top and departmental managers, the likelihood of coordinated action resulting from OL increases in comparison to individual learning, which is more likely to lead to dissimilar concepts and non-coordinated organisational action.

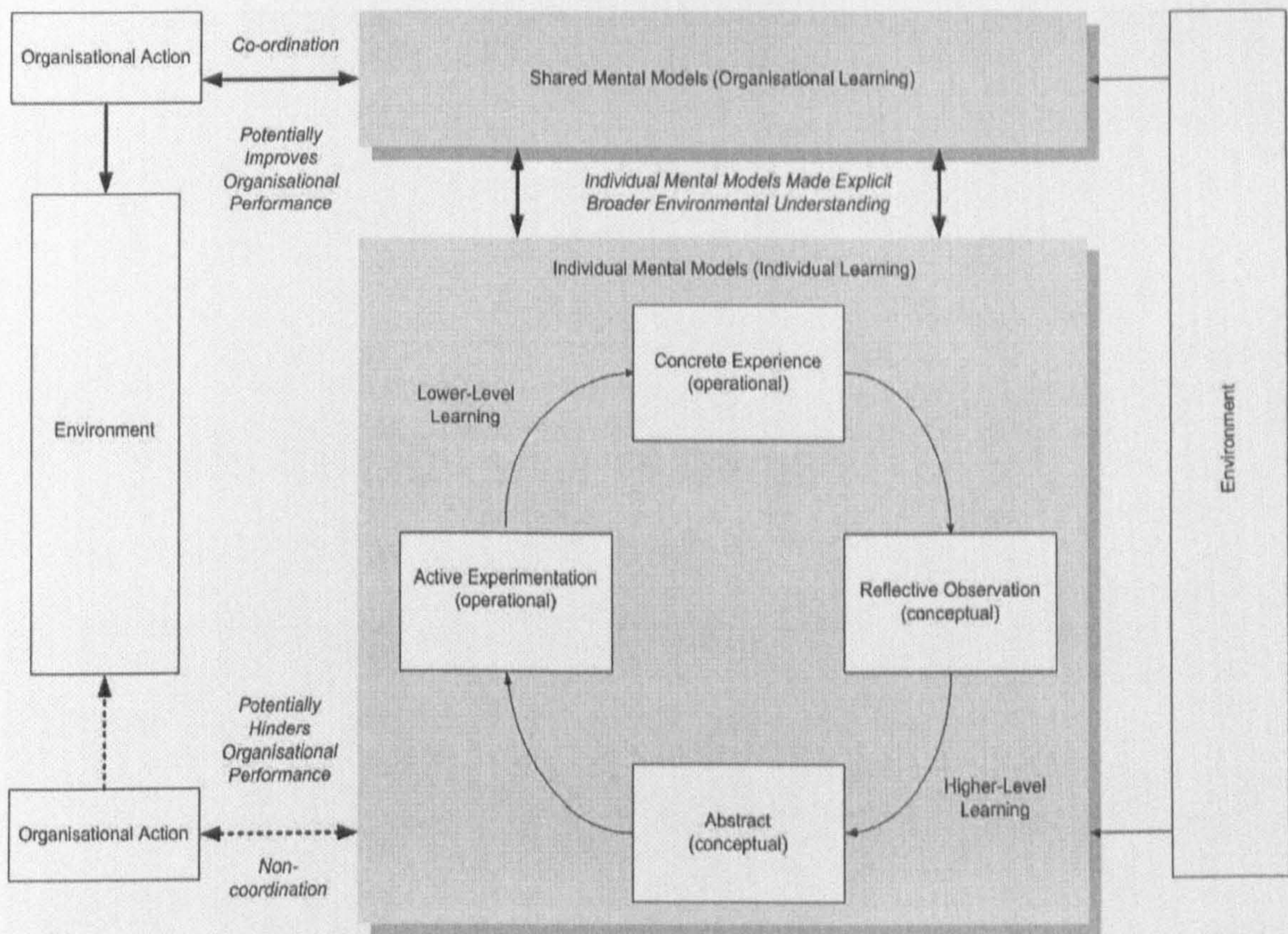


Figure 11.1: Organisational Learning/Organisational Performance Model

11.3 OVERALL DISCUSSION AND CONCLUSIONS

The aim of the research was to provide insights into the process of OL and evidence for the value of OL in contributing to organisational performance improvement. Hence, the following discussion will integrate the results, analysis and discussion of the four studies and provide conclusions for the process and value of OL.

The basis of the relationship between OL and organisational performance proposed was that at the second interview the shared mental map would have improved in similarity to the top manager(s) to a greater extent than the individual managers.

Table 11.1 provides a summary:

Table 11.1: Summary of Mental Map Change

Rank (Improvement in similarity with Top Manager)	Management Team	1st Interview	2nd Interview	Increase/decrease in Similarity
<i>A</i>				
1	<i>SMM</i>	0.650	0.558	14% (convergence)
2	<i>M3</i>	0.549	0.495	10% (convergence)
3	<i>M1</i>	0.722	0.669	7% (convergence)
4	<i>M2</i>	0.525	0.636	21% (divergence)
<i>B (Director 1)</i>				
1	<i>M3</i>	0.510	0.536	3% Divergence
2	<i>M2</i>	0.480	0.527	5% Divergence
3	<i>SMM</i>	0.430	0.504	17% Divergence
4	<i>M1</i>	0.456	0.556	22% Divergence
<i>B (Director 2)</i>				
1	<i>M3</i>	0.481	0.542	13% Divergence
2	<i>M2</i>	0.473	0.559	18% Divergence
3	<i>SMM</i>	0.468	0.606	29% Divergence
4	<i>M1</i>	0.436	0.624	43% Divergence
<i>C</i>				
1	<i>M1</i>	.855	.639	25% Convergence
2	<i>SMM</i>	1.000	.758	24% Convergence
3	<i>M3</i>	.764	.602	21% Convergence
4	<i>M2</i>	.643	.779	21% Divergence
<i>D</i>				
1	<i>M2</i>	0.611	0.458	15% convergence
2	<i>M1</i>	0.636	0.627	3% convergence
3	<i>M3</i>	0.530	0.778	25% divergence
4	<i>SMM</i>	0.588	0.749	27% divergence

The results demonstrated that in only study A did OL improve the similarity between the departmental management team and the top manager a greater amount than any of the individual managers achieved. For study B, the learning of two individual members of the management team resulted in a greater similarity improvement (same result when compared to two top managers) between these individuals and the top managers in comparison to OL. One individual converged marginally more than the shared mental map in study C and for study D, OL resulted in a shared mental map that displayed the greatest amount of divergence from the top manager. These figures and the consequent analysis exhibited a notable result in the fact that OL can result in a greater improvement in similarity between the management team and top manager(s) in comparison to any particular individual member of the management team. Conversely,

OL can result in a shared management team understanding that becomes more dissimilar to that of the top manager than any individual member of the management team. The implication is that there is value in the concept of OL, but also a cautionary note.

The literature review revealed that as a result of the ambiguity surrounding the OL concept, not only was the relationship between OL and organisational performance by no means clear, it is not even agreed whether OL is desirable. Whilst the more prescriptive literature (*e.g.* Crossan *et. al.*, 1999; Kim, 1993; Senge, 1990) advocated OL as being crucial to organisational performance, the more descriptive literature (*e.g.* Huber, 1991; Brown & Duguid, 1991) also warned of the dysfunctional outcomes that can occur as a result of OL. The evidence of this research reflects both perspectives in the fact that it has been demonstrated that OL can be more significant in creating shared understandings than any one individual, but can also create dysfunctional shared understandings. These dysfunctional outcomes are defined as a shared understanding that differs from the top manager(s). Drawing from the analysis of the study results and the literature it is possible to gain insights into the reasons behind the value and dysfunctional aspects of OL.

11.4 THE VALUE OF ORGANISATIONAL LEARNING

Study A demonstrated that OL provided more similar understandings across the area and top managerial levels than was achieved by any of the individual area managers. Reasons for this were revealed to be that the contribution to performance improvement factors included in the shared mental model at the first interview had changed by the second interview. Some of the concepts held by one area manager who most significantly differed from the top manager were filtered out by the second

interview and replaced by another area manager who was the most similar to the top manager at both interviews. This observation was also evident in the results of study C, although in this instance, it was not the replacement of concepts that improved the similarity of the shared mental model. For organisation C, at the first interview the shared mental map contained no concepts in common with the top manager and was dominated by two departmental managers. It was the inclusion of concepts from the third manager at the second interview that caused the improvement in similarity. Both of these studies support the rationale of the developed OL/OP model and assumptions evident in the work of, amongst others, Senge (1990), Dixon (1994), Stata (1996), Spicer (2001), Crossan *et. al.*(1999), Gnyawali and Stewart (2003), Campbell and Armstrong (2005) and Lick (2006). Firstly, in study A, OL had resulted in the replacement of some of the concepts originally included in the shared mental map that were in disagreement with the top manager with concepts that agreed. Secondly, study C displayed an increased complexity in the shared mental map at the second interview that mediated the dominant influence of two managers whose mental maps were significantly different to the top manager. In this case the OL processes have, rather than replaced, added additional concepts that have improved the agreement with the top manager. The connotation of both results is that the OL processes have led to a broader understanding of the department's role in organisational performance improvement.

Boland *et. al.* (1996) recognised that distributed cognition involved individuals making interpretations of their situation and exchanging these interpretations with others whom they have interdependencies so that each may act with an understanding of their own situation and that of others. Indeed, the rationale of the relationship between OL and organisational performance was not only that the subordinates learn from the top managers, but that the top managers also learn from the subordinates to develop a

more thorough understanding of the organisations external and internal environments.

Figure 11.2 is a reproduction of Figure 5.1:

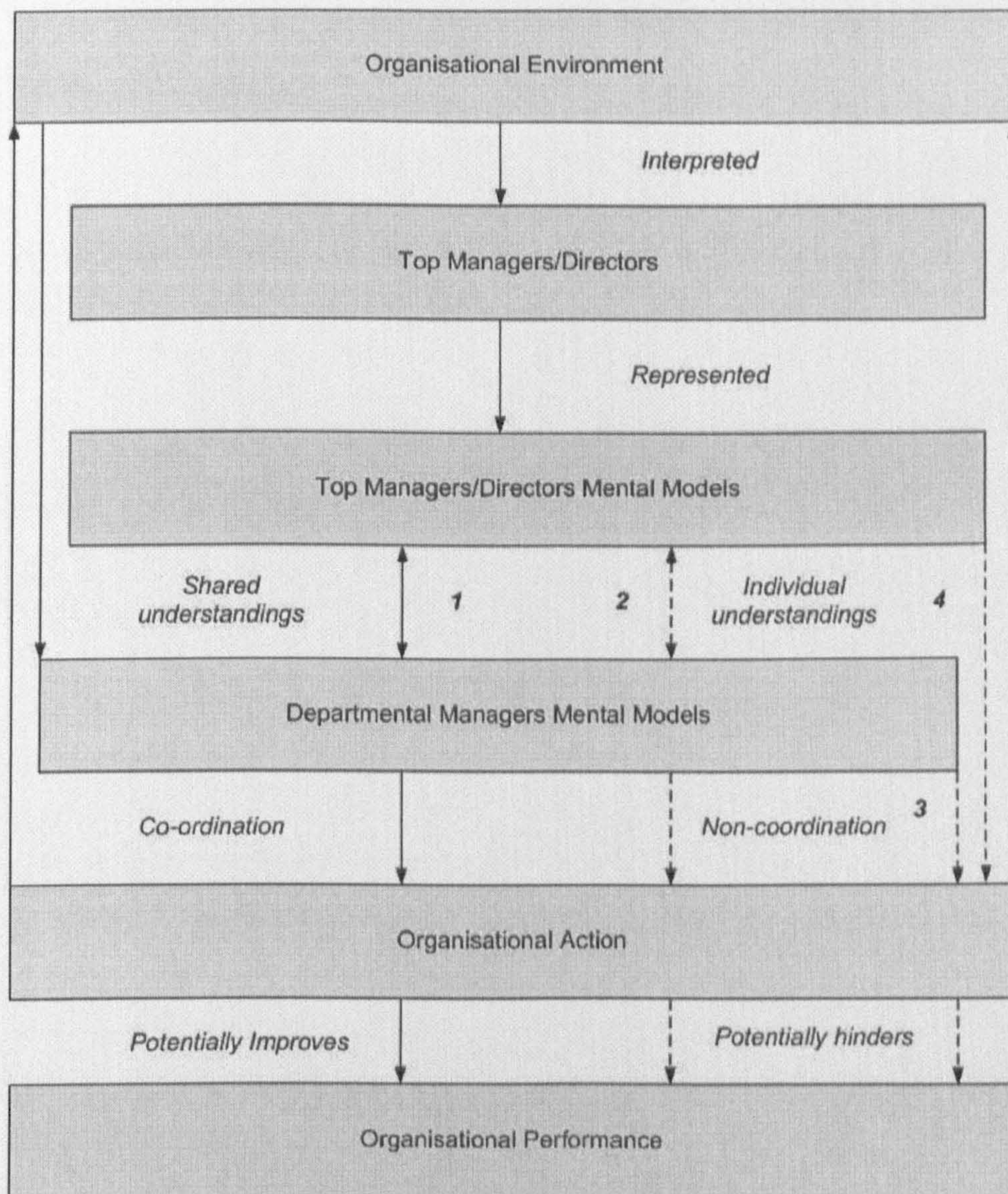


Figure 11.2: The Steps from an Organisations Environment to Potentially Improved Organizational Performance

The diagram developed from a recognition that it is primarily the responsibility of the top managers to interpret and respond to the environment and the influence of top management on organisational performance has been widely recognised (*e.g.* Hambrick and Mason, 1984; Priem, 1994; Lohrke *et. al.*, 2004). It was also claimed that top management understands and interprets the organisations environment via mental

models (Mintzberg *et. al.*, 1998; Porac and Thomas, 1990). Similarly, departmental managers develop mental models of their own operative domains according to what is required to succeed (Laukkannen, 1994) and it is the function of OL to create a shared understanding across these levels. There was evidence in the analysis that not only do the departmental managers learn from the top managers, the reverse does also occur. Study A provides an example of this. The improvement in shared mental map similarity has been identified to be because of a replacement of some of the concepts held by Manager 1 with concepts held by Manager 3. A further reason for the increase in similarity was that the top manager had changed her mental map by the second interview comparatively significantly to become more similar to Manager 3, whereas Manager 3 changed comparatively little by the second interview. Therefore, there is evidence that OL does involve a reciprocal process of learning across the levels rather than simply agreeing the concepts espoused by the top manager.

11.4.1 Dysfunctional Aspects of Organisational Learning

As well as potentially developing a shared understanding that is greater than a manager-top manager dyad can achieve, the results have alluded to the dysfunctional aspects of OL. At the second interview, the shared mental map of study B had diverged in similarity from the top managers to a greater degree than two of the individual managers. The divergence from the top managers occurred because the top manager's mental maps changed extensively by the second interview, incorporating new concepts such as product diversification that did not appear significantly in the top manager's mental maps at the first interview. The shared mental map did not reflect a similar amount of change and hence, became more dissimilar. What is most notable about the management team in this study was the cohesiveness of the manager's mental maps at

both interview stages. The individual and shared mental maps do demonstrate change at the second interview (to a lesser degree than the top manager's) but are tightly grouped at both interviews and show the greatest amount of inter-group similarity of all the studies. Further, the shared mental map at both stages displays a relatively even influence of all three managers. The result was a shared mental map that did not develop significantly differently to any of the individual manager's. Fiol (1996) noted that the OL process relies on the development of rich cognitive maps and a realisation that although OL relies on consensus for organised action to result, it also relies on individual divergence in terms of developing new and varied interpretations of events and situations. The connotation in this instance was that as OL derives from individual learning, the individual manager's mental models did not contain a sufficiently diverse range of concepts for the OL process to be able to create shared understandings more widely than the management team. The reason why the individual managers' mental models did not contain significant diversity can be explained by the fact that cohesive mental models can act as a barrier to learning and accepting new concepts (Hall, 1976, 1984; Hedberg and Jonsson, 1977; Barr *et. al.*, 1992 Mohammed and Dumville, 2001). The notion of cognitive inertia argues that once formed, mental models can serve to filter new information in such a way that individuals and groups become impervious to the need for change (Hodgkinson and Sparrow, 2002).

This case highlighted a marked difference between the top managers and departmental managers. It has been noted that an active reciprocal exchange between levels was evident in study A. However, B reveals a definite separation of thinking between the managerial levels and those shared understandings that were apparent at the first interview have decreased by the second interview.

Study D was the starkest demonstration of the dysfunctional aspects of OL. The shared mental map at the second interview had diverged from the top manager to a greater extent than any of the three individual managers. However, the analysis of the shared mental map development revealed the study actually supported the principles of the OL/OP model by having replaced the manager's concepts that were most dissimilar to the top manager with those held by another manager that had greater mental map similarity. The cause of the shared mental map dissimilarity was found to be that the shared mental model, at the second interview, was dominated by concepts that the top manager deemed important at the first interview. By the second interview the mental map of the top manager had significantly changed. The individual managers became comparatively more similar to the top manager than the shared mental map because these new concepts appeared (in varying degrees) in the individual mental models. What had effectively occurred was that the shared mental map changed, however, the new concepts that were validated were outdated. The result again alludes to cognitive inertia, but this time at the collective level. The inference was that shared mental models can be slower to change than individual mental models (Klimoski and Mohammed, 1994).

The research, therefore, concluded that there is value in the OL concept and the process should be fostered in organisations for potentially improved organisational performance which provides empirical support for the concept that was argued to be lacking (*e.g.* Kofman and Senge, 1995; Baird *et al.*, 1999; Yeo, 2002; Lopez *et al.*, 2005). However, the research has also concluded that there are potential barriers in the process of OL and these must be recognised and addressed for effective (in terms of creating functional shared understandings) OL to occur.

The concept of learning levels was well documented in the literature as distinguishing between more practical, routine, adaptive learning and more fundamental learning that generates new understandings and new cognitive theories for action that force individuals to question their established ways of doing things (Cope, 2003).

This research utilised the definitions of Fiol and Lyles (1985 p.810):

Lower-level learning: Focused learning that may be mere repetition of past behaviours— usually short-term, surface, temporary, but with associations being formed. Captures only a certain element . . . Single loop, routine level.

Higher-level learning: The development of complex rules and associations regarding new actions. Development of an understanding of causation... Double loop learning. Central norms, frames of reference and assumptions changed.

Accordingly, higher-level learning would be expected to change mental models to a greater extent than lower-level learning. The literature also predominantly recognised that both levels are necessary for organisations because lower-level learning is appropriate to guide the everyday behaviours of the organisation, whereas the implications for the new understandings achieved through higher-level learning are to promote the attainment of radical change, innovation and long-term success (Senge, 1990; Appelbaum and Goransson, 1997; Fiol and Lyles, 1985; Argyris and Schon, 1978). Sadler Smith *et al.* (1999 p.881) argued that it was difficult to classify these levels as “...identifying where adaptive learning stops and generative learning starts is difficult and often relies to a certain extent upon the subjective assessment of the analyst”. This research has demonstrated that although there are certain cases where a distinction would be difficult and a subjective assessment would have to be made, other cases display a comparatively large (or small) change over the interviews and a distinction between higher and lower-level learning can be reasonably made.

The distance, MDS and HCA results over the four studies display large differences in both individual and organisational learning (e.g. see Figure 10.1.2, Senior Manager) and

smaller differences (e.g. see Figure 10.1.2, Manager 3). As lower-level learning is likely to change a mental model in a small way as information is processed that is a close repetition of what has been done before and higher-level learning is likely to lead to a larger change in a mental model as this leads to new understandings, an indication was given as to the level of learning. Although a degree of subjectivity must be recognised, it can be concluded that the research has identified a method that can be used to reasonably identify higher and lower-level individual and organisational learning.

11.5 MANAGERIAL IMPLICATIONS

A primary conclusion of this research was that OL is a concept that can potentially produce broader organisational understandings that support the business in comparison to individual learning. The implication for managers was that OL should be fostered within organisations by providing the opportunity for individuals to learn and then articulate this learning to others in the organisation. Allowing the sharing of individual cognition through processes identified in the literature such as dialogue (Senge, 1990), communities of interaction (Nonaka and Takeuchi, 1995), negotiations and arguments (Langfield-Smith and Wirth, 1992), information sharing and transfer (Huber, 1991) can create a functional shared vision of what is required for organisational performance improvement and the individual's role in achieving this. The literature also offered proposals on how an effective learning environment can be created. The adoption of flat, decentralised organisational structures, team working, reward systems that centre on learning goals, and participation in decision making are some cited examples of how organisations can create effective learning environments (Armstrong and Foley, 2003; Garvin, 1993; Watkins and Marsnick, 1993). Lick (2006) draws attention to enhancing OL by the use of collaborative processes such as learning

teams and professional learning communities. These efforts are part of what Beverlein (2003) defines as collaborative work systems in which a conscious effort has been made to create strategies, policies and structures and institutionalise values, behaviours and practices that enable individuals and groups to effectively work together to achieve desired results and organisational goals.

However, the results also display that OL can become dysfunctional and cause the development of a shared understanding amongst the managers that does not support the ideas of organisational performance improvement that the top managers propound. It cannot be assumed that if individuals are brought together to share learning that a shared mental model will develop that drives the organisation's strategies. This conclusion concurs with the warning advanced by Shipton (2006) that noted much of the literature which advocates open communication has to some extent masked the problems and difficulties associated with learning. Barriers to functional OL in this research were identified as being cognitive inertia leading to a lack of diversity of concepts within individual mental models and also leading to shared mental models being slow to change. The latter is a particular concern for organisations as it has been noted that organisations are facing unprecedented levels of change (Burnes, 2005) and OL proponents have promoted OL as being valuable because it allows organisations to change faster than competitors (*e.g.* De Geus, 1988; Stata, 1989). However, the essence of the OL process was that it is a dynamic process of sharing and validation that challenges existing cognitions. The process relies on the development of rich cognitive maps and a realisation that although OL relies on consensus for organised action to result, it also relies on individual divergence in terms of developing new and varied interpretations of events and situations (Fiol, 1996). For organisations, attention needs to be paid to realising OL is a dynamic process that must regularly challenge existing

cognitions if rich, diverse and constantly changing shared mental models are to develop and overcome cognitive inertia and slow change. For managers, the task is to diagnose when individual and shared mental models have developed that both support the strategies of the business and when they do not.

The research has also identified a method of diagnosing learning levels within an organisation and it would be a useful exercise for managers to audit the extent of different learning levels and decide whether this is appropriate for the organisation. The literature provides a guide which states that lower-level learning is appropriate to steer the everyday behaviours of the organisation, while the implications for the new understandings achieved through higher-level learning are to promote the attainment of radical change, innovation and long-term success (*e.g.* Senge, 1990; Appelbaum and Goransson, 1997; Fiol and Lyles, 1985; Argyris and Schon, 1978).

11.6 SUMMARY

The findings of the four studies were integrated to provide a discussion of the overall results and draw major conclusions. Primarily, it was concluded that there is value in the OL concept and the process should be fostered in organisations for potentially improved organizational performance. However, the research has also concluded that cognitive inertia is a potential barrier in the process of OL and this should be recognised and addressed.

Subsequent to the overall discussion and conclusions, managerial implications of these were outlined. It was proposed that allowing for individual mental models to be made explicit and shared through, for example, fostering open communication and dialogue was important, but it must be recognised that this alone will not assure functional OL. The process must be monitored to be able to recognise when individual

and shared mental models develop that don't align with, or support, the strategies of the top management. Finally, the implications of identifying higher and lower-level learning means that these can be diagnosed in organisations and decisions made if these levels are appropriate for the organisations needs and strategies.

CHAPTER 12

12. Contribution to Knowledge

12.1 INTRODUCTION

The following chapter revisits and answers the research questions to provide a framework to summarise the major and minor contributions to knowledge of the research. Fundamentally, the research has contributed to the OL field by providing evidence for the value of OL and has aided the delineation of the process.

12.2 REVISITING THE RESEARCH QUESTIONS

Research Question 1: By analysing individual experiential learning what insights can be gained into the OL process?

The research placed the individual firmly as the focus of OL and proposed that individuals are the only organisational actors capable of learning by means of mental activity, a position common to a number of OL authors (e.g. Argyris and Schon, 1978; Senge, 1990; Kim 1993a; Spicer, 2001; Hodgkinson, 2000; Spector and Davidsen, 2006). The proposition was that by analysing individual learning, insights can be gained into the process of learning at the organisational level. The shared mental model is formed from individual mental models and therefore individuals influence its formation and content. The results of this research have displayed the integral nature of individual learning on OL. For example, the creation of a functional (aligned with the top manager) shared mental model in study A was due to the decline in influence of a manager who was at odds with the top manager and increase in influence of another manager who displayed greater similarity. C demonstrated that the inclusion of a manager's mental model concepts at the second interview, who exhibited little influence at the first

interview, improved the shared understandings. OL can filter out idiosyncratic individual concepts that have not been validated to result in a more unified vision of organisational performance improvement. Conversely, the study has revealed that individuals can cause barriers to functional OL.

Research Question 2: Can higher-order and lower-order learning be identified and categorised in organisations?

The methods utilised for this research identified that over the four studies large differences in both individual and organisational learning (e.g. see Figure 10.1.2, Senior Manager) and smaller differences (e.g. see Figure 10.1.2, Manager 3) are evident by interview 2. It was argued that lower-level learning is likely to change a mental model in a small way as information is processed that is a close repetition of what has been done before and higher-level learning is likely to lead to a larger change in a mental model as this leads to new understandings. Although a degree of subjectivity must be recognised, it can be concluded that the research has identified a method that can be used to reasonably identify higher and lower-level individual and organisational learning.

Research Question 3: As organisational learning occurs through individual experiential learning, is it possible to represent OL by amalgamating common components of individual mental models?

Although individuals have been deemed as important agents of OL, it was contended that learning must also encompass the organisation and not simply be the sum of individual learning (e.g. Cyert and March, 1963; Dodgson, 1993; Fiol and Lyles, 1985; Huber, 1991; Kim, 1993b; Levitt and March, 1988). Kim (1993b p.37) made the

distinction clear by stating that organisations can learn independent of any specific individual. For this research to claim to be capturing OL, a distinction between individual learning and OL must have been evident. The literature review outlined that when moving to the level above the individual, collective mental models develop (e.g. Axelrod, 1976; Klimoski and Mohammed, 1994; Prahalad and Bettis, 1986). These collective mental models (known in this research as shared mental models) contain the common concepts and relationships between concepts of individual mental models and develop from groups of three or more members. To be able to validate the proposed formation of shared mental models and represent OL as being a change in these shared mental models, they needed to develop as a unique entity, quantitatively different to any individual mental model. The shared mental maps elicited in all cases differed from any one individual manager and developed differently, and to differing extents than any individual manager. The results and analysis have supported the proposal that OL can be represented by amalgamating common components of three or more individuals' mental models that are focused on organisational action over time.

Research Question 4: By analysing individual learning over time, can OL be measured?

The distinction evidenced between individual and OL means that the representation of OL utilised in this research provides a method for the measurement of OL. In an organisational context, individual mental models can be elicited and represented by utilising causal cognitive mapping and shared mental maps constructed at any point in time. OL is then measured by analysing the variation between shared mental maps at different points in time. The mathematical formula outlined in this research allows for a value to be calculated as to the degree of difference between the shared mental maps and therefore, a measure of OL.

Research Question 5: Can these OL representations and measurements be deconstructed to analyse the formation and development, and hence process, of OL?

The measure of OL results in distance data that reveals not only whether OL has led to an improvement in shared understandings, but also the individual learning of the participants and how these entities lie with respect to each other. Multi-dimensional scaling (MDS), hierarchical cluster analysis (HCA) and analysing the content of the shared mental map allow for an investigation into how the shared mental model formed and how it developed over time to give insights into the OL process. For example, it can be revealed whether individual managers' mental models significantly differ with respect to each other and consequently an indication of the cohesion of the management teams thinking. Further, it can be revealed which individuals are proportionately displaying a greater influence on the shared mental model and whether this influence is supporting the organisation.

Research Question 6: As potentially improved organisational performance is dependent on the formation of a shared vision through OL processes, can the shared vision be represented and measured and hence, OL linked to potentially improved organisational performance?

The research has provided a method of representing and measuring the shared vision in the study organisations by comparing the top managers' mental maps with the shared mental map of the departmental managers. As the literature predominantly argues that establishing a shared vision is necessary to form the basis for unified action and consequent improved organisational performance (e.g. Van der Heijden and Eden, 1998; Senge, 1990; Spector and Davidsen, 2006), a link to potentially improved organisational performance has been established. However, the literature review

recognised circumstances in which a shared vision may not drive organisational performance improvement. For example, top managers may incorrectly interpret the environment and an inaccurate shared vision develops (Fahey and Narayanan, 1989).

Therefore, the proposition was that OL can potentially improve organisational performance, rather than will improve organisational performance. The principles of the OL process described was, however, that it is a dynamic process of sharing, negotiation and validation that challenges existing cognitions and makes incorrect learning less likely than with individual learning alone.

Research Question 7: Does OL lead to potentially improved organisational performance in comparison to individual learning?

The results of, particularly, study A, and elements of study C, reveal that OL can lead to a shared understanding of organisational performance improvement that is greater in similarity than the individual-top manager dyads. Therefore, the greater similarity in thinking, or shared vision, can potentially improve organisational performance through coordinated action to a greater extent than isolated individual learning. However, organisations B and D expose that OL can potentially create a shared vision that does not support the top managers conceptions of organisational performance improvement and in these cases, individual managers displayed greater similarity and hence, potential to act in a coordinated manner.

Research Question 8: Should organisations foster OL processes or concentrate on individual learning?

The results demonstrate that OL can create a shared understanding across a management team and top manager that is more similar than any manager-top manager

dyad and so a greater likelihood of coordinated organisational action and performance improvement. The value of OL has been supported and it was therefore concluded that OL processes should be fostered. However, it needs to be recognised when OL is causing the development of shared mental models that do not align with the top managers understanding of what the organisation must do to improve performance.

12.3 MAJOR AND MINOR CONTRIBUTIONS TO KNOWLEDGE

12.3.1 *Major contributions to knowledge*

The literature predominantly promoted OL as being a crucial concept for organisational success or even survival. Senge (1990) advocated OL as being a major source of competitive advantage for organisations in the future and after reviewing the OL literature of the time, Dixon (1992 p.29) wrote that learning is “the critical competency of the 1990’s”. Hayes and Allinson (1998 p.847) propounded that, “The quality of individual and collective learning is a key determinate of organizational success”. More recently, Friedman *et. al.* (2005 p.19) recognise the importance of the OL concept by stating that, “Today there seems to be little question that organizations can learn and that learning is essential for long term survival”. However, concomitant with these claims was a growing call for validation of the claims attributed to OL. The recognition of the need for more empirical studies in the OL field dates back at least as far as Fiol and Lyles (1985) and has remained a consistent call for over twenty years (*e.g.* Fiol and Lyles, 1985; Huber, 1991; Miner and Mezias, 1996; Easterby-Smith and Araujo, 1999; Arthur & Aiman-Smith, 2001 Dyck *et. al.*, 2005). A major contribution of this research was to provide evidence that addresses the call for more empirical studies, and particularly research into the notion that OL leads to organisational performance improvement that was identified as being lacking in the OL literature (*e.g.*

Kofman and Senge, 1995; Baird *et al.*, 1999; Yeo, 2002; Lopez *et al.*, 2005). Further, the limited empirical research that exists examining the OL/Organisational performance relationship is predominantly grounded in behavioural psychology (*e.g.* Crossan *et al.*, 1999; Bontis *et al.*, 2002; Arthur and Huntley, 2005; Skerlavaj *et al.*, 2007). However, it has been argued that this perspective does not sufficiently capture the complexity of the learning process. A major contribution of this research was to provide an empirical examination of the OL/Organisational performance relationship from a cognitive perspective.

Developing a research model to be able to study the OL/ organisational performance relationship has aided the clarification of how OL can yield improved organisational performance. The model construction process has contributed to the ‘demystification’ of OL which Friedman *et al.* (2005 p.27) alluded to when calling for “developing models that create clear and observable links between concepts and organizational action”. Essentially, the research has provided evidence to help address the call for, “... a stronger and more cogent discussion on how learning can yield performance” (Bapuji and Crossan, 2004 p.410).

Specifically, the results demonstrated that there is value in the OL concept and provided support for the advocates of OL. However, the results also lend a cautionary note and warn of the dysfunctional aspects.

12.3.2 Minor contributions to knowledge

The identification of methods to represent and measure OL presents a minor contribution to knowledge. Easterby-Smith and Lyles (2003) recognised that experts in the field of OL agree on many emerging areas and that of critical importance is the development of better methods for measuring learning processes and knowledge and for

evaluating the impact of learning on organisations and their performance. Indeed, the slow growth in empirical research had been cited as being partially due to the lack of valid and reliable measures (Easterby-Smith *et al.*, 2000).

Additionally, the cognitive methodology outlined in this research, in comparison to the behavioural methodologies, can be argued to be a deeper and more valid, conceptualisation of learning (Hodgkinson and Sparrow, 2002). The methods also contribute to allaying the commonly expressed criticism that OL does not provide ‘useful’ knowledge for practitioners (Prange, 1999). For example, the methods could be used in organisations to diagnose whether shared mental models have developed that support the objectives and strategies of the organisation. A further contribution and potentially beneficial managerial application of the methods is to provide an indication of higher and lower-level learning. The concept of a hierarchy of learning levels has developed from an established pedigree into an important arena of examination into both individual and OL (Visser, 2007). It is generally agreed amongst learning-level theorists that the extent of higher versus lower-level learning is deemed as important for favourable organisational outcomes (*e.g.* Argyris and Schon, 1978; Fiol and Lyles, 1985). Therefore, the identification of a method that gives an indication of the level of both individual and organisational learning is a useful contribution to the literature and managerial practice.

CHAPTER 13

13. Limitations and Further Research

The basis of this research was entrenched in the cognitive perspective of OL with the focus firmly on individual cognitive processes. Laukkanen (1994) claims that whoever seriously engages with cognitive management and organisation research will soon learn to appreciate the complexity of the processes and phenomena that comprise human cognition. As cognition refers to the individual, group and organisational level phenomena related to knowing, i.e., to questions regarding the acquisition, types and use of human knowledge, the difficulty of accurately representing and analysing these cognitions is evident. Whatever representation tool is chosen, the result is assumed to represent the subject's unseen cognitive constructs. Whilst there is nothing unusual about this process in the fact that most days we will attempt to infer other peoples thinking from the language they use, it cannot be possible to know if we have fully and exactly represented and described an individual's cognitions. The basis of this research is predicated upon the premise that individual cognitive change is representative of learning and that this cognitive change can be represented and measured. In essence, the research rests on the assumption that mental maps are accurate representations of an individuals mental models, an assumption that, at least at the present time, cannot be proven. For example, one manager identified a factor for organisational performance improvement as being replacing the existing top management. It is possible that this manager was using this opportunity to make a point rather than seriously examining his mental models. It is therefore prudent to advise caution about claims of what has actually been captured empirically and analysed in this research. It is very difficult to validate claims by

showing definite links between a representation (cause map) and some cognitive theoretic construct such as a mental model (Laukkanen, 1994).

The link established from OL to organisational performance rests on the desirability of developing a shared vision in the organisation and how this provides the likelihood of unified action. The link was built on established arguments in literature such as strategy, change, OL and the learning organisation. It must be recognised that establishing a shared vision is unlikely to automatically cause an increase in organisational performance and there may be more proximate reasons for an increase in organisational performance such as a favourable change in the environment. Further, although the literature predominantly argues for the benefits of a shared vision, there is a body of literature that argues against a shared vision based on the argument that this vision can act to constrain the organisation and affects its ability to change. Therefore, the research can only claim that OL has the potential to improve organisational performance and relies on other literature to support the performance link.

It was contested that what makes a change in the shared mental models of three or more organisational members 'organisational' learning is the fact that the learning is at a level above individual learning, develops as a unique entity and the resultant action based on this will (to varying degrees) affect the organisation. The research then used departmental management teams of three based upon this argument and the fact that the process of OL will be more apparent in groups of three rather than larger groups where issues such as individual influence will be diluted. Further research would be useful in determining whether the results of this research can be supported when larger numbers of individuals are involved. This research could focus on the potential for larger groups to be more or less effective at OL because there must be a lessening of the either desirable or undesirable influence of any particular individual.

A method of measuring higher and lower-level learning at both the individual and organisational levels has been identified. Whilst interpreting the results does, to a degree, depend on the subjective assessment of the analyst, it would be useful to undertake further research into this often cited topic. For example, an analysis of the extent of these learning levels within study organisations and whether this fits with the organisations strategies and context. Alternatively, an examination into whether the different learning levels can be deemed to be quantitatively better than the other could be undertaken by comparing the levels in different organisations displaying differing performance outcomes.

This research has measured and analysed the process of individual and organisational learning in study organisations and has concluded that OL has the potential to support the organisations vision of how to achieve performance improvement to a greater extent than any one individual. The research did not seek to analyse the antecedents of OL in the study organisations and give specific recommendations that it was for example, a flat organisational structure, access to information, the size of the organization, power relations or any of many different possible factors that caused OL to be functional, or not, in the study organisation. However, researching these antecedents to help find out why the organisations gave the results they did would be insightful. For example, in organisation B, the production management team remained very similar in its conception of performance improvement at both interview stages, whereas the top managers changed significantly by the second interview. The major change in the top managers understanding of departmental contribution to performance improvement was a change from a focus on customer requirements to product diversification, the result of some success in a new market for the firm. However, although the production managers must have known about this

development (primarily as they made the new products), the concept appeared, but not significantly, in any of the individual managers' mental maps. There was an obvious resistance to the new strategy and it was inferred by the researcher that this was primarily because it meant the production department would have to undergo a significant change if this strategy was implemented. Based upon this, future research could further elaborate on the formation and influence of cohesive mental models on OL. For example, this organisation was the smallest of the four studies and the top managers and production managers knew each other well and communicated regularly during the day. This meets the recommended criteria for having the opportunity to express individual mental models. However, the regular communication between the production managers may have led to the formation of the strongly held shared mental model that proved difficult to change. This context could also potentially mean a greater opportunity for barriers to develop such as few new ideas leading to a lack of cognitive diversity. Researching a greater number of small and medium sized firms would contribute to understanding these, and related OL issues, in not only the SME context, but also potentially provide insights for the wider organisational realm.

Organisation D also gives indications of further research directions. The results of this organisation demonstrated that the OL process did filter out idiosyncratic ideas that were at odds with the top manager. However, the consequence was that at the second interview the shared mental map had developed to become more similar to the top manager at the first interview. By this time, the top manager had moved on and changed his mental map. The individual managers' mental maps demonstrated these new concepts held by the top manager at the second interview to a greater extent than the shared mental map. The implication was that the shared mental model was slower to change than the individual managers. This management team was the most disparate of

all of the cases in terms of the contact that they maintained with each other because of the large size of the organisation. The slow change in the shared mental map may have been due to the irregular contact with the other two managers. Further research could look at the relationship between the frequency/methods of communication and the rate of change of individual, compared with shared, mental maps.

The aim of the research was to empirically study the process of organisational learning and evaluate the value for organisational performance improvement. It is recognised that further research is needed be able to entirely clarify the process and value of OL.

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15. Appendices

15.1 APPENDIX A: ORGANISATIONAL QUESTIONNAIRE

Initial questionnaire to select case studies

The Relationship between Organisational Learning and Performance

In a rapidly changing business environment it is claimed that knowledge - not natural resources, machinery, or even financial capital - has become the one indispensable asset of corporations and attaining this knowledge through individual and organisational learning has been advocated as the only real source of competitive advantage. This research project seeks to explicate this widely held belief.

*Please note that this questionnaire is entirely confidential
Please do not include your name or the name of your company*

Please give as much information as you can as this will greatly aid the validity of results

Section 1: Background

1. Broadly outline your companies business and competitive environment
2. Briefly outline the structure of the company (particularly focussing on the departments that make up the company and approximately how many employees in each) - *if this is more easily answered by attaching an organisational chart, then please do so*
3. Outline your role in the department that you are a part of, or if your organisation is further divided into teams, the role you play in the team. How many other people are in this department or team? What roles do they play?
4. Briefly outline any significant changes (in your opinion) that your organisation and / or department has undergone over the past 1-2 years. If nothing of significance, please go to the next section.

Section 2: It is important that this section relates to your own thinking, ideas, and opinions. Therefore, please answer based entirely on what you believe, which may, or may not be in line with organisational policy. Further, please include 'off the top of your head' type ideas, even if you think they are off the topic or unimportant.

1. What do you believe are the key success factors for your organisation? *Please list as many key words or phrases that you can think of:*

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Please add more if necessary:

2. What do you believe are the key success factors for your department or team that you are a part of? *(Some of these may be in common with the previous list)*

Key success factor 1:

How does, or if not currently achieving this, can your department or team meet this key success factor?

How does this key success factor improve your department or team's performance?

Key success factor 2:

How does, or if not currently achieving this, can your department or team meet this key success factor?

How does this key success factor improve your department or team's performance?

Key success factor 3:

How does, or if not currently achieving this, can your department or team meet this key success factor?

How does this key success factor improve your department or team's performance?

Key success factor 4:

How does, or if not currently achieving this, can your department or team meet this key success factor?

How does this key success factor improve your department or team's performance?

Key success factor 5:

How does, or if not currently achieving this, can your department or team meet this key success factor?

How does this key success factor improve your department or team's performance?

Section 3: Please answer these questions in line with current organisational policy

1. How is your department or teams performance measured? How often?
2. At the time of answering this questionnaire, what is the performance of your department or team according to organisational measures?
3. If comparisons are made between your department (or team) and other departments (or teams), how does your department (team) compare?

Thank you for participating in this research - if there is any further information that you may be able to give (e.g. example performance measurement guidelines, organisation chart etc.) please feel free to attach with this questionnaire

15.2 APPENDIX B: CASE STUDY A - COUNTY COUNCIL RAW DATA SHEETS

Learning Disabilities Service Raw Data Sheets

Learning Disabilities Senior Manager 1st Interview
Anchor themes highlighted in bold

Raw Data Sheet 1 (RDS 1)

	<i>Natural Language Unit (NLU)</i>	<i>Effect (Arrow to effect NLU)</i>	<i>STAG (Standard Term Tag)</i>
1.	Government support	5	B43
2.	Teamworking	6,9	B1
3.	Training	8	B14
4.	Individual accountability	9	B16
5.	Funding	9	B44
6.	All working together to ensure targets are met	9	B1
7.	Constant monitoring of figures	9	B40
8.	Skilled team	9	B4
9.	Targets	5,10,14,11,15, 12,13	B47
10.	Public confidence	5,1	B48
11.	Value for money service provider		B67
12.	Retain excellent status		B77
13.	Development of new services		B66
14.	Reach more LD		B79
15.	User satisfaction		B60
16.	LD awards framework (staff meet)	19	B20
17.	Knowledge of staff	19	B6
18.	Attitudes of staff	19	B5
19.	Skilled staff	24	B4
20.	Meeting QA framework specs	24	B78
21.	Dealing with requests from LD promptly	24	B59
22.	Dealing with complaints properly	24	B80
23.	Comply with protection policies and procedures	24	B46
24.	Quality service	25,26,27,28	B65
25.	LD and carers satisfied		B60
26.	Improved response times	29	B59
27.	Best value		B67
28.	Funding to improve range of services offered		B44
29.	Checked by principal officers	30	B40
30.	Retain excellent status		B77
31.	Resources (money)	32	B44

32.	Training	42	B14
33.	Compulsory involvement	32	B2
34.	Recruitment	42,38	B26
35.	Promoting awareness (of how to work with LD)	38	B79
36.	Workforce planning	42	B26
37.	Increase status in workforce	42	B27
38.	Attitudes of staff	42	B5
39.	Knowledge of staff	42	B6
40.	LD awards framework achieve NVQ level 2 (qualification)	39	B20
41.	LD and carer involvement	42	B56
42.	Skilled team	46,43,44,45	B4
43.	Meet user needs	47,48,49	B61
44.	Quality service		B65
45.	LD and carer satisfaction		B60
46.	Individualised service		B70
47.	Meet targets		B47
48.	Promote independence		B76
49.	Promote inclusion		B76

Raw Data Sheet (RDS 2)

1.	Accountability of team members	9	B8
2.	Teamwork	9,3	B1
3.	Understanding between social and health services	9	B19
4.	Consultation with community team	9	B3
5.	LD partnership board support	4,9	B45
6.	Financial arrangements between partners	9	B82
7.	Agree service objectives	9	B64
8.	Commitment of staff	9,3	B3
9.	Integrated services	10,11,12,13	B50
10.	Efficient process	15	B74
11.	Service quality	16,17	B65
12.	Clearly defines who is responsible for LD		B68
13.	Denied the correct service		B88
14.	Best value		B67
15.	Removes duplication	14	B88
16.	Meet user requirements		B57
17.	Wider LD choice	16	B66
18.	Skills of staff	24	B4
19.	Commitment of staff	24	B3
20.	Involvement of national forum for people with LDs	24	B56
21.	Partnership board	24	B45

	participation		
22.	User involvement in consultations	24,21	B56
23.	Organisational processes	22	B74
24.	Patient led	25,26,27	B71
25.	Develop specialist services		B66
26.	Understand user requirements	29,30	B57
27.	Cost efficiencies (correct service first time)	31,28	B88
28.	User satisfaction		B60
29.	More people helped		B76
30.	Quality of service		B65
31.	Meet targets		B47

Learning Disabilities Senior Manager 2nd Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Partnership boards	5	B45
2.	Consultation with team	1,5	B2
3.	Training	6	B14
4.	Commitment of team members	5	B3
5.	Partnership working	9	B82
6.	Abilities of team	9	B4
7.	Funding	9,3	B44
8.	Government support	7	B43
9.	Achievement of targets	11,12,13,14	B47
10.	Quality of life		B76
11.	Meeting our user needs	10,15,16,17	B61
12.	Providing quality service	11,18	B65
13.	Working as a team	12	B1
14.	Retain funding	19	B44
15.	Cultural awareness		B18
16.	Independence		B76
17.	Inclusion		B76
18.	Consistency of service provision		B62
19.	Expand services		B66
20.	Cultural sensitivities	28	B18
21.	Qualifications	26	B20
22.	Recruitment	26,20	B26
23.	Commitment of providers	24	B30
24.	Teamworking	28	B1
25.	Funding	28	B44
26.	Staff abilities	28	B4
27.	Training	26	B14
28.	Retain excellent rating	30,31,32,33	B77
29.	Confidence in service		B69

30.	Meet user needs	34	B61
31.	Retain control	35	B81
32.	Recognition of achievement	37	B25
33.	Funding		B44
34.	Satisfaction		B60
35.	Imposed systems avoided		B72
36.	Integration (teamworking)		B1
37.	Motivation of staff	36	B7

RDS 2

1.	Consultation with partnership boards	6,9	B45
2.	User surveys	6	B55
3.	Complaints information	6	B80
4.	Cultural sensitivities	10	B18
5.	Consultation with staff	6	B2
6.	Listening to people (LD and carers)	10	B56
7.	Information systems	10	B83
8.	Monitoring quality indicators	10	B40
9.	Precision of QA frameworks	8	B78
10.	Service quality	12,13,14,15	B65
11.	Partnership working	10	B82
12.	Understand minority requirements (ethnic groups)		B18
13.	Meet targets		B47
14.	Responsive to users	16,17	B59
15.	Government support		B43
16.	Meeting requirements		B57
17.	Satisfaction of users		B60
18.	Information systems	21	B83
19.	Integrated working	21	B82
20.	Skills and knowledge of disciplines	19	B4
21.	Response times	22,23,24	B59
22.	Satisfaction of users		B60
23.	Better understand user needs	25	B61
24.	Meet response targets		B47
25.	Develop services		B66
26.	Partnership boards	32	B45
27.	Involvement of users	26,32	B56
28.	Reorganisation 'structural'	27,32,31	B85
29.	Information flow	32	B83
30.	Accountability of staff	32	B8
31.	Commitment of staff	30	B3
32.	Joined up working	33,34,35,36	B82
33.	Quality of service	34	B65
34.	Accurately meet user needs		B61

35.	Cost savings	37,36	B73
36.	Greater service options		B66
37.	Targets		B47

Learning Disabilities Team Manager 1 (OT) 1st Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Teamworking	10	B1
2.	Understanding between disciplines	1	B19
3.	Pay (equality)	10	B17
4.	Legislation	10	B46
5.	Value peoples roles	10	B10
6.	Communication	10	B21
7.	Information between services	10	B83
8.	Systems and processes compatible with joint working	10	B72
9.	Consultation with LD and carers	10	B56
10.	Partnership	11,12,13,14	B82
11.	Involves the quality of LD peoples lives		B76
12.	Identify most appropriate service	15	B65
13.	Users are not passed between services	16	B88
14.	Embraces new ideas		B75
15.	Satisfaction with service		B60
16.	Efficiency	15	B74
17.	Communication	19	B21
18.	Consultation with senior managers	20,21	B41
19.	Understanding between disciplines	23	B19
20.	Valuing peoples roles	23	B10
21.	Valuing peoples input	23	B12
22.	Government established boards support	20,21	B45
23.	Professional identity	24,25,26	B22
24.	Better partnership working		B82
25.	Motivation of staff	27	B7
26.	People feel valued		B23
27.	Service provision (quality)		B65
28.	Funding (ILAs)	32	B44
29.	Identifying individuals needs	35	B24
30.	Recognition	35	B25
31.	Committed team members	35	B3
32.	Resources	35	B49

33.	Recruitment of committed staff	35	B26
34.	Leadership support	35	B28
35.	Training	37,42,38,39,40	B14
36.	Meet user needs		B61
37.	Service quality		B65
38.	Skills of team	37	B4
39.	More qualified staff	43	B13
40.	Culturally aware	37	B18
41.	Teamwork	37	B1
42.	Understand other disciplines	41	B19
43.	Understand LD requirements		B57

RDS 2

1.	Training	5	B14
2.	Systems	9	B72
3.	Discipline understanding	7	B19
4.	Sharing information	7	B83
5.	Skills of team	9	B4
6.	Involvement of users	9	B56
7.	Teamworking	9	B1
8.	Regular interaction with team	7,4	B74
9.	Communication	10,11,15,12,13,14	B21
10.	Increased morale of staff		B9
11.	Integration of disciplines	15	B82
12.	Coherent service provision	16	B62
13.	Increased information flow	16	B83
14.	New ideas for development	17	B75
15.	Service quality		B65
16.	Efficient processes	18	B74
17.	Increase scope		B66
18.	Targets		B47
19.	Restructuring	21,22	B85
20.	Systems	21,22	B72
21.	Participation of users	24	B56
22.	Participation of disciplines	24	B29
23.	Support of partnership boards	24	B45
24.	Consultation	25,29,26,27	B89
25.	Agreed performance measurement	28	B42
26.	Understanding roles		B10
27.	Understanding of user needs	30	B61
28.	Motivation of staff		B7
29.	Recognition of staff contribution	28	B25
30.	Provide the best possible provision		B67

Learning Disabilities Team Manager 1 (OT) 2nd Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Processes	6	B74
2.	Systems	6	B72
3.	Participation	7	B56
4.	Communication	6,8	B21
5.	Valuing people	6	B23
6.	Staff working together	10	B1
7.	Voice of users	10	B56
8.	Commitment of disciplines	10	B30
9.	Understanding of roles	8	B10
10.	Partnership	11,12,13,19,14,15	B82
11.	More efficient	16	B74
12.	Coherent service provision	17	B62
13.	Remove 'double' assessment		B88
14.	One clear access route		B65
15.	Clear responsibility		B31
16.	Cost savings		B73
17.	Give users the best service	18	B65
18.	Quality of life improved		B76
19.	Meet government requirements		B53
20.	Willingness of team	24	B7
21.	National support	26,24	B51
22.	Local support	26,24	B52
23.	Joint training for service managers and professional heads	26	B14
24.	Opportunities for training	26	B15
25.	Funding	24	B44
26.	Training	27,28,29	B14
27.	Quality service	30	B65
28.	Pay for levels of responsibility		B17
29.	Cultural awareness		B18
30.	Meet user needs		B61
31.	Family friendly policies	32	B32
32.	Work/life balance	35	B33
33.	Resources	35	B49
34.	Support of Government	33	B43
35.	Conditions	36,38,37	B34
36.	Motivation of team	38	B7
37.	Morale of staff		B9
38.	Integration of team		B82

RDS 2

1.	Consultation between disciplines	2	B29
2.	Clarification of boundaries	4	B31
3.	Senior management support	4,2	B28
4.	Roles of staff	5,6,7,8,9	B10
5.	Understanding of roles	12	B10
6.	Clear responsibilities	10	B31
7.	Teamworking		B1
8.	Understanding of disciplines		B19
9.	Target training initiatives		B15
10.	Accountability	11	B16
11.	Quality of service		B65
12.	Valued staff		B23
13.	Regular consultations	15	B89
14.	Commitment of staff	15	B3
15.	Involvement of users	20	B56
16.	Systems and records	20	B72
17.	Disciplines working together	20	B82
18.	Access to information	20	B90
19.	More information	20	B83
20.	Communication	21,22,23	B21
21.	Working together	24	B1
22.	Reduces duplication	26	B88
23.	Motivates	24	B7
24.	Service quality	25	B65
25.	User needs		B61
26.	Efficiency	27	B74
27.	Savings		B73

Learning Disabilities Team Manager 2 (SC) 1st Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Teamworking	11	B1
2.	Staff (skills)	11	B4
3.	Development	2	B14
4.	Rewards (PRP)	11	B17
5.	Government partnerships	11	B45
6.	Advocacy support	11	B56
7.	Extend to 24hr service	11	B66
8.	'voice and choice' (involvement of LD and carers)	11	B56
9.	Don't promote unreasonable expectations of service	11	B54
10.	Communication	11	B21
11.	Quality service	12,13,14	B65

12.	Meet government imposed targets	15	B47
13.	LD needs are met	16,17,18	B61
14.	Savings on redundancy		B88
15.	Keep 'excellent'		B77
16.	Inclusion		B76
17.	Independence		B76
18.	Quality of life		B76
19.	Less bureaucracy	28	B86
20.	Authority systems	28	B72
21.	Staff skills	25	B4
22.	Integration of services	25	B50
23.	Political agenda	28	B87
24.	QA frameworks	28	B78
25.	Quality of service	28	B65
26.	Responsiveness	28	B59
27.	Listening to users	28	B56
28.	Meet targets	29,30,34,31,32,33	B47
29.	Government support		B43
30.	Funding support		B44
31.	Keep control		B81
32.	User satisfaction		B60
33.	'excellence' rating		B77
34.	If unrealistic demoralising		B9
35.	Clarify who is in the partnership	41	B31
36.	Communication between team	41	B21
37.	Consultation with local agencies	41	B35
38.	Working conditions	41	B34
39.	Rewards (PRP)	41	B17
40.	Clarify roles	41	B10
41.	Partnership working	42,43,44,45	B82
42.	Meet government objectives	46	B53
43.	Improves the quality of people with LDs		B76
44.	Integrated service provision		B50
45.	'one stop shop'		B65
46.	Targets		B47

RDS 2

1.	Meeting targets	5	B47
2.	National training strategy	7	B53
3.	Staff commitment	7	B3
4.	Types of training offered	7	B15
5.	Resources	7	B49
6.	Government support	5	B43
7.	Training	8,9,10,11,12	B14

8.	Qualified staff	13,9	B13
9.	Quality of service		B65
10.	Development of staff - knowledge		B6
11.	Staff motivation	9	B7
12.	Government requirement		B53
13.	Reassurance for users		B58
14.	Involvement of LD	19	B56
15.	Systems to allow	19	B72
16.	Willingness of team	19	B7
17.	Changing processes	19	B74
18.	Authority structure	17	B85
19.	Communication	20,21,22	B21
20.	Coordination of team members	23	B1
21.	Record keeping	23	B72
22.	Increased information		B83
23.	Integrated services	24	B50
24.	service quality		B65

Learning Disabilities Team Manager 2 (SC) 2nd Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Information availability	4	B90
2.	Motivation of team	7	B7
3.	Monitoring complaints	8	B80
4.	Understanding of team	8	B55
5.	Information of differing services	8	B83
6.	Involving LD and carers	8	B56
7.	Different ways of working	8	B37
8.	Person centred	9,10,11	B71
9.	Individualised service	12	B70
10.	More responsive to needs	14	B59
11.	Improved planning of services		B65
12.	Greater satisfaction	13	B60
13.	Quality of life		B76
14.	Understand cultural differences		B18
15.	Government support	18	B43
16.	Consultation with LD	19	B56
17.	Resources	21	B49
18.	Requires local control	23	B81
19.	Agreed performance indicators	23	B42
20.	Integrated services	23	B50
21.	Skilled staff	23	B4

22.	Training	21	B14
23.	Targets	25,26	B47
24.	Team processes		B1
25.	Meet government requirements	24,27,28	B53
26.	Providing a top service to users	29	B65
27.	Funding		B44
28.	Jobs		B26
29.	Meet their needs		B61
30.	Understanding disciplines	33	B19
31.	Understanding abilities	36	B4
32.	Consultation with team	33	B2
33.	Fair allocation	36	B91
34.	Understanding jobs	36	B10
35.	Government support	36	B43
36.	Resources	37,38,39,40	B49
37.	Provide quality services	41	B65
38.	Recruit qualified staff		B26
39.	Develop staff	42,43	B14
40.	Meet targets	36	B47
41.	Satisfaction		B60
42.	Staff abilities	41	B4
43.	More qualified staff		B13

RDS 2

1.	Consultation with users	6	B56
2.	Consultation with team	6,7	B2
3.	Individual circumstances	7	B36
4.	National frameworks	5	B53
5.	Training agenda	9	B15
6.	Understanding training requirements	9	B15
7.	Motivation of team	9	B7
8.	Rewards	7	B17
9.	Training	10,11,12,13,14,15	B14
10.	Minority groups		B18
11.	Individualised service		B70
12.	Service quality	16	B65
13.	Innovation	17,18,19	B75
14.	Qualified team		B13
15.	Teamworking	20	B1
16.	Meet requirements of LD		B57
17.	New services		B66
18.	New processes		B74
19.	New systems		B72
20.	Better integration		B82
21.	Regular communication	23	B21

22.	Selection of team members	23	B26
23.	Supportive team	24,26,27	B5
24.	Communicate with each other	28	B21
25.	Quality of life		B76
26.	Understand where to recommend user	29	B88
27.	Motivation		B7
28.	Cohesion of services	29	B62
29.	Service for users improved	30,25	B65
30.	Meet government targets		B47

Learning Disabilities Team Manager 3 (CN) 1st Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Legislation - care standards act	9	B46
2.	Local framework - meeting	9	B53
3.	Partnership collaboration	2	B82
4.	Funding	9	B44
5.	Skill of team	9	B4
6.	Meeting performance objectives - national minimum standards	9	B42
7.	Cooperation in setting objectives with team	2,6	B2
8.	Involvement of users	2,9	B56
9.	Targets	10,11,12,13,14	B47
10.	Positive outcomes for users	15,16,17	B76
11.	Government requirement	18	B53
12.	Public expectation		B54
13.	Effects funding	19	B44
14.	Quality service		B65
15.	Inclusion		B76
16.	Independence		B76
17.	Choice		B76
18.	Enforced change		B84
19.	Resources		B49
20.	Less government control	22	B81
21.	Training	23	B14
22.	'red tape' barriers	26	B86
23.	Understanding of service quality	26	B65
24.	Motivation of team	26	B7
25.	Communication of how?	26	B21
26.	Ability to change	27,28,29	B84
27.	Restructuring service process	30,31	B74
28.	Meet government guidelines		B53
29.	More flexible in dealing with	30	B88

	users		
30.	Quality		B65
31.	User focused		B71
32.	Qualifications	43,39	B20
33.	Training	39	B14
34.	Consultation with staff	40	B2
35.	Consultation with users	40	B56
36.	Involvement of users	43	B56
37.	Communication between staff	43	B21
38.	Pay	43	B17
39.	Abilities of staff	43	B4
40.	Better measurement targets	43	B47
41.	Complaints response	43	B80
42.	Integrated information	43	B83
43.	Quality of service	44,45	B65
44.	Users get the best service		B76
45.	Meet QA targets	46	B47
46.	Funding		B44

RDS 2

1.	Analysing roles	4	B10
2.	Meeting performance targets	4,3	B47
3.	Government funding	4	B44
4.	Resources	5,6,7,8	B49
5.	Needed to improve service		B88
6.	Communication flow	9	B83
7.	Top rate staff		B4
8.	Improve working standards		B65
9.	Knowledge about users		B55
10.	Communication	17,15	B21
11.	Discipline requirements	15	B29
12.	Implementation support team	17	B2
13.	Partnership boards	17	B45
14.	Teamworking	17	B14
15.	Knowledge	17	B6
16.	Advocates (user)	15	B56
17.	Interdependence	18,19,20,21,22	B82
18.	Job losses?		B38
19.	Integrated service delivery	23,24	B50
20.	Clarity of promotion unclear		B39
21.	Values peoples input		B12
22.	Savings (costs)		B73
23.	Improved user outcomes		B76
24.	Better response times		B59

Learning Disabilities Team Manager 3 (CN) 2nd Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Monitoring performance	7	B40
2.	Working together	7	B1
3.	Legislation	7	B46
4.	Local frameworks	7	B53
5.	Workforce abilities	7	B4
6.	Training	5	B14
7.	Targets	8,9,10,11	B47
8.	Lowers morale if not met	12	B9
9.	Meeting service requirements	13	B42
10.	Funding		B44
11.	Working methods		B37
12.	Staff move on		B38
13.	'excellent' rating	14	B77
14.	Satisfaction of LD and carers	15	B60
15.	Encourage other LD to seek help		B76
16.	Training	19	B14
17.	Communication	20	B21
18.	Regular activities	20	B1
19.	Understanding what each other does	20	B19
20.	Coordination between disciplines	23	B82
21.	Legislation	23	B46
22.	Meet QA targets	23	B47
23.	Quality	24,25,26	B65
24.	Meet the needs of the LD		B61
25.	Meet government targets		B47
26.	Recognition of a good job		B25
27.	Agreed targets	28	B42
28.	Fair contribution	31	B91
29.	Communication	31	B21
30.	Personalities that mix	31	B11
31.	Partnership	32,33	B82
32.	Monitor contributions	34	B40
33.	Work together more effectively	35	B1
34.	Know who is responsible		B8
35.	Better understand peoples needs		B55
36.	Support of managers	43	B28
37.	Resources	43	B49
38.	Awards framework	43	B20
39.	Recruiting qualified team members	43	B26

40.	Training	43	B14
41.	Working conditions	43	B34
42.	Pay	43	B17
43.	Skilled staff	44,45,46,47	B4
44.	Requirements of different cultures recognised		B18
45.	Efficient processes		B74
46.	Better relationship with users	48	B76
47.	Meet targets		B47
48.	Individualised support		B70

RDS 2

1.	Involvement of managers	4	B41
2.	Reports	5	B83
3.	Teamwork	5	B1
4.	Work with users	8,5	B56
5.	Understand users	8	B55
6.	Skilled staff	8,5	B4
7.	Training	6	B14
8.	Individualised support	9,10	B70
9.	Better meet needs	12	B61
10.	More responsive		B59
11.	Doing what we can		B42
12.	Satisfied users	11	B60

15.2.1 Learning Disabilities Service Standard Terms

B1	Team working	B47	Targets
B2	Team involvement	B48	Public confidence
B3	Team commitment	B49	Resources
B4	Team skills	B50	Integrated services
B5	Team attitudes	B51	National support
B6	Team knowledge	B52	Local support
B7	Team motivation	B53	Government requirement
B8	Team accountability	B54	Public expectation
B9	Team morale	B55	User knowledge
B10	Team roles	B56	User involvement
B11	Team personalities	B57	User requirements
B12	Team contributions	B58	User reassurance
B13	Qualified staff	B59	User responsiveness
B14	Training and development	B60	User satisfaction
B15	Training provision	B61	User needs
B16	Individual accountability	B62	Service consistency
B17	Rewards	B63	Service provision
B18	Cultural awareness	B64	Service objectives
B19	Inter - Discipline understanding	B65	Service quality

B20	Qualifications	B66	Service development
B21	Communication	B67	Best value
B22	Professional identity	B68	Responsibility for LD
B23	Valuing people	B69	Confidence in service
B24	Individuals needs	B70	Individualised service
B25	Recognition	B71	Patient led
B26	Recruitment	B72	Systems
B27	Status	B73	Cost savings
B28	Management support	B74	Processes
B29	Discipline involvement	B75	Innovation
B30	Discipline commitment	B76	Favourable LD outcomes
B31	Clear responsibilities	B77	Excellent status
B32	Family friendly policies	B78	QA frameworks
B33	Work/life balance	B79	Promoting awareness
B34	Working conditions	B80	Complaints information
B35	Local agency consultation	B81	Control
B36	Individual circumstances	B82	Partnership working
B37	Working methods	B83	Information flow
B38	Staff loss	B84	Organisational change
B39	Promotion	B85	Restructuring
B40	Monitoring performance	B86	Bureaucracy
B41	Management involvement	B87	Political agenda
B42	Performance objectives	B88	Service efficiency
B43	Government support	B89	Consultation
B44	Funding	B90	Information access
B45	Partnership boards	B91	Resource allocation
B46	Legislation		

15.3 APPENDIX C: CASE STUDY B - MANUFACTURING COMPANY
PRODUCTION DEPARTMENT RAW DATA SHEETS

Managing Director 1st Interview
Anchor themes highlighted in bold

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Working with engineering	9	E72
2.	Design and development	9	E32
3.	Constantly update skill requirements	7	E17
4.	Building close relationships (with customers)	9	E5
5.	Closely monitor QA procedures and protocols	6	E61
6.	Retain quality standards	9	E73
7.	Skilled workforce	6,9	E21
8.	Customer IS	9	E12
9.	Meeting customer requirements	10,11,12,13,18,19	E9
10.	Lose customer base		E10
11.	Loyalty from customers	14,16	E11
12.	Continued survival of EMP		E53
13.	Focus on core business	15	E48
14.	Off-set price differentials		E5
15.	Improve attractiveness of company		E74
16.	Compete with LCEs	17	E43
17.	Profitability		E50
18.	Customised products	14,16,17	E35
19.	Costs (decrease)	16	E52
20.	Commitment of operatives to development	22	E23
21.	Raw material sourcing	25	E70
22.	Flexibility of workforce (tasks)	25	E18
23.	Focus on production efficiencies	25	E60
24.	Communication with operatives	23	E40
25.	Price competitive	26,27,28,29	E44
26.	Increase profit margins	30	E49
27.	Retain core customers	31	E2
28.	Crucial for high volume business		E48
29.	Customers will go elsewhere	32	E10
30.	Investment in future of EMP		E42
31.	Survival of business		E53

32.	Business will not survive		E53
33.	Retaining key workers	35	E26
34.	Developing relationships with customers in non-traditional markets	37	E5
35.	Experience of workforce	37	E13
36.	Design and development focus	37	E32
37.	Developing new products	38,39,40	E33
38.	Remain dependent on a few customers	41	E1
39.	Reduce reliance on narrow customer base	42	E1
40.	Meet customer requirements (rapid innovation)	43	E9
41.	Pressure business for lower costs		E4
42.	Reduce pressure (price)		E4
43.	Retain core customers		E2

RDS 2

1.	Retaining skilled workers	5	E26
2.	Recruiting key skills	5	E28
3.	Commitment of workforce	4	E23
4.	Training and development of existing (workforce)	5	E17
5.	Abilities of workforce	6,7,8,9	E21
6.	Product development	10	E32
7.	Cost reductions	11	E52
8.	Production improvements	7	E60
9.	Cannot pursue intended strategies	12	E47
10.	New opportunities (markets)		E45
11.	Retain cost-leadership focus		E44
12.	Business won't survive		E53
13.	Culture change (from narrow job focus)	17	E62
14.	Training	17	E17
15.	Communicating importance (of flexibility to workforce)	16	E40
16.	Willingness (of workforce)	17	E23
17.	Flexibility (functional)	18,19,20,21,22	E18
18.	Dependent on key workers		E29
19.	More efficient production	23	E60
20.	Job satisfaction	24	E27
21.	Better use of abilities	25	E19
22.	Inefficient to have job specialisation		E57
23.	Cost reductions		E52
24.	Motivated workforce		E22

25.	Efficiency improvements (production)		E60
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Managing Director 2nd Interview

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Relationship management software	4	E12
2.	Change to innovative culture	8	E62
3.	Product development process	8	E32
4.	Close relationships with core customers	8	E5
5.	CAD CAM AND 3D mechanical machinery	8	E55
6.	Experienced workforce with product knowledge	8	E13
7.	Commitment to training and development	6	E23
8.	Product diversification	9,15,10,11,12,14	E33
9.	Lose jobs		E24
10.	New product ranges in niche markets	16	E75
11.	Reduce reliance on narrow customer base	17,18,19	E1
12.	Method of competing with LCEs	13	E43
13.	Remove ourselves from direct competition		E45
14.	Will increasingly rely on narrow customer base	20	E1
15.	Continue to lose money		E50
16.	Retain existing business		E2
17.	New markets		E45
18.	New customers		E3
19.	Reduce pressure on cost downs		E4
20.	At the mercy of customers		E1
21.	Training of workforce	22	E17
22.	Flexibility of workforce	26	E18
23.	Preventative maintenance	26	E56
24.	Cell-based manufacturing	26	E60
25.	Continually looking for process improvements	26	E66
26.	Reduce costs	30,27,28,29,31	E52
27.	Return to profitability		E50
28.	Meet customer cost leadership strategies		E9

29.	Compete with LCEs	35	E43
30.	Become too expensive for customers	32	E34
31.	Retain high-volume core product	35	E48
32.	Customers switch supplier	34	E10
33.	Lose market share	34	E46
34.	Continue to lose money		E50
35.	Retain existing customers		E2
36.	Change organisational processes	40	E58
37.	Understanding of workforce	40	E23
38.	Listening to ideas	45	E37
39.	Recruitment and selection	44	E28
40.	Change to an open culture	45	E62
41.	Close relationships with customers	45	E5
42.	Communication between departments	45	E38
43.	Training of workforce	44	E17
44.	Abilities of the workforce	45	E21
45.	Innovation of products and processes	46,47,48,50	E41
46.	Reduce final costs	49,51	E52
47.	New markets	52,53	E45
48.	Meet changing customer demands	54	E9
49.	Meet customer cost downs		E4
50.	Have not been able to compete on price	55	E44
51.	Compete with LCEs		E43
52.	Reduce dependence on existing customers		E1
53.	Increase sales		E51
54.	Retain customers		E2
55.	Decrease profitability		E50
56.	Commitment from directors	57,58	E65
57.	Commitment of workforce	60	E23
58.	Reward ideas	60	E30
59.	Organisational communication	60	E39
60.	Continuous improvement	61,62,63,64	E66
61.	Remain stuck in old ways of working	65	E59
62.	Production process improvements	66	E60
63.	New products	67,68	E33

64.	Motivation of staff		E22
65.	Not competitive		E77
66.	Cost reductions		E52
67.	New markets		E45
68.	Reduce reliance on existing customers		E1
69.	Improve appraisal system	71	E31
70.	Careful recruitment and selection	74	E28
71.	Recognising current capabilities	74	E16
72.	Communication of need to workers	73	E40
73.	Commitment to training requirements	74	E23
74.	Skilled workforce	75,76,77	E21
75.	Abilities become obsolete	78	E21
76.	Meet need for new products	80,81	E33
77.	Recognise process improvements	83	E60
78.	Decrease in profitability	79	E50
79.	Long term survival of EMP compromised		E53
80.	Reduce current narrow customer reliance		E1
81.	New markets		E45
82.	Meet customer requirements		E9
83.	Cost reductions	82	E52

Operations Director 1st Interview

	<i>NLU</i>	<i>Effect</i>	<i>ATAG</i>
1.	Excellent customer service	12,11	E6
2.	GDHA 40% of turnover	7,4	E1
3.	Limited customer base (GDHA)	4	E1
4.	Customer needs are changing	5	E9
5.	Must be more responsive to change	12	E67
6.	Outsource if necessary		E76
7.	Expanding into new products	12	E7
8.	Must keep focussed on improvements	12	E66
9.	Research and development	12,4	E32
10.	100 different variations of	12,16	E75

	products		
11.	Customers particular designs gives them differentiation	12	E7
12.	Pro-active with customers	19,14,15,16,18	E9
13.	Customer retention		E2
14.	Lowering costs	6,13,24,20	E52
15.	Quality products	17,21,18	E73
16.	Customer required specifications	20,22,	E9
17.	Quality assurance standard environmental standard 14001-2001		E73
18.	Customer retention		E2
19.	Enable customer differentiation	24	E7
20.	Stay competitive globally		E53
21.	Gained GCS Yardley (Quality standard)		E73
22.	Compete with imports	25	E43
23.	New business for future		E45
24.	Return to profitability		E50
25.	Beat foreign competition	24	E43
26.	Source global products	29	E68
27.	Must reduce costs to retain customer share	31	E52
28.	Eastern Europe and far east (price of manufacturing)	31	E43
29.	Price pressure from customers (GDHA, Indesit)	31	E4
30.	Manufacturing design changes by customers	31	E9
31.	Flexibility (employee)	36,32,33,34	E18
32.	Take cost out of manufacturing products	36	E52
33.	Greater range of products for customers	37,38,39,40	E75
34.	Constant product innovation	37,39,35	E32
35.	EMP needs to diversify		E33
36.	Reduce operating costs	37	E52
37.	Profitability		E50
38.	Improves customer differentiation	41	E7
39.	Allows customers to develop new products	41	E7
40.	Supply GDHA (major customer that's expanding - successful)		E2
41.	Customer retention		E2

42.	Reliance on too few customers	43	E1
43.	Demand change (products/price)	44	E4
44.	Caused by customer requirements	48	E9
45.	Investment in CNC machinery	48	E55
46.	Experienced workforce	48	E13
47.	In-house and external training	48	E17
48.	Design and development	49,50,51,52,53,54	E32
49.	Stay ahead of competition		E77
50.	New products	55,58	E33
51.	Keep costs down for customers	56,57	E52
52.	Ease manufacturing for ourselves (process)		E60
53.	Reduces price of products	56	E34
54.	Reduce production costs		E52
55.	Differentiate from competitors	60	E77
56.	Retain customer share	60	E2
57.	Compete with global competitors		E77
58.	Pro-active with customers	55,59	E9
59.	Customers can differentiate	61	E7
60.	Profitability		E50
61.	Sole supplier to offer product		E77
62.	Needs involvement/communication	63	E37
63.	Retain key skill workers	65	E26
64.	Training in-house/external	65	E17
65.	Experienced workforce	66,67,68,69	E13
66.	Product knowledge		E32
67.	Best practice (all areas)		E77
68.	Allows for manufacturing methods improvements	71	E60
69.	New products	73,70	E33
70.	Allows customers to have an original product	74	E7
71.	Reducing ops costs	72	E52
72.	Price competitiveness for customers		E34
73.	Differentiates us from competitors	74	E77
74.	Retain customer share	75	E2
75.	Profitability		E50

76.	Research and development	80	E32
77.	Employee flexibility	80	E18
78.	Experienced workforce	77,80	E13
79.	Training	76,78	E17
80.	Quality products	81,82,83,84,85	E73
81.	Customers want lowest costs, but will not tolerate lower quality	83	E9
82.	Already gained ISO 14001-2004 ISO 9001-2000 (Quality standards)	83	E61
83.	Customer retention		E2
84.	May overcome price inequalities		E5
85.	Has produced preferred supplier status		E77

Operations Director 2nd Interview

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Knowledgeable workforce - well trained (skilled)	5	E21
2.	Techniques to improve manufacturing efficiency (cell production)	4,6	E60
3.	Too much reliance on a few suppliers - GDHA, Indesit	9	E1
4.	Manufacturing techniques focussed on innovation	9	E41
5.	Experienced workforce - experience of product development	9	E13
6.	Manufacturing processes changed - no scope for cost improvements	9	E59
7.	Traditional domestic appliance manufacture business in decline	9	E8
8.	Lower cost exporters	7	E43
9.	Differentiation (products)	10,11,12,20,14, 15,16,17	E33
10.	At mercy of LCEs		E43
11.	Remain reliant on current customers		E1
12.	Increase customer base	18,19	E3
13.	Had success in new furniture business	9,22	E45

14.	Decrease reliance on existing customers	21	E1
15.	Expand into Europe	22	E45
16.	China (expansion)		E45
17.	Take advantage of tastes (changing) - wire design	22	E45
18.	Decrease reliance on GDHA, Indesit (customers)		E1
19.	Profitability		E50
20.	In niche markets - meets customer requirements	23	E9
21.	Can increase profit margins - relax price pressure	19	E49
22.	Opens new market opportunities		E51
23.	Retain core customers		E2
24.	Must recognise and meet expectations (customers)	33	E9
25.	Powerful influence on business	24	E80
26.	Dedicated relationship managers - don't currently have	30	E28
27.	Global reach for suppliers	25	E68
28.	Customer design functions (work closely with)	30,33	E5
29.	Main customers are long-serving - recognise requirements	30,33	E5
30.	Close working relationships (customers)	33	E5
31.	Technology (CIS)	33,30	E12
32.	Research and development	33	E32
33.	Pro-active with customers	38,34,35,36,37	E5
34.	Be attractive to existing customers - global reach	39	E74
35.	Meet their requirements - continuously changing design requirements	40	E9
36.	Meet their price and quality targets	39	E9
37.	Meet customer demands for cost-downs	39	E4
38.	Customers will switch suppliers		E10
39.	Retain customers		E2
40.	Allows customer product differentiation		E7
41.	Continuous improvements	49,43	E66
42.	Skilled workforce	43	E21

43.	Efficient manufacturing processes	49	E60
44.	Competition from LCEs	49	E43
45.	Quality a given - quality but cheap	49	E73
46.	Can source globally	49	E68
47.	GDHA, Indesit, RL >85% of sales	46,48	E1
48.	Price pressure (customers)	49	E4
49.	Cost leadership (in relation to core business)	50,51	E44
50.	Retain core business customers	52,53	E2
51.	Can compete with LCEs	52,53	E43
52.	Remain profitable		E50
53.	Retain workforce		E26
54.	Industry in decline	55,56,59	E8
55.	Improve efficiencies of processes	60	E60
56.	Need new products	60	E33
57.	Change culture 'historically profitable'	60	E62
58.	Training of workforce	57,60	E17
59.	Encourage employees to look for improvements (products and processes)	60	E59
60.	Continuous improvement (of all aspects of dept.)	61,68,62,63,66	E66
61.	New designs - exceed customer expectations	65,63	E33
62.	Efficient manufacturing processes	69	E60
63.	New products	70,71,72	E33
64.	Profitability		E50
65.	Customer requirements (customisation)	67	E35
66.	New products in niche markets	67	E75
67.	Retain customers	72	E2
68.	Inhibits being set into old ways of doing things		E59
69.	Cost reductions	67	E52
70.	Move into other u.k. markets		E45
71.	Diversify into Europe		E45
72.	Profitability		E50
73.	Involvement (e.g. listening to ideas)	74	E37
74.	Retaining key skilled workers	76	E26
75.	Training and development	76	E17
76.	Experienced workforce	78,79	E13
77.	Requires fewer operatives		E24

78.	Capable of producing new products	77,82	E21
79.	Recognising improvements	83	E60
80.	Growth of EMP (size)		E54
81.	Decrease reliance on customers		E1
82.	Diversify into other markets	81,84	E45
83.	Reduce costs		E52
84.	Expansion across u.k. and europe	80	E45

Production Manager 1 1st Interview

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Managerial support	2,4	E65
2.	Training (requires investment)	5	E17
3.	Recruitment of staff (difficult)	5	E28
4.	Listen to shopfloor	7	E37
5.	Skilled workforce	7	E21
6.	Cell production methods	7	E59
7.	Efficient production	8,9,10	E60
8.	Meet targets set by firm	12,13	E61
9.	keep costs down	14,15	E52
10.	Value for money	11	E34
11.	Retain customers		E2
12.	Keep jobs		E26
13.	Remain competitive		E53
14.	Important for competing with LCEs		E43
15.	Retain workforce (been redundancies)	16	E26
16.	Keep skills required	7	E21
17.	Training (skills)	21	E17
18.	Recruitment (key)	21	E28
19.	Design of production operations	25	E59
20.	Supply chain unreliable	25	E70
21.	Experienced workforce	25	E13
22.	Investment in machinery (CAD CAM - 3D Mechanical)	25	E55
23.	Price of raw materials	24	E69
24.	Require high quality materials	25	E70
25.	Product quality	26,27,28	E73
26.	Allows differentiation from imports	29,30	E77
27.	Customer expectation	31,32	E9

28.	Retention of key people	21	E26
29.	Compete with lower costs of eastern Europe and far east manufacturers		E43
30.	Profitability		E50
31.	Requirement for (firm) survival		E53
32.	Quality but not at extra cost (customer requirement)		E2
33.	Losing money (must invest or die)	36	E42
34.	Managerial support (management focussed on cost cutting)	36	E65
35.	Management review (need new blood)	34	E63
36.	Investment in new machinery	37,38,39	E55
37.	Faster production (reduced lead time to market)	40	E78
38.	Required to improve quality	42	E73
39.	Changing customer requirements means constant new designs required	43	E32
40.	Increased outputs (volume benefits)		E51
41.	Increased company performance	44	E61
42.	Meet customer requirements	41	E9
43.	Meet customer innovation requirements		E9
44.	Profitability		E50
45.	Money (requires...)	50	E42
46.	National shortage (production skills)	50	E21
47.	New CNC machinery	51	E55
48.	Lost personnel (redundancies)	51	E24
49.	Managers block recruitment (expand jobs)	50	E23
50.	Recruitment of skilled workers	53	E28
51.	Training programmes	53	E17
52.	Cell production methods	51	E59
53.	Workforce (skills and experience)	54,55,56	E13
54.	New ideas for design of products	57,58	E32

55.	Complex customised products	59	E35
56.	Ideas to improve production efficiency	60	E60
57.	Keep ahead of competitors (difficult competition in high volume)		E77
58.	Meet customer requirements	59	E9
59.	Customer satisfaction		E79
60.	Reduce costs		E52
61.	Training	63	E17
62.	Recruitment	63	E28
63.	Skilled people	66	E21
64.	Investment in new machinery	65,66	E55
65.	Engineering department (equipment function)	66	E72
66.	Customisation (specialist components/products)	67,68,69	E35
67.	Compete with lower cost competitors		E43
68.	Meet customer requirements	70	E9
69.	Develop into new areas		E45
70.	Retain their business (customers)		E2

Production Manager 1 2nd Interview

	<i>NLU</i>	<i>Effect</i>	<i>ATAG</i>
1.	Engineering input	2	E72
2.	Product design improvements	5	E32
3.	Experience of workforce	2,5	E13
4.	Training	3	E17
5.	Quality (products)	6,7,8,9	E73
6.	Gain new customers	10	E3
7.	Customer retention (most important factor)	11	E2
8.	Beat competitors (renowned for low quality)	12	E77
9.	Lose customers	13	E10
10.	Increase customer base		E3
11.	Keep customer share (low cost pressures)		E46
12.	Regain profitability		E50
13.	Go out of business		E53
14.	Efficiency (production)	16	E60
15.	Skill of production team	17	E21
16.	Rapid production processes	19	E60

17.	Innovative designs	19	E41
18.	Quality products	19	E73
19.	Meeting customer requirements	20,21,22	E9
20.	Keep jobs		E26
21.	Remain attractive to customers	23,24	E74
22.	Growth of EMP		E54
23.	Retain customers		E2
24.	Customers increase orders		E51
25.	Commitment to people (management)	26	E65
26.	Workforce skills	28	E21
27.	Investment in state of the art machining equipment	28	E55
28.	New products	29,30	E33
29.	Expansion into new areas	31	E45
30.	Offer alternatives for existing customers	32	E75
31.	Develop business		E54
32.	Increase the order book	33	E51
33.	Increase profits		E50
34.	Profit improvement (requires a...)	36	E50
35.	Investment from management	36	E42
36.	Training (workforce)	37,38,39	E17
37.	Remain employable		E25
38.	Come up with new designs	40,41,42	E32
39.	Motivated team	38	E22
40.	New products (e.g. wireware)	41	E33
41.	New markets		E45
42.	New ways of working		E59
43.	Money (requires...)	45	E42
44.	Management support	45	E65
45.	Investment (CNC machinery)	46,47,48	E55
46.	Lose ground to competitors	50	E77
47.	Allows new product development	51,52	E33
48.	Improves production efficiency	49	E60
49.	Lead times (shorter)		E78
50.	EMP goes out of business		E53
51.	New customers		E3
52.	Greater range for existing customers		E75

Production Manager 2 1st Interview

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Requires investment	4	E42
2.	Must not lose more jobs	5	E24
3.	Managerial support (lacks - lacks direction)	2	E65
4.	Machinery (new)	8	E55
5.	Workforce (experience)	8	E13
6.	Understand customer requirements	8	E9
7.	Keep close to customers	6	E5
8.	Product quality	9,10,11	E73
9.	Retain SGS Yardley -QAs -ES (quality standards)	13	E61
10.	Keep ahead of competitors	14,15	E77
11.	Customers demand quality	16,12	E9
12.	Secure further orders		E51
13.	Future business for company		E54
14.	Remain viable (EMP)		E53
15.	Retain (whats left of) workforce (jobs)		E26
16.	Keep customers		E2
17.	Direction of company wrong (cost cutting)	19	E47
18.	New premises (currently too small)	21	E64
19.	Money (lack of)	18,21	E42
20.	Investment in new machinery	19	E55
21.	Investment (machinery)	22,23,24,25	E55
22.	Retain and improve quality	26,28	E73
23.	New components	28,29,30	E32
24.	Lead times reduced (high volume)	31	E78
25.	Improve production methods	32,33	E60
26.	Customers insist on quality	27	E9
27.	Survival (of company LCEs mentioned)		E53
28.	Beat competitors	27	E77
29.	New markets		E43
30.	New customers (decrease reliance on existing)		E3
31.	Satisfaction of customers		E79
32.	Efficiency improved		E60

33.	Company outcomes (meet...positive)		E54
34.	Investment (money)	35,37	E42
35.	Current workforce (conditions)	38	E20
36.	Recruitment of skilled operatives	37,40	E28
37.	Training	40	E17
38.	Retaining workforce (job losses mentioned)	40	E26
39.	Company refocus (needs to...from costs)	38	E47
40.	Skilled workforce	41,42,43	E21
41.	Production improvements (efficiencies)	45,46	E60
42.	Quality products	47	E73
43.	Design (product) improvements	47,44	E32
44.	Continuous improvement (competitive advantage)		E66
45.	Shorten lead times		E78
46.	Reduce costs		E52
47.	Customer satisfaction		E79
48.	Training	52	E17
49.	Recruitment of skills	52,56	E28
50.	Investment	49,48,53,51	E42
51.	New premises	53	E64
52.	Research and development	56	E32
53.	New machinery	56	E55
54.	Retaining skilled workforce	56	E26
55.	Managerial commitment	54	E65
56.	Product range	57,58,59	E75
57.	Customer requirements constantly changing (meet this)		E9
58.	Move into new markets	60	E45
59.	Differentiate from competitors		E77
60.	Increase customer base		E3
61.	Communication (management to shopfloor and vice versa)	62	E39
62.	Ideas from shopfloor	64	E37
63.	New management team	64	E63
64.	Management focus (change from cost cutting to quality, investment, new products)	65,66	E47
65.	Compete with low cost	68	E43

	manufacturers (can't compete with them on price in U.K.)		
66.	Retain jobs (skilled workforce)	69,70,67	E26
67.	New products		E33
68.	Differentiate from competitors	71	E77
69.	Process improvements		E59
70.	Quality		E73
71.	Success (of company)		E54

Production Manager 2 2nd Interview

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Suggestion schemes	4	E37
2.	Involvement (managerial meetings)	4	E39
3.	Training in new CNC machinery	8	E17
4.	Listen to shopfloor workers	8	E37
5.	New suppliers	8	E70
6.	Production equipment improvement	8	E55
7.	Investment	6	E42
8.	New products	9,10,11	E33
9.	Better range for customers	12,13	E75
10.	New markets (success of furniture)	13,14,15	E45
11.	Company is more attractive to more people	15	E74
12.	Required to keep current customers (e.g.GDHA)		E2
13.	More customers		E3
14.	Compete with developing countries (competitors)		E77
15.	Profitability		E50
16.	Commitment to training	18	E17
17.	Ideas from workforce	19	E37
18.	Increase skills	21	E21
19.	Improve cell methods	21	E59
20.	Training (improvements)	19	E17
21.	Manufacturing efficiency	22,23	E60
22.	Reduce lead times	25,26	E78
23.	Reduce re-work	26,24	E60
24.	Increase man-hours		E19
25.	More responsive to changing customer requirements		E9

26.	Cost savings		E52
27.	High quality	30	E73
28.	Skills of shopfloor	30,27	E21
29.	Close relationships with customers	30	E5
30.	Meet customer requirements (constantly change)	31,32,33	E9
31.	Keep our customers (requirements constantly change)	34	E2
32.	Possibility of larger orders		E51
33.	New orders		E3
34.	Money for investment		E42
35.	Ideas from production operatives	37	E37
36.	Follow quality standard procedures	38	E59
37.	Continuously improve (production and products)	38	E66
38.	Quality (product)	39,40	E73
39.	Keep our current business	41	E2
40.	Our quality exceeds cheaper imports		E77
41.	Stay afloat (survival)		E53
42.	Dedicated people (to this task)	43	E28
43.	Communication with customers	44,45,46	E5
44.	Know customer specifications (products)	47	E9
45.	Be aware of quality problems	47,48	E73
46.	Understand more about future requirements		E9
47.	Meet customer needs		E9
48.	Improve products		E32

Production Manager 3 1st Interview

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Quality department	3	E71
2.	Retention of workers	4	E26
3.	Meeting quality standard procedures	7	E61
4.	Workforce experience	3,7	E13
5.	Supply chain efficiencies	6	E80
6.	Raw material transportation	7	E70

	time		
7.	Quality (product)	8,9,10,12	E73
8.	Main reason customers choose us over competitors		E77
9.	Requirement for customers (GDHA, Indesit)	11	E9
10.	Retain market share		E46
11.	Retain customer base		E2
12.	Increase customer base (new customers)		E3
13.	Key people retained	16,18	E26
14.	Relationship with customers	19	E5
15.	Design and development	19	E32
16.	Engineering expertise	19	E72
17.	Production expertise	19	E13
18.	Abilities and knowledge (of workers)	17	E21
19.	Product range	20,21	E75
20.	Meet customer requirements (changing tastes)	22	E9
21.	Offer products competitors don't	23	E33
22.	Keep customers		E2
23.	Competitive advantage		E77
24.	Development opportunities	28	E17
25.	Money (wages)	28	E42
26.	Training	30	E17
27.	Company support	28	E65
28.	Retain skilled people	30	E26
29.	Improve working conditions (site poorly suited to manufacturing)	28	E20
30.	Workforce (skilled)	31,32,33	E21
31.	Design improvements	34,32,33	E32
32.	Increase product range	36	E75
33.	Increase product quality	37	E73
34.	Production efficiencies	35	E60
35.	Reduce costs		E52
36.	Meet customer needs		E9
37.	Stand out from competitors		E77
38.	Greater involvement in senior management communications	41	E81
39.	Cross functional meetings	41	E38
40.	Suggestion schemes	41	E37
41.	Communication (with other functional areas and above)	42,43,44,45	E39
42.	Better quality		E73

43.	Know what each area is doing	46,47,48	E71
44.	Improve trust (management)		E15
45.	Workforce involvement	48	E81
46.	Customer needs can be met		E9
47.	Design improvements		E32
48.	Motivation (now: us and them - redundancies imposed)		E22
49.	Quality	52	E73
50.	Products customers want	52	E9
51.	Efficient production	52	E60
52.	Profitable company	54	E50
53.	Innovative designs	52	E41
54.	Investment (machinery)	55,56	E55
55.	Improve product specs (quality)	59	E73
56.	Needed for customer requirements	58,59,57	E9
57.	New customers		E3
58.	New markets		E45
59.	Keep existing customers		E2

Production Manager 3 2nd Interview

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Investment	4	E42
2.	Support (management)	5	E65
3.	Communication (ideas listened to)	5	E37
4.	New people (new skills)	7	E28
5.	Workforce (existing)	7	E21
6.	New technology	7	E55
7.	Innovation (product)	8,9	E41
8.	New products	10,11,12	E33
9.	Better ways of working (processes)		E59
10.	Diversify (enter new markets)		E45
11.	Expand customers (customer base)		E3
12.	Meet customer expectations		E9
13.	Training for QA requirements	15	E17
14.	Retain key skills	16	E26
15.	Careful watch on standards	19	E61
16.	Existing knowledge	19	E13
17.	Better control of suppliers	19	E80

18.	Money (materials and machinery requirements)	19,14	E42
19.	Quality (product)	20,22	E73
20.	Customers demand quality	21	E9
21.	Keep customers happy	23	E79
22.	Makes us different from competitors	23	E77
23.	Retain jobs	14	E26
24.	Don't recognise achievements (e.g. QA standards)	27	E16
25.	Listen to workforce	27	E37
26.	Need new management people	27	E63
27.	Top-level support	28,29,30	E65
28.	Understand what is required		E19
29.	Investment in new machinery	31,32	E55
30.	Motivated workforce	33	E22
31.	Retain quality		E73
32.	New products		E33
33.	Actively look for improvements (processes and products)		E66
34.	Management (cutting costs focus)	35	E65
35.	Investment (machinery)	40,36,37,38	E55
36.	Process improvements		E60
37.	Faster lead times	42,43	E78
38.	Needed for product amendments (customer constantly changing requirements)	39	E9
39.	Keep customers		E2
40.	Workforce commitment (investment in working cons/wages etc.)	41	E23
41.	Improvements (processes and products)		E66
42.	More responsive to customer needs		E9
43.	Cost savings (cost of prod. Time)		E52
44.	Recognise rare skills	45,46,47	E16
45.	Improve wages	49	E82
46.	Improve working conditions	49	E20
47.	Managerial support	45,49	E65
48.	Retaining jobs	49	E26
49.	Skilled workforce	50,51,52	E21

50.	More efficient production	53	E60
51.	Quality products	54,55	E73
52.	New products	56	E33
53.	Cost savings		E52
54.	Customer requirement (retention)		E2
55.	New customers		E3
56.	New markets		E45

15.3.1 Manufacturing Firm Standard Terms Vocabulary

	<i>Standard Term</i>		<i>Standard Term</i>
E1	Customer dependence	E42	Investment
E2	Customer retention	E43	LCE competition
E3	New customers	E44	Cost leadership
E4	Customer pressure	E45	New markets
E5	Customer relationships	E46	Market share
E6	Customer service	E47	Company strategies
E7	Customer product differentiation	E48	Core business
E8	Manufacturing decline	E49	Profit margins
E9	Customer requirements	E50	Profitability
E10	Customer loss	E51	Sales
E11	Customer loyalty	E52	Cost reductions
E12	Customer IS	E53	Company survival
E13	Experienced workforce	E54	Growth of company
E14	Job performance	E55	New production machinery
E15	Trust	E56	Machinery maintenance
E16	Employee Recognition	E57	Job specialisation
E17	Workforce training and development	E58	Organisational processes
E18	Workforce general flexibility	E59	Production working methods
E19	Workforce efficiency	E60	Production efficiency
E20	Working conditions	E61	Performance targets
E21	Workforce abilities	E62	Culture change
E22	Workforce motivation	E63	Managerial restructuring
E23	Workforce commitment	E64	Company premises
E24	Workforce reduction	E65	Managerial commitment
E25	Employability	E66	Continuous improvement
E26	Worker retention	E67	Responsive to change
E27	Job satisfaction	E68	Global sourcing
E28	Recruitment and selection	E69	Supplier pressure
E29	Skilled employee dependence	E70	Raw material sourcing
E30	Rewards	E71	Functional coordination
E31	Appraisal system	E72	Engineering partnership
E32	Product development	E73	Product quality
E33	Product diversification	E74	Company image
E34	Product price	E75	Product range

E35	Customised products	E76	Outsource
E36	Horizontal communication	E77	Competitive advantage
E37	Upwards communication	E78	Product time to market
E38	Inter - Departmental communication	E79	Customer satisfaction
E39	Organisational communication	E80	Supply chain
E40	Downward communication	E81	Employee involvement
E41	Innovation	E82	Wages

15.4 APPENDIX D: CASE STUDY C - EDUCATION EQUIPMENT SALES
COMPANY RAW DATA SHEETS

Learning Resource Director 1st Interview
Anchor themes highlighted in bold

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Engineering skills	5	A2
2.	Recognising key tenders	6	A9
3.	Proactive in seeking tenders	8	A9
4.	Be aware of margins	8	A15
5.	Developing new products/selling	8	A5
6.	Greater quote/sales conversions	8	A16
7.	Experience of sales staff	6	A34
8.	Increase order book	9,10,11,12	A18
9.	Regain market leadership	13	A21
10.	Increase profits	13	A17
11.	Continued improved sales performance trend	14	A18
12.	Revisit firm processes		A99
13.	Survival of the firm		A20
14.	Confidence regained in firm		A25
15.	Investment	16	A39
16.	Recruit the right people	19	A38
17.	Communicate financial realities	19	A40
18.	Bonus system	19	A37
19.	Proactive (e.g. in seeking tenders)	20,21	A9
20.	Present in all possible tenders	22	A11
21.	Department becomes more dynamic	23	A57
22.	Greater chance of sales	24	A18
23.	Motivated sales team	19	A45
24.	Improve profits	15	A17
25.	Sales/agent communication	27	A59
26.	Experienced sales team	29	A34
27.	Being present in all possible tenders	29	A11
28.	Proactively seeking opportunities	27	A9
29.	Maximise sales opportunities	30,31	A18
30.	Quote/sales ratio	32,33	A16
31.	Greater efficiency (costs/sales)	33	A22

32.	Firm growth		A19
33.	Increase profits	34	A17
34.	Reinvest in firm		A39
35.	Web conferencing facilities	38	A79
36.	Sales working within budgets	40	A31
37.	Less travel	40	A44
38.	Utilising new technology	40	A79
39.	Development of web sales	38	A80
40.	Cost efficiency	41,42	A22
41.	Decrease costs	43	A23
42.	Money freed up for new product development	44	A5
43.	Improve profit margins		A15
44.	Potential for new sales		A18

RDS 2

32.	Looking outside of sales	5	A57
33.	New technology	5	A79
34.	Proactive sales team	5	A9
35.	Personalities	3	A41
36.	Network relationships	7,8,9	A49
37.	Improve quotation accuracy	10	A13
38.	Closer relationships with customers	6,11	A83
39.	Closer relationships with agents	12	A62
40.	Better relationships within the firm	13	A33
41.	Greater quote/sales conversion		A16
42.	Provide the learning solutions they require		A82
43.	Understand local markets	6	A96
44.	Improve efficiencies		A22

Learning Resource Director 2nd Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Listen to commercial and sales arguments	4	A40
2.	Structural changes	6	A46
3.	Inter-departmental cohesion	6	A33
4.	Change of attitude	3,6	A32
5.	Communication from directors	4	A58
6.	Customer focus	7,9,10	A81
7.	Out-perform competitors		A24
8.	Better understand local environments	13	A96

9.	Understand customer demands and needs	8,13,14,15	A82
10.	Caused a new dynamism	11	A57
11.	Motivated sales staff		A45
12.	Win more business		A18
13.	Tailor quotations	12	A13
14.	Get closer to customers		A83
15.	Improve forecasts		A28
16.	Bonus system (just implemented)	25,23	A37
17.	Communication between sales and agents	18	A59
18.	Close relationship with agents	23	A62
19.	Promote a sense of urgency	24	A45
20.	Leadership involvement	19,25,21,22	A65
21.	Market knowledge	25	A29
22.	Offering discounts to win orders	25	A27
23.	Understanding and responding to customer requirements	25	A82
24.	External focus	23	A93
25.	Increase order book	26,27,28,29	A18
26.	Competitive advantage		A24
27.	Return to market leadership		A21
28.	Secure the future of the firm	31	A20
29.	Increased investments in firm possible	32,30	A39
30.	Employee commitment		A47
31.	Ability for long-term planning		A30
32.	Facilitates relationships		A49

RDS 2

1.	Availability of senior management	5	A65
2.	Leadership role models	5	A66
3.	Restructuring	5	A46
4.	Bonus system	8	A37
5.	Culture change	8	A48
6.	Flow of information through departments	8	A33
7.	Departmental communication	6	A57
8.	Market minded	9,10,11,12,14	A29
9.	Better understand customers		A82
10.	Will understand competitor prices	16	A72
11.	Understand competitor products	16	A69
12.	Possible new ways of working	13	A99

13.	New products		A5
14.	Realise costs	15	A23
15.	Realise margins	19	A15
16.	Influence quotations	17	A13
17.	Find price-downs	18	A27
18.	Increase orders		A18
19.	Meet financial objectives		A17
20.	Communicating the commercial realities	23	A40
21.	Investment (e.g. increased travel to see agents)	25	A39
22.	Bonus system	25	A37
23.	Employees 'buying in'	25	A47
24.	Senior management communication	23	A58
25.	Attitudes	26,27,28,29	A32
26.	Motivation of sales force	30	A45
27.	Better coherence between departments	29	A33
28.	Greater flexibility (tasks)		A51
29.	More responsive to customers		A88
30.	Collective culture 'all in this together'		A48
31.	Improving customer-manufacturer relationship	36	A83
32.	Restructuring	36	A46
33.	Changing attitudes from manufacturing base to learning solutions provider	36	A32
34.	Changing traditional compartmentalised focus	36	A57
35.	Involve engineering in sales conferences	36,31	A3
36.	Inter-departmental cohesion	37,39	A33
37.	Flow of information increased	38,41,42	A57
38.	Better understand what the firm can offer		A6
39.	Better customer responsiveness	40	A88
40.	After-sales care improved		A70
41.	Better understand customers		A82
42.	Better understand market		A29

Senior Manager 1 1st Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Gain sales		A18
2.	Head start on competitive tendering process	1	A14
3.	Influence tender specifications	2	A12
4.	Motivation of sales team		A45
5.	Understand export conditions		A55
6.	Maximise sales opportunities		A18
7.	Recruit people with the right personality	9	A38
8.	Sales focuses - generate sales		A52
9.	Personalities	5,10,11,13,14,8,6,5	A41
10.	Better internal relationships	4,16	A33
11.	Obtain results (assertive but firm)	15	A74
12.	Improves relationships with agents	17,18	A62
13.	Improves customer relations	18	A83
14.	Relationships key to sales performance		A49
15.	Gain sales		A18
16.	Increased communication	17	A57
17.	Better coordination	11	A33
18.	Understand tender requirements	19,3	A12
19.	Tighter quotes (focused)	15	A13
20.	Constant communication	25	A85
21.	Information becomes uncoordinated		A57
22.	Regular visits to export countries	25	A44
23.	ERP system	25	A75
24.	Investment	23	A39
25.	Relationships	21,26,27,28,29,35,30	A49
26.	Customers return when relationship is strong	34	A84
27.	Closer links with agents	31	A62
28.	Technology fast moving - keep customers informed	32	A89
29.	Understand direct customer requirements - diverse	33	A82
30.	If poor lose customers		A84
31.	Understand customer requirements		A82
32.	New sales		A18

33.	Meet their needs		A87
34.	Increase sales performance		A18
35.	Improve motivation of team	34	A45
36.	Agreed sales targets	38	A74
37.	Strong leadership	38	A66
38.	Motivated workforce	40,41,43	A45
39.	Recruiting the right people	41,43	A38
40.	Patience	44	A43
41.	Hard work	44	A44
42.	On time delivery	44	A88
43.	Perseverance	44	A47
44.	Reputation	46,47,48,49	A78
45.	Increase sales performance		A18
46.	Important for securing orders		A82
47.	Beat competition - many new competitors		A24
48.	Lose customers		A84
49.	Miss out on new tenders		A11

RDS 2

1.	External focus	3	A93
2.	Traditionally successful	4,5	A17
3.	Market knowledge	6	A29
4.	Longevity - 50yr old	6	A78
5.	Long trading years - 1 st U.K. company	6	A78
6.	History	8,9,10,11	A77
7.	New sales		A18
8.	Word of mouth selling - people know us		A92
9.	Reassurance for customers	12,13	A82
10.	Brand recall		A92
11.	Customers will contact us	14	A83
12.	Price insensitivity (to an extent)		A91
13.	Customer opts for us over competitors		A24
14.	Sales cost savings		A23
15.	Departmental communication	17,18	A57
16.	Proactively working with customers	20	A9
17.	Listening to marketing	21	A1
18.	Listening to engineering	21	A3
19.	High standards	21	A7
20.	Listening to customer satisfaction		A87
21.	Products (e.g. knowledge)		A6
22.	Can give specifications (e.g.	23	A71

	performance)		
23.	Gain new sales (1900+products)		A18
24.	Provide customers more alternatives	26	A6
25.	Meet customer needs		A82
26.	Beat aggressive local competition		A24

Sales Manager 1 2nd Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Faster decision making	9	A94
2.	Improve procedures	1	A99
3.	Allow flexibility on margins	7	A15
4.	Encourage travel to customers	9	A44
5.	Flexibility of engineering (products)	9	A3
6.	Leadership	9,7	A65
7.	Promotion of a sales based culture	9	A48
8.	Communications to all departments	7	A57
9.	Customer focus	11,12	A81
10.	Meet their requirements	15	A82
11.	Understand customer needs	10	A82
12.	Customise quotations	13	A13
13.	Price competitive	14	A14
14.	Beat competition		A24
15.	Customer satisfaction	16,17,18	A87
16.	New customers		A90
17.	Retain our customers		A84
18.	Increase sales	19	A18
19.	Profits		A17
20.	Outward focus		A93
21.	Change attitudes (from reactive)	20	A32
22.	Sales coaching	25	A54
23.	Recruit sales personnel with 'personality fit'	22,25	A38
24.	Investment	23	A39
25.	Personalities	21,26,28,29,30,31	A41
26.	Actively seek business		A9
27.	Remember us when required		A92
28.	Develop strong relationships with customers	27,32,33,34	A83
29.	Better relate to local agents (agent network in 80	36	A62

	countries)		
30.	Influence tenders		A12
31.	Staff morale improved		A53
32.	Recommendations		A86
33.	Customers come back to us	35	A84
34.	Customers buy more	35	A18
35.	Profits		A17
36.	Motivate agents	37	A63
37.	Sales	35	A18

RDS 2

1.	Support of leaders	3	A66
2.	Closer involvement of directors	6	A65
3.	Change processes	6	A99
4.	Inter-departmental coordination	6	A33
5.	Inter-departmental meetings	4	A57
6.	Communication	8,13,9,14,10	A85
7.	Increased sales		A18
8.	Meet customer needs	7,12,9	A82
9.	More efficient product development		A8
10.	Relationships with local agents improved	11	A62
11.	More clearly understand what we can provide		A6
12.	Customer retention	7	A84
13.	Monitor customer preferences over time	8	A83
14.	Improve marketing information	15	A1
15.	Customer understanding of products		A6
16.	Initiative taking	20	A9
17.	Empowerment	20	A56
18.	Changing traditional unwillingness to discount	20	A27
19.	Culture change	18	A48
20.	Price flexibility	22,23,24	A14
21.	Greater quote/sale conversion	25	A16
22.	Price reductions will win orders	21,25	A18
23.	Goodwill to regular customers	26	A87
24.	Overcome competition	27	A24
25.	Profits		A17
26.	Retention		A84
27.	Regain market leadership		A21
28.	Director led	32	A65

29.	Communication	32	A85
30.	Recruit specialist personnel	34	A38
31.	Information systems	34	A76
32.	Changing culture from internal focus	34	A48
33.	Training	32,31	A50
34.	Market knowledge	36,37,38	A29
35.	Gain competitive advantage		A24
36.	Aware of competitor tactics	35,40	A68
37.	Ideas for product development	41,42	A5
38.	Better tuned to local environment	39	A96
39.	Competitive tenders	43	A14
40.	Tighter tenders		A13
41.	New sales/markets		A95
42.	More sales to existing customers		A18
43.	Increased sales		A18

Sales Manager 2 1st Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Experienced sales staff	4,9	A34
2.	Being able to offer discounts	6	A27
3.	Working more closely with agents	6	A62
4.	Ability to influence tender specifications	9	A12
5.	Product knowledge	4,6	A6
6.	Converting quotes/sales	9	A16
7.	Setting agreed targets	9	A74
8.	Better relationship (closer) with senior managers	7	A65
9.	Exceed sales targets	10,11,12	A74
10.	Company improves profitability	13	A17
11.	Sales bonus payments		A37
12.	Renewed faith in sales		A25
13.	Job stability		A42
14.	Investment	15,16	A39
15.	Regular travel	17	A44
16.	Web-based technology	17	A79
17.	Agent contact	18,20	A62
18.	Improve local knowledge	21,19	A96
19.	Recognise price downs	22	A27
20.	Improve knowledge of local competitors		A96

21.	More accurate quotations	22	A13
22.	Increased sales		A18
23.	Regular competitor analysis	26	A73
24.	Benchmarking	26	A29
25.	Seeking information (proactively)	26	A64
26.	Knowledge of competition	28,29,30	A72
27.	Improved price	31	A14
28.	Better focused quotations	32	A13
29.	Recognise new products		A5
30.	More accurate pricing		A13
31.	Increased quote/sales conversion		A16
32.	More accurate discount rates	31	A27
33.	Top management support	34	A66
34.	Changing reward system	35	A99
35.	Performance/pay link	36,37	A37
36.	Increased sales motivation	38,39	A45
37.	Rewards best performers		A47
38.	Increase sales		A18
39.	Actively seek tenders		A9
40.	Top-level support	42	A66
41.	Focus on costs	44	A23
42.	Investment	44	A39
43.	Improved sales performance	42	A18
44.	Resources (availability)	46,47,48	A97
45.	Improve relationships with agents		A62
46.	More travel (present in 80 countries)	45,49	A44
47.	Better understand competition		A72
48.	Quotation process accuracy	50	A13
49.	Improve relationships with customers		A83
50.	Quote/sales conversion improved		A16

TQ Sales Manager 2 2nd Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Communication	4,5	A85
2.	Retaining sales staff	3	A35
3.	Experience of tender process	8	A10
4.	Working closely with engineering	8	A3
5.	Understanding customers	8	A82
6.	Developing relationships	5	A83
7.	Offering price-downs	8	A27

8.	Beat sales targets	10,11,12,13	A74
9.	Recognising costs	8	A23
10.	Profitability		A17
11.	Continue improved sales performance	14	A18
12.	Affects morale (positively)	15	A53
13.	Lose sales to aggressive local competition (market share)	17	A98
14.	Improve market share	10	A98
15.	Motivation	16	A45
16.	Look for business	8	A9
17.	Eventually firm will fold		A20
18.	Communication	21	A85
19.	Personalities of sales staff	21	A41
20.	Acting on customer feedback	24	A89
21.	Developing relationships with agents	24	A62
22.	Increased travel	24,21	A44
23.	Larger budget	22	A31
24.	Customer relationships	26,27,28,30,29	A83
25.	Fulfil requirements	31	A87
26.	Recognise customer requirements	25,31,32	A82
27.	Choose our firm over competitors		A24
28.	Tighter quotations	33	A13
29.	Reputation enhanced		A78
30.	Potential for new products		A5
31.	Retain business		A84
32.	more sales		A18
33.	Better sales/quote rate		A16
34.	Market knowledge	36	A29
35.	Local agents	36	A62
36.	Information	40	A64
37.	Experience of sales force	41	A34
38.	Present in all tenders	41	A11
39.	Quote/sales conversion rate	41	A16
40.	Understanding customers	39	A82
41.	Winning business	42,43,44	A18
42.	Market share	46	A98
43.	Improve competitive position	46	A24
44.	Job security	45	A42
45.	Motivation	41	A45
46.	Profitability		A17

RDS 2

1.	Regular meetings	3,4	A85
2.	Culture change (to collaboration)	5	A48
3.	Sales understanding	5	A33
4.	Communication with sales	5	A57
5.	Engineering support	7,8,9,10	A3
6.	More sales		A18
7.	Give the customers what they want	6,11	A82
8.	Better after sales service	11	A70
9.	New products	6,12,13	A5
10.	Can't provide customer requirements		A82
11.	Keep our present customers		A84
12.	New markets		A95
13.	New customers		A90
14.	Experience	17,19	A34
15.	Engineering support	16	A3
16.	Product quality	20	A7
17.	After sales service	20	A70
18.	Time in the market	20	A77
19.	High quality sales service	20	A71
20.	Reputation	21,22,23	A78
21.	Recall us first	24	A92
22.	Easier to win business	24	A86
23.	Keep customers		A84
24.	More sales		A18

Sales Manager 3 1st Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Experience of sales team	4	A34
2.	Close links to directors	5	A65
3.	Recognition of non-sales achievements	6	A36
4.	Knowledge of marketplace	8	A29
5.	Agreed targets	8,6	A74
6.	Motivation of sales team	8	A45
7.	Bonus linked rewards	6	A37
8.	Increase sales	9,10,11	A18
9.	Free up money for investment in future of firm	12	A39
10.	Contribute to profitability of firm		A17
11.	Ensure long-term future for firm		A20

12.	Increase resources for actively seeking sales		A97
13.	Communication of features	16	A85
14.	Links to rewards	16	A37
15.	Training	19,16	A50
16.	Commitment of team	19	A47
17.	Investment	19	A39
18.	Increasing sales	17	A18
19.	New technology	21,23,24	A79
20.	Easier to buy	25	A80
21.	Form better ways of communicating with customers	20,26,22	A89
22.	Understand exact requirements		A82
23.	Cut expenditure		A26
24.	Access to information	28,29	A64
25.	Sales		A18
26.	Better response times	27	A88
27.	Quality of service		A71
28.	Access earlier orders	27,30	A88
29.	Product specifications to customer faster		A88
30.	Quotation accuracy		A13
31.	More responsibility for agents	35	A61
32.	Restructuring	35	A46
33.	Decreased travel	37	A44
34.	New technology	37	A79
35.	Efficiency improvements	37	A99
36.	Inter-departmental communication	35	A57
37.	Cost savings	38,39,40	A23
38.	Offer discounts to customers	41	A27
39.	Money available for investment		A39
40.	Compete with aggressive competition		A24
41.	Sales		A18

RDS 2

1.	Training	2	A50
2.	Flexibility of administration staff	5	A51
3.	More administrative staff	5	A38
4.	Restructuring	5	A46
5.	Administrative support	6,7,8	A67
6.	Gives managers time to concentrate on winning		A9

	tenders		
7.	More efficient sales process	9	A98
8.	Quality of customer service		A71
9.	Cost savings		A23
10.	Investment	12	A39
11.	Carefully selecting agents	15	A60
12.	New technology	15,13	A79
13.	Communication	15	A85
14.	Willingness of sales team	13	A47
15.	Agent contact	16,17,18,19	A62
16.	Better local knowledge	20	A29
17.	Closer to the customer	21,22	A83
18.	Decrease reliance on travel	23	A44
19.	Become further away from the customer	24	A83
20.	Beat local competition		A96
21.	Understand future needs		A82
22.	Respond to after-sales service		A70
23.	Cost savings		A23
24.	Misunderstandings		A82

Sales Manager 3 2nd Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Recognition	5	A36
2.	Market knowledge	7	A29
3.	Backup from other departments	7	A33
4.	Bonus scheme	5	A37
5.	Motivation of team	9	A45
6.	Agent contact	9	A62
7.	Customer focus	9	A81
8.	Skills of sales (experience)	2,7	A34
9.	Increase sales	10,11,12,13,14	A18
10.	Lose out to competitors		A24
11.	Profitability		A17
12.	Money for investment		A39
13.	Job security	5	A42
14.	Growth of firm		A19
15.	Technology	19	A79
16.	Experience of sales	20	A34
17.	Relationship with agents	20	A62
18.	Motivation of sales	20	A45
19.	Customer information analysis	20	A76
20.	Close contact with customers	21,24,25,26,27	A83
21.	Overprice	22	A13

22.	Lose business		A84
23.	Choose our firm 'intuitively'	28	A92
24.	Builds customer loyalty	23	A86
25.	Customer wants	30,31	A82
26.	Customise products		A4
27.	Quality of service		A71
28.	Sales		A18
29.	Improve quote/sales ratio	28	A16
30.	Effective and accurate quotations	29	A13
31.	Know how much the customer is willing to pay	28	A14
32.	Training	36	A50
33.	Restructuring	36	A46
34.	Commitment across the firm	36	A47
35.	Link to rewards	36	A37
36.	Flexibility	38,39,40	A51
37.	Understand customers		A82
38.	Flow of information	37,42	A85
39.	Responsiveness (customer)		A88
40.	Understand departments	41	A33
41.	More efficient processes	45	A99
42.	Competitor advantage		A24
43.	Sales		A18
44.	Discounted prices	43	A27
45.	Lower costs	44	A23

RDS 2

1.	Training of all staff	3	A50
2.	Investment	3	A39
3.	New technology	4,5,6,7	A79
4.	Improved service	8	A71
5.	Customer relationships	9,10	A83
6.	Reduce costs	10	A23
7.	Communication	12,13	A85
8.	Competitive advantage		A24
9.	Customised products		A4
10.	Tight pricing	8,11	A13
11.	Sales		A18
12.	Response times		A88
13.	Agent relationships		A62
14.	Decreased travel	17	A44
15.	New technology	17	A79
16.	Budgets	17	A31
17.	Expenditure	18,19,20	A26
18.	Cost reductions	21	A23
19.	Improves efficiency		A22

20.	Can't compete with low-margin competitors	23	A24
21.	Meet price-downs of customers	22	A27
22.	Win tenders		A18
23.	Company won't survive		A20

15.4.1 Education Sales Company Standard Terms Vocabulary

	<i>Standard Term</i>		<i>Standard Term</i>
A1	Marketing involvement	A51	Flexibility (tasks)
A2	Engineering skill	A52	Sales focussed
A3	Engineering involvement	A53	Staff morale
A4	Product customisation	A54	Sales coaching
A5	New product development	A55	Export conditions
A6	Firm offerings	A56	Empowerment
A7	Product quality	A57	Departmental communication
A8	Efficient product development	A58	Downward communication
A9	Proactive in seeking tenders	A59	Sales/agent communication
A10	Experience of tender process	A60	Agent selection
A11	Present in all possible tenders	A61	Agent responsibility
A12	Tender specifications	A62	Agent relationships
A13	Quotation accuracy	A63	Agent motivation
A14	Quotation competitiveness	A64	Access to information
A15	Profit margins	A65	Leadership involvement
A16	Quote/sales conversion	A66	Leadership support
A17	Profitability	A67	Administrative support
A18	Sales	A68	Competitor strategies
A19	Firm growth	A69	Competitor offerings
A20	Firm survival	A70	After-sales care
A21	Market leadership	A71	Service quality
A22	Cost efficiency	A72	Competitor knowledge
A23	Costs	A73	Competitor analysis
A24	Competitive advantage	A74	Performance targets
A25	Confidence in firm	A75	ERP system
A26	Expenditure	A76	Information systems
A27	Discounts	A77	History of firm
A28	Forecasts	A78	Reputation
A29	Market knowledge	A79	New technology
A30	Long-term planning	A80	Web sales
A31	Budgets	A81	Customer focus
A32	Attitudes	A82	Customer requirements
A33	Inter-departmental cohesion	A83	Customer relationships
A34	Experienced sales staff	A84	Customer retention
A35	Employee retention	A85	Communication

A36	Employee recognition	A86	Customer loyalty
A37	Rewards	A87	Customer satisfaction
A38	Recruitment	A88	Customer responsiveness
A39	Investment	A89	Customer communication
A40	Communicate financial realities	A90	New customers
A41	Personalities	A91	Price insensitivity
A42	Job security	A92	Brand recall
A43	Patience	A93	External focus
A44	Travel	A94	Decision making
A45	Employee motivation	A95	New markets
A46	Restructuring	A96	Local competition
A47	Employee commitment	A97	Resources
A48	Culture change	A98	Market share
A49	Network relationships	A99	Firm processes
A50	Training		

15.5 APPENDIX E: CASE STUDY D - TRANSPORTATION COMPANY
ENGINEERING TEAM RAW DATA SHEETS

Operations (Senior) Manager *1st Interview*

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Plant improvement	10	F71
2.	Innovation	6	F68
3.	Site configuration	6	F96
4.	Improve bid process	10	F41
5.	Meeting CODE 30+	10	F46
6.	Process improvements	5,10	F71
7.	Reducing complexity	10	F87
8.	Re-shape the supply chain	10	F81
9.	Reduce total material costs	10	F48
10.	Reduce costs	11,15,12,16,13,14	F75
11.	Profitability		F60
12.	Operational effectiveness		F72
13.	Increase margins		F60
14.	Security of Derby as manufacturing plant		F69
15.	Remain competitive		F66
16.	Requirement to meet globally imposed targets		F62
17.	Customer involvement	22	F20
18.	Quality control and testing	22	F53
19.	Process improvements	22	F71
20.	6 sigma philosophy	22	F50
21.	Functional communication	22	F83
22.	Operational effectiveness	23,24,25	F72
23.	Improved health and safety		F84
24.	Reduce costs	26	F75
25.	Material cost savings		F48
26.	Shareholder investment		F78
27.	Redesign workflow	31	F97
28.	Communication	32	F83
29.	Integrity	35	F12
30.	Positive feedback	35,33	F7
31.	Change working practices	35	F71
32.	Clear instructions	35,33	F85
33.	Clarifying roles	35	F4
34.	Link to rewards	35	F1
35.	Improve accountability	36,37	F9
36.	Clear where responsibility lies	38,39	F10
37.	Enthusiastic people		F12
38.	Recognition for a job well done		F2
39.	Clear who must improve		F9

RDS 2

1.	Top management support	5	F92
2.	Inspirational leadership	5	F93
3.	Participation	9	F3
4.	Compete with other teams re innovative ideas	8	F3
5.	Culture of excellence	9	F18
6.	TQM	9	F49
7.	6 sigma	9	F50
8.	Teamwork	9	F16
9.	Continuous improvement	10,11,14,12,15,13	F64
10.	Improve quality		F56
11.	Keep up with technology		F68
12.	Innovative products		F33
13.	Innovative processes		F71
14.	Better than competitors		F61
15.	Improve profitability	16	F60
16.	Secure Derby site		F69
17.	Workforce commitment	23	F12
18.	Training	19	F6
19.	Skilled workforce	27	F11
20.	P8 management	27	F45
21.	Control specs	27	F53
22.	Workflow layout	27	F97
23.	Continuous improvement	27	F64
24.	Internal test reports	27	F53
25.	Field reports	27	F53
26.	Innovation	27	F68
27.	Quality (products)	28,29,33,30	F37
28.	Reduce (un)reliability costs	31	F30
29.	Reduction of snags	32	F55
30.	Customer needs		F26
31.	Cost savings		F75
32.	Process cost savings		F75
33.	Control of disruptions		F72

Operations (Senior) Manager 2nd Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Customer information management	7	F95
2.	Quality	7	F37
3.	Design workflow improvements	8	F97
4.	Project management focus	12	F88
5.	Closer staff contact	9	F71
6.	Establish global network	12	F82

	relationships		
7.	Customer relationships	12	F25
8.	Site re-configuration	12	F96
9.	Supplier relationships	12,11	F80
10.	Information management	9	F95
11.	Materials procurement	12	F47
12.	Cost reduction	13,14,17,15,16	F75
13.	Profitability		F60
14.	Remain competitive		F66
15.	Improved bidding success	14,13	F40
16.	Safety of jobs		F65
17.	Meet targets		F62
18.	Information management	20	F95
19.	Integrated processes (SMB)	22	F44
20.	Supplier relationships	22	F80
21.	Customer relationship building	20	F80
22.	Materials procurement	23,24	F47
23.	Better quality materials	25,26	F57
24.	Cost reductions	27,28,29	F75
25.	Less disruptions (process)	27	F71
26.	Improved product quality	27	F37
27.	Profitability		F60
28.	Security (jobs)		F65
29.	New orders		F59
30.	Employee commitment	32,33,34	F12
31.	Increase skills base	34	F11
32.	TQM	38	F49
33.	Focus on efficiency	38	F72
34.	Redesign (workflow)	38	F97
35.	Standardised practices	38	F87
36.	SMB	38	F44
37.	Reduce complexity	38	F87
38.	Processes (improvement)	39,40,41	F71
39.	Reduce defects	42,44,41	F34
40.	Cost savings	45,46	F75
41.	Quality	44	F37
42.	Improve reliability	43	F30
43.	Customer satisfaction		F23
44.	Reduce maintenance costs		F75
45.	Profitability		F60
46.	Security (jobs)		F65

RDS 2

1.	Employee contribution	2	F3
2.	Work redesign	5	F71
3.	Training and development of skills	5	F6
4.	Willingness of employees	3	F12
5.	Project management focus	6,8,15,9,10,11,12	F88
6.	Customer focus		F24
7.	Responsibility (ownership)		F10
8.	Accountability at each step	7,13	F9
9.	Focus skills (develop expertise)		F11
10.	Break stages down into identifiable units	16	F71
11.	Establish measurement systems		F53
12.	Establish feedback systems		F7
13.	Specialisation	14	F91
14.	Quality improvements		F56
15.	Reduce total material costs		F48
16.	Identify inefficiencies		F72
17.	Support systems	20	F94
18.	Reshape logistics	20	F81
19.	Employee commitment to change	20	F12
20.	Site improvements	21,26,22,23,24	F96
21.	Improve process efficiencies		F72
22.	Focus on customer needs		F24
23.	Break down stage into identifiable units	27	F71
24.	Ease of inspection	27	F53
25.	Cost reductions		F75
26.	Closer employee working relationships		F16
27.	Improve quality		F56

Engineering Manager 1st Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Suggestion scheme implementation	5	F3
2.	Rewarding staff	5	F1
3.	Integration of design data into manufacturing operations	10	F42
4.	'No blame' culture	5	F18
5.	Idea generation	10,8	F5
6.	SMB (Philosophy of the	10	F44

	manufacturing process) Integrates all activities		
7.	Training of staff	10	F6
8.	Innovation	10	F68
9.	Customer bespoke systems	10	F26
10.	Product choice	11,16,12,13	F32
11.	Customer satisfaction	15	F23
12.	Improve bids (for orders)	17	F40
13.	Competitive advantage	14	F61
14.	Future of Derby site		F69
15.	Suit customer needs		F25
16.	(firm) reputation		F63
17.	Meet year end targets		F62
18.	Training (w/force)	21	F6
19.	Organisational culture	22,27	F18
20.	P8 (defects and snags) management	28	F45
21.	Workmanship	28	F11
22.	Continuous feedback	28	F7
23.	Better working instructions	28	F85
24.	Continuous improvement (6 sigma)	28,20	F50
25.	Material purchasing	28	F47
26.	Stage checklists	28	F53
27.	Commitment to excellence	28	F12
28.	Quality (product)	29,32,30,33,34,31	F37
29.	Crashworthiness standards	32	F52
30.	Reputation		F63
31.	Reduce internal and external defects		F34
32.	Customer expectations		F21
33.	Reliability	32	F30
34.	Availability	32	F31
35.	Feedback	43	F7
36.	Ownership of tasks	43	F8
37.	Define roles and responsibilities	43	F4
38.	Develop customer support systems	43	F94
39.	Improve bid process	43	F41
40.	Increase standard features	43	F35
41.	Customer inspection	43	F22
42.	Culture (organisational)	43	F18
43.	Customer focus	44,45,46,47	F24
44.	Customer satisfaction	48	F23
45.	Win new orders	48	F59
46.	Ensure survival of Derby (site)	49	F69
47.	Improve bid success		F40

48.	Competitive advantage		F61
49.	Protect jobs		F65

RDS 2

1.	Quality control	4,5	F53
2.	Functional integration	8	F16
3.	SMB	8	F44
4.	Stage checklists	8	F53
5.	Material purchasing	8	F47
6.	Quality processes	8	F54
7.	P8 management	6	F45
8.	Reliability	9,10	F30
9.	Customer requirement (high penalties)	11,12	F21
10.	Meet quality targets		F62
11.	New orders		F59
12.	Increased sales		F59
13.	Money (from profits)	15	F78
14.	Recognition	18	F2
15.	Rewards	18	F1
16.	Involvement in decision making	18	F3
17.	Training	18	F6
18.	People	19,20,21,23	F62
19.	Meet targets	22,24,25,26	F62
20.	Provide quality		F58
21.	New ideas	27,28	F5
22.	Survival of Derby site		F69
23.	Process improvements		F71
24.	Competitive advantage		F61
25.	Cost savings		F75
26.	CODE 30+ (30% reduction on material costs)	13	F46
27.	Innovation (products)		F33
28.	Innovation (processes)		F68

Engineering Manager 2nd Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Recognition	3	F2
2.	Teamworking	3	F16
3.	Culture change	6	F18
4.	Rewards	3	F1
5.	Continuous improvement	8	F64
6.	Commitment to excellence	8	F12
7.	Quality control and testing	8	F53

8.	Quality (product)	9,10,11	F37
9.	Availability (of products)	13	F31
10.	Reliability	13	F30
11.	Maintenance costs lowered	12	F75
12.	Cost effectiveness		F76
13.	Required by customers		F21
14.	Production staff involvement	20	F3
15.	Control conformance of units to customer specifications	20	F53
16.	Change processes	20	F71
17.	Customer input	20	F20
18.	Ownership of tasks	20	F8
19.	Develop more secure customer relationships	20	F25
20.	Customer orientation	21,22	F24
21.	Recognise customer requirements		F21
22.	Satisfy customers	23	F23
23.	New orders		F59
24.	Design issues	30	F42
25.	Snagging and repairing	30	F53
26.	Improve accountability	30	F9
27.	Tooling issues	30	F98
28.	Re-configure site	30	F96
29.	Stage layouts	30	F97
30.	Process improvements	31,32,34,35,33	F71
31.	Increased efficiency in site configuration		F72
32.	Reduce production overheads		F74
33.	Reduce inventory levels		F79
34.	Reduce costs		F75
35.	Containment (not passing on poor quality)		F51
36.	Staff involvement	40	F3
37.	Rewards	40,36	F1
38.	Recognition of ideas	40	F2
39.	Employers view employees as more than robots	38	F92
40.	Innovation	41,46,42,47,43,44	F68
41.	New internal features	45	F35
42.	Reduce manufacturing costs		F74
43.	Quality improvements		F56
44.	Improve margins		F60
45.	Keep up with competitors		F61
46.	New external features		F35
47.	Process improvements	48	F71
48.	Cost leadership		F76

RDS 2

1.	Realise importance of people	5	F92
2.	Focus on people	5	F2
3.	Top management support	5	F92
4.	Commitment	8	F12
5.	Morale	4,8	F14
6.	Recruitment	8	F17
7.	Rewards	8	F1
8.	People	9,10,13,11,12	F11
9.	Reduce defects		F34
10.	Profitable products		F60
11.	Quality products		F37
12.	Quality services		F58
13.	Process improvements	14	F71
14.	Team efficiency improvements		F16

Production Manager 1st Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Reporting defects	8	F86
2.	SCM (supply chain management)	8	F81
3.	Tight controls	8	F53
4.	Design improvements (structural)	8	F42
5.	Site layout	8	F96
6.	Tooling problems	8	F98
7.	Skilled staff	8,4	F11
8.	Operational effectiveness	10,11	F72
9.	Standardised practice	8	F87
10.	Reduce production costs	13,14	F74
11.	Reduce high number of internal and external defects	14,12	F34
12.	Customer satisfaction	15	F23
13.	Money for machinery investment		F78
14.	Cost savings		F75
15.	Reliability		F30
16.	Feedback (continuous)	20	F7
17.	Regular contact	20	F83
18.	Supplier information systems	20	F94
19.	Improve supplier processes	20	F81
20.	Supplier relationships	25,21,28,22,30,23,24	F80
21.	Improve standard features (AV/HV/diagnostics)	29	F35
22.	More accurate bid process	29	F41

23.	Meet bespoke requirements	29,27	F26
24.	Understand cost implications and improvements		F77
25.	Customer cost reductions	26	F75
26.	Sales		F59
27.	Retain maintenance contracts		F36
28.	Reduce snags		F56
29.	Gain new orders		F59
30.	Reduce material costs (CODE 30+)		F46
31.	Communication processes	32	F83
32.	Standardised practices	40	F87
33.	Manpower issues (skills)	38	F11
34.	Training	38	F6
35.	Control disruptions	40	F71
36.	Conformance controls	35	F53
37.	Quality processes	40	F54
38.	TQM	40	F49
39.	Co-ordinated meetings (across functions)	40,32	F83
40.	Quality (product)	42,43,44,45,46	F37
41.	Containment	40	F51
42.	Customer satisfaction		F23
43.	Reduce defects	44	F34
44.	Increase orders		F59
45.	Reduce maintainability costs	47	F75
46.	Reputation (of firm)		F63
47.	Profitability		F60

RDS 2

1.	Praise and recognition	4	F2
2.	Feedback positive/negative	4	F7
3.	Culture change	5	F18
4.	Employee suggestions	8,9	F5
5.	Employee commitment	4,9	F12
6.	TQM	9	F49
7.	Regular meetings	9	F83
8.	Ownership of tasks	9	F8
9.	Continuous improvement	10,11,12	F64
10.	Improved quality		F56
11.	Develop product specs	15,16	F28
12.	Improve processes (cost improvements)	14	F71
13.	New and developing markets (European)		F70
14.	Cost effective		F76
15.	Internal features improvement	17	F33
16.	External feature improvement	17	F33

17.	State of the art products (high speed)	18,19,13	F38
18.	Product choice		F32
19.	Keep up with technology	20	F68
20.	Competitive advantage		F61
21.	Encourage teamworking	31	F16
22.	Financial rewards	31	F60
23.	Personal satisfaction	31	F14
24.	Obtaining recognition from peers	31	F2
25.	Factory working environment	31	F99
26.	Participation in decision making	31	F3
27.	Design improvements	31	F42
28.	Improving the way things are done (working practices)	31	F71
29.	Improving problem areas	31	F71
30.	6 sigma	31	F50
31.	Excellence	33,37,34,38,35,36	F12
32.	TQM	31	F49
33.	Reduce product costs	38	F39
34.	Business cost savings	39	F75
35.	Product improvements		F33
36.	Secure Derby site as leaders in manufacturing technology		F69
37.	Reduce overall materials costs		F48
38.	Win new orders	39	F59
39.	Competitive advantage		F61

Production Manager 2nd Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Project management	8	F88
2.	Knowledge management	8	F95
3.	Production involvement	8	F3
4.	Staff participation	8	F3
5.	Functional communication	8	F83
6.	Senior management support	8	F92
7.	Supply chain management	8	F81
8.	Improving processes	9,10	F71
9.	Efficiency improvements	11,12	F72
10.	Product improvements		F33
11.	Cost savings	13	F75
12.	Competitive advantage		F61
13.	Increase profit margins		F60
14.	Cultural excellence	16	F18
15.	Quality control	16	F53

16.	Quality targets	20	F55
17.	Materials procurement targets	20	F47
18.	Meet manufacturing times	20	F62
19.	Order targets	20	F62
20.	Results	21,22	F67
21.	Cost reductions (meet CODE 30+)	23	F46
22.	Competitive advantage		F61
23.	Firm success		F67
24.	Rewards	25	F1
25.	Employee commitment	34	F12
26.	Workmanship (skilled)	34	F11
27.	Test reports	34	F53
28.	Field testing	34	F53
29.	Material purchasing	34	F47
30.	Quality controls	34	F53
31.	Manufacturing set up	34	F97
32.	Design improvements	34	F42
33.	Feedback	34	F7
34.	Quality (products)	36,37,38	F37
35.	Customer inspection	34	F22
36.	Efficiency improvements		F72
37.	Reduce defects	39	F34
38.	Customer satisfaction		F23
39.	Improve reliability		F30

RDS 2

1.	Reduce inventory	12	F79
2.	Common language	7,8	F87
3.	Design improvements	12	F42
4.	Involvement of operatives	12	F3
5.	Sub contractor quality	12	F89
6.	Sub contractor speed of delivery	12	F89
7.	Process improvements	12	F71
8.	Supplier relationships	12	F80
9.	Material sourcing	12	F47
10.	Improving working practices	12	F71
11.	Accountability (for tasks)	12	F9
12.	Reducing costs	13,16,14,15	F75
13.	Meet targets		F62
14.	cost savings		F75
15.	Remain competitive		F66
16.	Remain viable	17	F66
17.	Survival of site		F69
18.	Deal with over capacity	28	F71
19.	Continuous improvement	28	F64

20.	Controls	26	F53
21.	Workforce abilities	19	F11
22.	Efficient processes	28	F72
23.	Meet sales targets	28	F62
24.	Customer focus	28	F24
25.	New orders (LU)	28	F59
26.	Quality targets	28	F55
27.	Operational effectiveness	28	F72
28.	Financial results	29,32,30,33,31	F60
29.	Doing things right		F72
30.	Survival of site		F69
31.	Indication of excellence		F67
32.	Profitability		F60
33.	Shareholder expectations (meeting)		F90

Project Quality Assurance Manager *1st Interview*

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Human resource management	2,3	F19
2.	Clear responsibilities	14	F10
3.	Clear roles	14	F4
4.	Skills of staff	14	F11
5.	Controlling disruptions	14	F71
6.	Commitment (employee)	7	F51
7.	Accountability	14	F9
8.	P8 management	14	F45
9.	TQM	14	F49
10.	Customer specs	14	F26
11.	SMB (philosophy)	14	F44
12.	Continuous improvement	14	F64
13.	Quality control processes	14	F53
14.	Quality (product)	15,16,17,18	F37
15.	Improve sales	20	F59
16.	Beat the competition	20	F61
17.	Reliability	21	F30
18.	Maintenance costs		F36
19.	Secure jobs	6	F65
20.	Success	19	F67
21.	Customer satisfaction		F23
22.	Change the management team	26	F92
23.	Standardised procedures	31	F87
24.	Clear controls	31	F53
25.	Communication	31,23	F83
26.	New engineering mindset	31	F12
27.	Reconfigure supply chain	31	F81
28.	Material sourcing	31	F47

29.	Improve working conditions	31	F99
30.	New ideas	31	F5
31.	Efficiency (processes)	32,33,38,34,35	F72
32.	Improve margins	37	F60
33.	Cost effectiveness	37,38	F76
34.	Company growth		F67
35.	Cost reductions		F75
36.	Motivation for workforce		F13
37.	Profitability	36	F60
38.	Win more orders	37	F59

RDS 2

1.	Communication skills	3	F83
2.	Recruitments of project managers	7	F17
3.	Functional integration	7	F16
4.	SMB	7	F44
5.	Development of skills	7	F15
6.	Training	5	F6
7.	Project management	8,9,13,10	F88
8.	Responsibility for identifiable projects	11,12	F10
9.	Accountability	12	F9
10.	Specialisation	14	F91
11.	Motivational		F13
12.	Tighten controls		F53
13.	Improve costings		F77
14.	Efficiency improvements		F72
15.	Design improvements	20	F42
16.	Labour costs	20	F74
17.	Process efficiency	20	F72
18.	Production efficiency	20	F72
19.	SCM	20	F81
20.	Controlling costs	23,21,22	F76
21.	Improve margins		F60
22.	Money for investment		F78
23.	Remain competitive		F66
24.	Understand customer requirements	32	F21
25.	Communication across teams	32	F83
26.	Customer interaction	32	F25
27.	Product testing	32	F29
28.	Clear specs	32,25	F85
29.	Innovative products	32	F68
30.	Quality focus	32	F37
31.	Customer involvement	32	F20
32.	Customer specs	33,34,35	F26

33.	Retain customers		F27
34.	Customer satisfaction	36	F23
35.	New orders	37,38	F39
36.	Reputation of (firm)		F63
37.	Profitability		F60
38.	Firm survival		F66

Project Quality Assurance Manager 2nd Interview

RDS 1

	<i>NLU</i>	<i>Effect</i>	<i>STAG</i>
1.	Regular meetings	3,9	F83
2.	Training	10	F6
3.	Common language	10	F87
4.	Commitment (all employees)	10	F12
5.	P8 management	10	F45
6.	Stage checklists	10	F53
7.	Continuous improvement	10	F64
8.	Tight controls	10	F53
9.	Standardised procedures	10	F87
10.	Quality (product)	11,12,18,13,14,15	F37
11.	Reduce snagging and repairing	16	F36
12.	Expectation of customers	17	F21
13.	Competitive advantage		F61
14.	Improves reliability		F30
15.	Improves availability		F31
16.	Reduce costs	13	F75
17.	Retain business		F27
18.	Reputation	19	F63
19.	New business		F59
20.	Improve meeting frequency	25	F83
21.	Involvement in decision making	25	F3
22.	Relationship building	25	F71
23.	Re-configure supply chain	25	F81
24.	Information flows	25	F95
25.	Supplier relationships	26,27	F80
26.	Better understanding of needs	28,29,30	F26
27.	Reduce inventory	28	F79
28.	Cost improvements		F39
29.	Specialised components		F33
30.	React quickly to needs		F21
31.	Assessments	33	F19
32.	Feedback	33	F7
33.	Recognising skills gaps	39	F11
34.	Recognition of achievements	39	F2
35.	Individual incentives	39	F1

36.	Involvement of people	39	F3
37.	Commitment of senior managers	39	F92
38.	Provide more opportunities	39	F15
39.	Training	40,41	F6
40.	Innovation	42,44,45	F68
41.	Quality improvements	46	F56
42.	Better products	43	F37
43.	Sales		F59
44.	New products	43	F38
45.	Improved processes		F71
46.	Competitive advantage	35	F61

RDS 2

1.	Culture change	9	F18
2.	Training	7	F6
3.	Employee buy-in	7	F12
4.	Feedback on performance	9	F7
5.	Clear targets	4,9	F62
6.	Process improvements	9	F71
7.	SMB	9	F44
8.	Recognise potential cost implications	9	F77
9.	Cost focus	10,11,12,13,15,16	F76
10.	Profitable products		F60
11.	Recognise cost savings		F75
12.	Improve margins	13	F60
13.	Company success	18,14	F67
14.	Growth of firm		F70
15.	Customer's are able to increase orders		F59
16.	Improve bid success	17	F40
17.	Sales		F59
18.	Secure jobs		F65
19.	Receptive management	23	F92
20.	Recognition of contribution	23	F2
21.	Teamworking	23	F16
22.	Controls	26	F53
23.	Idea generation	26	F5
24.	Technology	26	F68
25.	Clarity of roles	26	F4
26.	Process efficiency	27	F72
27.	Cost savings	29,30	F75
28.	Keep up with competitors		F61
29.	Competitive advantage		F61
30.	Money for technological investments	31,32,28	F78

31.	Better products		F33
32.	Services		F58

15.5.1 Transportation company standard terms vocabulary

F1	Employee rewards	F51	Quality containment
F2	Employee recognition	F52	Quality standards
F3	Employee involvement	F53	Quality control
F4	Employees roles	F54	Quality processes
F5	Employee ideas	F55	Quality targets
F6	Employee training	F56	Quality improvements
F7	Employee feedback	F57	Quality materials
F8	Employee ownership	F58	Quality services
F9	Employee accountability	F59	Sales
F10	Employee responsibility	F60	Profitability
F11	Employee skills	F61	Competitive advantage
F12	Employee commitment	F62	Targets
F13	Employee motivation	F63	Firm reputation
F14	Employee satisfaction	F64	Continuous improvement
F15	Employee development	F65	Job security
F16	Team working	F66	Firm survival
F17	Recruitment	F67	Firm success
F18	Organisational culture	F68	Innovation
F19	Human resource management	F69	Survival of site
F20	Customer involvement	F70	New markets
F21	Customer expectations	F71	Process improvements
F22	Customer inspection	F72	Process efficiency
F23	Customer satisfaction	F73	Process controls
F24	Customer focus	F74	Production costs
F25	Customer relationships	F75	Cost reduction
F26	Customer specifications	F76	Cost effectiveness
F27	Customer retention	F77	Costing
F28	Product specifications	F78	Investment
F29	Product testing	F79	Inventory levels
F30	Product reliability	F80	Supplier relationships
F31	Product availability	F81	Supply chain management
F32	Product range	F82	Global network relationships
F33	Product development	F83	Communication
F34	Product defects	F84	Health and safety
F35	Product features	F85	Work instructions
F36	Product maintenance	F86	Defect reporting
F37	Product quality	F87	Standardised practice
F38	New products	F88	Project management
F39	Product price	F89	Sub contractors
F40	Bid success	F90	Shareholder expectations
F41	Bid process	F91	Task specialisation
F42	Design function	F92	Senior management

F43	Engineering function	F93	Leadership
F44	(Firm) manufacturing philosophy	F94	Support systems
F45	(firm) defects and snags management programme	F95	Information flows
F46	(firm) reduction on material costs policy	F96	Site configuration
F47	Material procurement	F97	Workflow
F48	Material costs	F98	Tooling
F49	Total Quality Management	F99	Working conditions
F50	6 Sigma		