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Moving from HRM to knowledge productivity: a study of  
whether and how organizations become learning organizations.

HELEN J. SHIPTON

Thesis submitted for the Degree of Doctor of Philosophy

ASTON UNIVERSITY

January 2004

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## ASTON UNIVERSITY

### Moving from HRM to knowledge productivity: a study of whether and how organizations become learning organizations

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#### Thesis summary

Practitioners and academics are in broad agreement that, above all, organizations need to be able to learn, to innovate and to question existing ways of working. This thesis develops a model to take into account, firstly, what determines whether or not organizations endorse practices designed to facilitate learning. Secondly, the model evaluates the impact of such practices upon organizational outcomes, measured in terms of product and technological innovation.

Researchers have noted that organizations that are committed to producing innovation show great resilience in dealing with adverse business conditions (e.g. Pavitt, 1991; Leonard Barton, 1998). In effect, such organizations bear many of the characteristics associated with the achievement of 'learning organization' status (Garvin, 1993; Pedler, Burgoyne & Boydell, 1999; Senge, 1990). Seven studies are presented to support this theoretical framework. The first empirical study explores the antecedents to effective learning. The three following studies present data to suggest that people management practices are highly significant in determining whether or not organizations are able to produce sustained innovation. The thesis goes on to explore the relationship between organizational-level job satisfaction, learning and innovation, and provides evidence to suggest that there is a strong, positive relationship between these variables. The final two chapters analyze learning and innovation within two similar manufacturing organizations. One manifests relatively low levels of innovation whilst the other is generally considered to be outstandingly innovative. I present a comparative framework for exploring the different approaches to learning manifested by the two organizations.

The thesis concludes by assessing the extent to which the theoretical model presented in the second chapter is borne out by the findings of the study. Whilst this is a relatively new field of inquiry, findings reveal that organizations have a much stronger chance of producing sustained innovation where they manage people proactively where people profess themselves to be satisfied at work. Few studies to date have presented empirical evidence to substantiate theoretical endorsements to engage in higher order learning, so this research makes an important contribution to existing literature in this field.

Key words: people management, job satisfaction, learning mechanisms, human resource practices.

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### Declaration

The following publications and conference papers have arisen from the work contained in this thesis:-

Shipton H., West M, Dawson, J, Patterson M. & Birdi, K. (2003). Organizational learning as a predictor of innovation. Paper presented at the 11<sup>th</sup> European Congress on Work and Organizational Psychology, May, Lisbon.

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Shipton H., West, M., Dawson J. & Patterson M. (2001). Learning in manufacturing organisations: what factors predict effectiveness? Human Resource Development International, May.

Shipton, H., West, M., Patterson M. & Birdi K. (2002). Organizational learning and innovation. CIPD Professional Standards Conference, Keele University.

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Shipton H., West, M., Dawson, J. & Patterson M. (2001). Empowerment and learning in manufacturing organizations. International Conference of Knowledge Management, Leicester University, April.

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August 2002

### APPENDIX 5

Paper published in Human Resource Development  
International, March 2001.

MOVING FROM HRM TO KNOWLEDGE PRODUCTIVITY: A STUDY OF  
WHETHER AND HOW ORGANISATIONS BECOME LEARNING  
ORGANIZATIONS.

Introduction

‘Product development and product-based competition is often only the last 100 yards of a  
marathon’

Gary Hamel, Visiting Professor, London Business School.

What steps can organizations take to ensure that they are in a commanding position in the last stages of the race? How can they capture the knowledge of individuals and generate the organizational-level learning which many believe lies at the heart of competitive success?

I propose in this thesis that the race is won or lost according to the importance attached to people management. Effective people management not only encourages individuals constantly to update their skills and knowledge. It also creates mechanisms whereby new ideas are considered, discussed and, ultimately, implemented. So effective people management generates the organizational learning required to produce innovation on a sustained basis. A number of commentators make reference to this relationship: McKee (1992), for example, notes that ‘individual product innovations require organizational learning, and organizations can learn to institutionalize innovation.’ An ancient philosopher writing in a different era made much the same point: ‘We are what we repeatedly do. Excellence, then, is not an act but a habit.’

To what extent is such effort worthwhile? Practitioner and academic literatures assert that organizations which are able to produce innovation on a sustained basis will

achieve competitive advantage. As one commentator observes: 'the benefits of embracing innovation widely across a company include greater flexibility for exploiting opportunities and better adaptability to change.' (Zentner, 2003, p.5). In other words, through innovating, organizations respond and anticipate changes in the external environment and recognize what action they need to take to exploit such opportunities. Researchers have noted that organizations operating in this way show great resilience in dealing with adverse business conditions (e.g. Leonard Barton; 1998; Pavitt, 1991). In effect, such organizations bear many of the characteristics associated with the achievement of 'learning organization' status (Garvin, 1993; Pedler, Burgoyne & Boydell, 1999; Senge, 1990).

Evidence suggests, however, that relatively few organizations are able to work in this way. A recent survey conducted by the Department for Trade and Industry (D.T.I.) (2003), for example, indicates that UK firms introduce fewer new or improved products or processes than almost all of their European competitors. Findings derived from the research exercise drawn upon for this thesis suggest that UK manufacturing firms are, generally speaking, by no means outstandingly innovative. For example, on a scale of 1-7, with 1 representing low levels of innovation and 7 outstandingly high levels, 10 of the 74 organizations in the sample scored 5 or more for product innovation, 3 scored 5 or more for innovation in technical systems, and 2 scored 5 or more for overall innovation (including administrative systems). This divergence of practice is deserving of further comment. As a commentator in the business press recently proposed: 'Anyone who has ever noticed that some companies are successful while other similar ones merely survive, should be asking the question: why? What is the difference between success and failure

and how is it that one enterprise surges ahead, at the same time as another similar one lurches from crisis to crisis?’ (Blair, 2003, p. 12).

There are a number of possibilities which help to explain why it is difficult to achieve high levels of innovation. The organizational learning literature reveals that training activity frequently fails to deliver positive outcomes for the organization because it takes insufficient account of the need to expose people to new and different experiences. Critical theory also suggests that developmental activity often fails to recognise how the workplace itself shapes peoples’ perceptions of what they need to know and why. Finally, best practice HR literature proposes that one needs to establish a coherent framework for the management of people, a framework intended to provide focus and direction for the development of skills in the workplace. People management practices designed to enhance learning therefore should be strategically deployed and perceived as relevant, whilst at the same time challenging existing thinking. These considerations guide the theoretical rationale for the research, presented in the first and second chapters.

### Why manufacturing?

The thesis focuses specifically upon organizational learning and innovation in manufacturing organizations and considers the relationship between people management practices and product/ technological innovation. There are a number of reasons for this approach. Firstly, it makes sense methodologically to focus upon innovation in manufacturing organizations rather than innovation in service industries, since doing so enables me to distinguish clearly between dependent and independent variables. For example, I was interested in exploring the extent to which there was a relationship

between mechanisms established to facilitate customer interaction and innovation. Had I been looking at the service industry, it is possible that such a mechanism would in itself be defined as an innovation (as was the case when HSBC trained counter staff to sell mortgage products to customers entering the bank). Product and technological innovation are, however, sufficiently discrete as outcome variables to make it possible to draw sensible inferences about cause and effect.

The second reason for focusing upon manufacturing organizations lies in the way in which the sector as a whole continues to be an important driver for economic prosperity. For example, statistics show that manufacturing continues to account for 62% of all exports (D.T.I., 2000). Furthermore, there is evidence to suggest that services are not traded externally to the same extent, suggesting that a 5% fall in manufacturing exports would require services to increase by three times this to make up the difference (Engineering Employers' Federation, (EEF) 2001). In addition, one study shows that innovation is more prevalent in the manufacturing than the services sector (EEF, 2001). Other work, drawing comparisons between nations, suggests that countries with relatively larger manufacturing sectors tend to be more prosperous. This holds both for advanced European economies and developing nations in East Asia and Latin America (EEF, 2001).

#### Research setting and timing

The thesis draws substantially from the work of the Aston Organizational Effectiveness Programme, based jointly at the Centre for Economic Performance, London School of Economics and the Work and Organizational Psychology Group at Aston Business School. This is a ten-year longitudinal study (1990- 2000) that examines

market environment, organizational characteristics and managerial practices in just over one hundred manufacturing organizations. The research exercise was designed to meet a number of objectives, outlined in detail in chapter 3. One of the key purposes of the programme was to identify what managerial practices were likely to predict successful organizational performance and innovation. There was thus substantial data available to make it possible for me to meet some of the key research objectives of the thesis, namely, to identify what people management practices and learning mechanisms were likely to predict innovation, and why. The studies presented in chapters 3- 7 draw upon data generated in the course of this wider research programme. These studies are quantitative, thus making it possible to derive general conclusions from the research studies presented.

The final two chapters of the thesis, chapters 8 and 9, adopt a qualitative approach and explore the perceptions of employees and managers about learning and innovation within their organizations. The research exercise described in chapter 8 was conducted by the author within a local organization, RPL, which is part of the Japanese-owned Ricoh Group. The data and conclusions outlined in chapter 9 were drawn from transcriptions of interviews conducted with a number of key personnel during the course of research carried out at Raychem UK (this was part of the much larger exercise referred to above). Both these case studies provided valuable material to make it possible for me to develop in more detail some of the themes touched upon in the quantitative studies- for example, the role of an emphasis on quality in predicting a commitment towards higher order learning.

## Overview of the thesis

Seven studies are presented to support the theoretical framework referred to above. The first empirical study explores the antecedents to effective learning. It takes a longitudinal approach and establishes that a number of factors, such as a quality orientation and commitment to sophisticated HR practices are likely to determine whether or not organizations adopt practices designed to enhance learning. A scale encompassing fourteen questions (intended to measure learning orientation) is used as the outcome variable for the study.

The three following studies present data to suggest that people management practices are highly significant in determining whether or not organizations are able to produce sustained innovation. The first of the three chapters considers the extent to which mechanisms associated with human resource development activity predict technological innovation. The second study takes into account the impact of Human Resource (HR) practices such as appraisal and induction upon product and technological innovation. The third study in this section investigates the possibility that Human Resource Management (HRM) and Human Resource Development (HRD) practices have a particularly pronounced effect upon organizational learning where they are used in conjunction with one another. Few studies to date have presented empirical evidence to substantiate theoretical endorsements to engage in higher order learning, so this research makes an important contribution to existing literature in this field.

The thesis goes on to explore the relationship between organizational-level job satisfaction, learning and innovation, and provides evidence to suggest that there is a strong, positive relationship between these variables. The study also indicates that

employees attach high value to aspects of the work climate which facilitate their learning and growth. Since people management practitioners are concerned above all with developing practices to enhance motivation and satisfaction at work, these are important findings.

The final two chapters take a qualitative rather than a quantitative approach. The first of the two chapters explores in detail individuals' perceptions of the learning opportunities presented to them. It does so by analyzing learning and innovation within the two similar manufacturing organizations detailed above – Ricoh and Raychem UK. Ricoh manifests relatively low levels of innovation whilst Raychem is generally considered to be an outstandingly innovative organization. The second of the two qualitative chapters develops a comparative framework for exploring the different approaches to learning manifested by the two organizations. Analysis suggests that high levels of innovation are produced where there is evidence of a strong commitment to promoting learning at a strategic level and a priority attached to team-working.

The thesis concludes by assessing the extent to which the theoretical model presented in the second chapter is borne out by the findings of the study. Whilst this is a relatively new field of inquiry, findings reveal that organizations have a much stronger chance of producing sustained innovation where they manage people proactively and where people profess themselves to be satisfied at work. The thesis thus builds upon the substantial body of evidence already published (detailed in the following chapter), investigating the people management/ performance relationship. Its unique contribution, however, lies in its analysis of the people management/ innovation relationship, and in its

central premise that effective people management generates the organizational- level learning necessary to achieve creative outcomes.

## CHAPTER 1

### People management and organizational learning.

‘Things which matter most must never be at the mercy of things which matter least.’

Goethe

What matters most in organizational life? Practitioners and academics are in broad agreement that, above all, organizations need to be able to learn, to innovate and to question existing ways of working. What matters least is being committed to principles and ideas that are no longer appropriate. Yet such ideas are easier to endorse than to apply. This thesis develops a model to take into account, firstly, what determines whether or not organizations endorse practices designed to facilitate learning. Secondly, the model evaluates the impact of such practices upon organizational outcomes, measured in terms of product and technological innovation

The basis premise of the thesis is that learning mechanisms supported by people management practices facilitate organizational learning. Sustained innovation is produced where organizations are able to capture the learning of individuals, to systematically evaluate new ideas as people work together and to develop procedures to put such ideas into practice. Employee development activities, conducted within a strategic framework and supported by processes such as appraisal and induction, make it possible for individuals to acquire, share and enact knowledge. They also (where effectively conducted) present a sense of direction for learning, making plain the organization’s commitment to development and learning and enabling people to gain the skills necessary to engage in collaborative dialogue with others.

This chapter is divided into four sections. The first part of the chapter defines organizational learning, making reference to the 'learning organization' perspective, and presenting a brief analysis of different theoretical approaches. The second section explores the rationale for the relationship between people management, organizational learning and innovation. It draws upon knowledge and resource-based perspectives and makes reference to the significance of theories of social capital. Thirdly, using Crossnan, Lane and White's (1999) four-stage model of organizational learning, the chapter explores in detail how people management has the potential to impact positively on all four stages of the model.

Finally, the chapter considers empirical arguments in favour of the relationship between people management and organizational performance. Most of the literature investigating people management/ performance relationships has taken into account outcome measures such as profitability/ productivity, turnover and / or absenteeism (Delery & Doty, 1996; Dyer & Reeves, 1995; Huselid, 1995; Huselid, Jackson & Schuler, 1997; Koch & McGrath, 1996; Patterson & West, 1998). This thesis considers instead the relationship between people management and organizational innovation. This association has rarely been explored in published literature before (see Laursen & Foss, 2003). However, research shows that organizations able to innovate on a sustained basis tend to remain competitive over the course of time, possibly because they are flexible enough to respond to new challenges and opportunities with which they are faced (Geroski, 1994; 1995). Furthermore, many scholars suggest that innovation is one outcome of effective organizational learning (Nonaka & Takeuchi, 1995; Tushman & Nadler, 1996). Therefore, to achieve the main objective of the thesis, it made sense to

measure this outcome variable. This made it possible to consider the relationship between people management and innovation, and to explore the rationale for any positive findings.

### Defining organizational learning

The challenges faced by organizations in the turbulent business climate of recent years are well documented (Beer, Russel, Eisenstat & Biggadike, 1996; Brown & Eisenhardt, 1998; Collis, 1996; Fiol & Lyles, 1985; McGrath, 2001). The pressures of globalization, technological advance and changing patterns of customer demand have created a competitive arena for business survival and advancement. For these reasons, practitioners and academics are concerned with how to develop more responsive, flexible organizations. Walsh's (1996) comment is typical:

'The desire and ability of an organization to continuously learn from any source and to rapidly convert this learning into action- is its ultimate source of competitive advantage.'

Practitioners and consultants have put forward many ideas to suggest that organizations can achieve competitive advantage through managing learning effectively. Pedler, Boydell & Burgoyne (1999), for example, argue that a learning organization "facilitates the learning of all its members and consciously transforms itself and its context", thereby keeping ahead of the competition and manifesting the flexibility required to effect change. Senge (1990) draws attention to the importance of individuals achieving "personal mastery", a situation whereby people have discovered their talents and the unique contribution that they are able to make. 'Enabling structures' (Pedler, Boydell & Burgoyne, 1999) allow people the freedom to overcome challenges and

develop their sense of identify and meaning. 'Double- loop' learning (Argyris & Schon, 1978; Argyris, 1990) causes people to question the underlying premise behind an activity (single loop learning) or examine the 'governing variables' behind the intention by challenging the underlying values (double-loop learning). Pedler et. al. emphasize the importance of developing practices for 'looking out' and 'looking in' - making contacts in the external environment which can help to re-shape thinking and also encouraging this process to happen within the internal context. Senge identifies the need to expose individuals' 'mental models', in order for employees to question and restructure their internal pictures of the world. Garvin (1993) argues that a more systematic approach towards training and processing information will increase the probability of organizations identifying cause/ effect relationships. Stewart (1996) proposes that four general features can be observed in learning organizations: a commitment to self-development, the existence of activities designed to encourage and support learning, methods and processes which facilitate the dissemination and sharing of learning and a culture which is supportive of risk-taking and experimentation. Much of the thinking behind the learning organization ideas surrounds how to develop an enhanced capacity to question and reflect, and therefore move away from limited perceptual frameworks (Pearn, Rogerick & Mulrooney, 1995; Stata, 1989; Stalk, Evans & Shulman, 1992; Watkins & Marsnick, 1994). Thus, writers from this perspective suggest that a series of organizational arrangements will lead to enhanced learning: providing people with direct feedback on their performance, decentralizing and reducing bureaucracy to support initiatives and creativity, emphasizing expertise development, encouraging contributions from all levels of the company and creating open communications with a minimum of defensiveness

(Argyris and Schon 1978; Daft, 1998; Garvin 1993; Pearn, Rogerick & Mulrooney, 1995; Pedler, Burgoyne & Boydell, 1999, Stata, 1989; Stalk, Evans & Shulman, 1992; Watkins & Marsnick, 1994).

There is some disillusionment with the 'learning organization' concept, partly because it does not appear to take account of the relationship between individual and organizational learning and partly because there is little empirical justification in support of the ideas put forward (Lahteenmaki, Toivonen & Mattila, 2001; Sloman, 1999; Tsang, 1997). Scholars of organizational learning adopt a more critical approach, attempting to explain how the process happens and whether or not it is necessarily likely to result in positive outcomes for the organization (Easterby-Smith, 1999). The table detailed below presents a comparative framework for understanding the main themes adopted and locates the learning organization literature within this framework.

*A comparative framework for understanding approaches to organizational learning*

| Theme   | Authors  | Process   | Outcomes  | Problems with approach  |
|---|--|---|---|---|
| The learning organization:- Learning can be managed for competitive advantage                             | Pedler, Burgoyne & Boydell, 1999<br>Senge, 1990;<br>Garvin, 1993;<br>Pearm, Roderick & Mulrooney, 1995<br>Arygyris, 1978; 1990 | Individual self-actualization.<br>Measurement of learning through evaluation and quality management systems.<br>Enabling structures<br>Management of culture  | Competitive advantage   | Does not consider how individual learning transfers into organizational learning<br>Little empirical evidence to support ideas  |
| Organizational learning is not necessarily a source of competitive advantage                              | Brown & Duguid,; Dodgson, 1993<br>1991; Huysman, 1995; March, 1990   | Learning happens subconsciously and is embedded in day-to-day work activity.<br>Managers have cognitive limitations which prevent them from moving into new and different territories or engaging in exploratory learning | Organizations frequently under-perform and fail to recognize new and different opportunities. | Provides little guidance to practitioners seeking to enhance organizational learning.   |
| Routines and procedures underpin learning at organizational level   | Nelson & Winter, 1982; Cummings & Worley, 1997;<br>Weick & Roberts, 1993   | Organizations apply learning through establishing routines and procedures to provide focus for organizational activity  | The efficient conduct of organizational activity.<br>Lack of flexibility                      | Little discussion of how existing routines can be changed to accommodate new ideas.   |
| Organizational learning involves the creation and dissemination of 'knowledge'                            | Argote, Ingram, Levine & Moreland, 2000;<br>Nahapiet & Ghoshal, 1998;<br>Nonaka, 1994, Schulz, 2001                            | Learning takes place as organizations establish channels to enable both the creation and the exchange of 'knowledge'  | Improvements in productivity<br>Capacity to manage change.<br>Innovation                      | Little focus on how to manage individual creativity.<br>Little discussion of how 'knowledge' is applied.  |
| Organizational learning involves inter-action between individuals, work groups and the wider organization | Kim, 1991; Dixon, 1994; Crossnan, Lane & White, 1999   | Organizational learning happens as individuals learn, share their learning with their work-groups and the organization establishes procedures to apply learning.  | Capacity to manage change<br>Innovation   | Difficult to separate the stages involved as learning moves from individual to organizational level.<br>Little consideration given to measuring learning- more concern with the outcomes it produces. |

The above table shows that conflicting ideas surround fundamental issues: the extent to which learning in organizations is a source of competitive advantage (Dodgson, 1993; Huysman, 1995; March, 1991) how and to what extent it is possible to intervene to enhance performance (Brown & Duguid, 1991; Lave & Wenger, 1991; March, 1990) whether the organization itself shapes the nature of learning activity (Nelson & Winter, 1982; Weick & Roberts, 1993) whether and how individuals can transfer their insights into the organizational domain (Crossnan, Lane & White, 1999; Kim, 1991; Dixon, 1994; Nonaka & Takeuchi, 1995).

Other conceptualizations take the view that organizational learning is concerned with the way in which knowledge is managed (Argote, Ingram, Levine & Moreland, 2000; Huber 1991; Nahapiet & Ghoshal, 1998; Nonaka, 1994, Nonaka & Takeuchi, 1995, Schulz, 2001). Knowledge is not always defined, but Nonaka and Takeuchi's (1995) depiction of knowledge as 'interpreted information' makes sense, because it suggests that knowledge is acquired through people actively deciding what information is or is not relevant. According to this perspective, organizational learning involves the assimilation and exchange of knowledge (Nahapiet & Ghoshal, 1998). Where knowledge is effectively managed, outcomes may be 'remarkable increases in performance' (Argote et.al., 2000) or 'continuous innovation' (Nonaka & Takeuchi, 1995). Starkey (1996, p. 3) suggests that 'learning...is the key to management innovation', whilst Tushman and Nadler (1996, p. 136) argue that 'the most innovative organizations are highly effective learning systems.'

Other models of organizational learning propose that learning happens as individuals make sense of information, relate their renewed understanding to what they

already know and believe, and shape the thinking of others through effective communication (Kim, 1991; Dixon, 1994). Crossnan et.al.'s (1999) organizational learning framework proposes that such models provide only limited insight into the relationship between individual creativity and organizational renewal because they do not consider the channels by which individual and team learning impacts upon organizational behaviour. They put forward a four-stage model that looks at the role of the individual, group and wider organization in shaping both the creation and enactment of knowledge. Individuals gain new knowledge through 'intuiting', establish what the new knowledge means through 'interpreting' and share their knowledge with others through 'integrating'. New organizational knowledge is enacted through 'institutionalizing' as organizational members collectively develop routines and procedures to shape the behaviour of others. There is a dynamic relationship between 'institutionalizing' and the first stage of the cycle, 'intuiting.' Crossnan et.al. propose that such activity results in 'strategic renewal.'

This definition captures the interaction between individual, team and organizational activity – arguably, necessary if behavioural change at organizational level is to be effected as a result of learning. Following Crossnan et.al., I argue that organizational learning happens as knowledge is created and enacted, in the ways outlined above. There is a relationship between cognition and action, at individual, team and organizational level. As a general proposition, organizations and their members are more likely to be willing and able to embrace change, or achieve strategic renewal, where individuals are engaged in the assimilation and exchange of knowledge. However, measuring change and peoples' responses to it is problematic (Pettigrew and Whipp, 1991). In addition, not all change is the result of creative endeavours (for example, a

redundancy operation constitutes change). It seems reasonable to propose, however, that there will be a positive relationship between the application of this framework and innovation, especially given the similarity between Crossnan et.al.'s proposals and many stage models of innovation (Rogers, 1983; Zaltman, Duncan & Holbek, 1973). I thus argue that the extent to which an organization learns effectively can be gauged in relation to its capacity to engage in sustained innovation.

#### The theoretical rationale for enhancing organizational learning

There are a number of reasons why it is important to direct resources towards improving the quality and scope of organizational learning, particularly where it is believed that doing so will result in the more effective enactment of innovation. Kogut and Zander (1996) propose that one of the primary purposes of organizational endeavour is to improve upon its capacity to manage and create knowledge, and that firms have significant advantages over other institutional arrangements, such as markets, in this regard. In a similar way, the resource-based view of the firm (Barney, 1991), asserts that the internal resources of a company are a key variable impacting on its effectiveness, in particular, the "training, experience, judgment, intelligence, relationships and insights of individual employees", and secondly, the company's reporting structure and its planning processes, in addition to any formal or informal arrangements leading to effective interaction between individuals and with the external environment. This perspective is also in line with theories of social capital, which hold that networks of relationships constitute a valuable resource for the conduct of social affairs (Bourdieu, 1986). Through their relationships with others, people can gain access to information and opportunities

and can also develop mutually beneficial sets of obligations, to do with, for example, the sharing of knowledge.

Tacit knowledge has received particular attention from theorists in recent years (Nonaka & Takeuchi, 1995; Prahalad & Hamel, 1990; Spender, 1996) since it is seen to represent a particular source of advantage implicit in the structural, cultural and communication arrangements of organizations. Tacit, as opposed to explicit, knowledge, is embedded in the subconscious; it is a form of 'automatic knowledge' (Spender, 1996). As Lam (2000, p.489) puts it, "a large part of human knowledge, such as skills, techniques and know-how. ...cannot be easily articulated or communicated in codified forms". Similarly, Nonaka (1995, p59) describes tacit knowledge as that which is "personal, context-specific and therefore hard to formalize and communicate." The implication is that tacit knowledge is of greater value than explicit, codified knowledge. This is particularly the case where such knowledge informs ways of thinking and behaving at a collective level, generating the 'heedful understanding' outlined by Weick and Roberts, (1993) in their analysis of flight deck operations. Several aspects of social capital play a role in generating the development of collective, tacit knowledge, including trust, which may open up access to people for the exchange of intellectual capital (Mishra, 1996) and social norms of openness and teamwork (Starbuck, 1992). Nahapiet and Ghoshal (1998) also allude to the importance of developing obligations and expectations in shaping the knowledge management agenda: people are more likely to engage in sharing and collaborative behaviours where they see that they may gain some advantage from doing so, and also where they strongly identify with either another person or a group of people. It is difficult to replicate this scenario; thus authorities argue that

developing practices to facilitate the assimilation and exchange of knowledge represents a substantial source of competitive success.

It is nonetheless difficult to communicate tacit knowledge to others, particularly where day-to-day experiences differ substantially. This leads to difficulties of knowledge 'stickiness' (Brown & Duguid, 1991; Szulanski, 2000) and also of achieving stability. Lam (2000) highlights the knowledge retention problems which are symptomatic of organizations whose members manifest tacit skills of a high order, to the possible detriment of long-term survival and advancement. One of the key challenges facing organizations, therefore, concerns how to draw upon the tacit knowledge of individuals and teams, so that best practice in one part of the organization can be transferred elsewhere.

In summary, significant value is attached to firms' knowledge management capabilities, and to their capacity to develop a climate that encourages the sharing and articulation of knowledge. Organizations best placed to manage the tension between stability and innovation are those which have developed mechanisms for transferring tacit knowledge to others, and for using explicit, codified knowledge as a basis for the learning of individuals who are seeking to operate in new roles (Nonaka, 1994; Nonaka & Takeuchi, 1995). Both the knowledge and the resource-based perspectives and theories of social capital provide significant support for those wishing to persuade others of the importance of engaging in people management activity. Organizations that have the capability to learn and to respond effectively to challenges presented by the external environment are more likely to be able to survive over the course of time than those that do not possess such capability.

### Organizational learning and people management practices

The debate so far suggests that organizational learning is a process involving the creation and enactment of knowledge, resulting in innovation. Following Crossnan et.al. (1999), I propose that four stages are involved – intuiting, interpreting, integrating and institutionalizing. In reviewing any relevant empirical evidence, I make particular reference to the potential role of people management mechanisms in facilitating each stage of the process.

#### Intuiting/ interpreting

Intuiting involves making associations, considering new ideas and being open to the possibilities for growth and learning implicit in new experiences. It requires the re-shaping of cognitive maps; individuals draw their own meanings from situations and experiences according to the importance attached to particular stimuli and according to the knowledge that they already hold (Kolb, 1985). Both intuiting and interpreting are individual activities, and, whilst they are conceptually distinct, in practice they tend to be closely linked processes, since a creative idea is only likely to take root where it is linked to existing patterns of thought (Simon, 1991). There is, furthermore, a close relationship between the creative endeavours of individuals and the support provided for such activity by the immediate work group.

A wide literature exists which looks at how to increase the probability of individuals being able to exhibit such creative behaviours. For example, Hackman and Oldham's (1976) Job Characteristics Model identifies skill variety, task identity, task significance, autonomy and feedback as 'core dimensions' that affect employee satisfaction, motivation, absence, turnover and capacity to engage in creative behaviours.

Similarly, the socio-technical systems approach (Cherns, 1976) proposes that where work-groups have the opportunity to exercise control over tasks, they are more likely to exhibit creative responses to problems than would be the case when they are not in a position to exercise such control. Frese and Zapf (1993) argue that people who have control can do better because they can choose adequate strategies to deal with the situation; they can plan ahead better, they are more flexible when things go wrong. Both autonomy and variety in tasks are relevant because they facilitate the process of exposing individuals to new experiences and perspectives.

There is significant empirical support for these arguments. Shalley, Gilson and Blum (2000) demonstrated that jobs high on required creativity were also seen by the employees carrying them out as relatively high on complexity, autonomy and demanding work and relatively low on organizational controls. Amabile, Conti, Lazenby and Herron (1996) showed how five factors were positively associated with highly creative projects: the encouragement of creativity (by the organization, the immediate supervisor and the surrounding work group), autonomy or freedom, resources, pressures (including challenging work and workload pressure and (the lack of) organizational impediments to creativity (such as internal strife and rigid, formal structures). A positive, significant relationship was found between autonomy and the number of new ideas employees submitted to a suggestion programme (Hatcher, Ross & Collins, 1989). Oldham and Cummings (1996) showed that where organization climate is perceived to offer job complexity, non-controlling supervision and stimulating co-workers, creative outcomes – measured in this instance by assessing the number of patent disclosures, supervisor ratings of creativity and suggestion scheme proposals- are likely to ensue.

At the level of the organization, research demonstrates that where individuals and the units within which they work are exposed to a variety of experiences, they are more likely to generate creative outcomes. For example Tsai (2001) showed that a business unit's capacity to produce innovation was related to the extent to which it had contact with other business units, to the 'centrality of its network position.' Performance and innovation were measured by looking at the number of innovations produced and the profitability incurred as a result. Network position was assessed by asking different business units who they tended to interact with on a regular basis. According to this argument, a central network position impacts positively on performance because of the way in which it provides a variety of new perspectives for the recipient, together with opportunities for shared learning, knowledge transfer and information exchange. In a similar way, McGrath (2001), studying 56 exploratory projects, showed that such endeavours were more effective in situations where individuals were managed in a way that allowed them to be relatively autonomous than where they were closely supervised. The study drew upon managers perceptions, firstly, of the degree of exploration associated with each learning project, secondly, of the success of each project and, thirdly, of the degree of autonomy permitted. This argument suggests that autonomy itself tends to expose individuals to a variety of options, thus making it more likely that they will be able to choose the course of action that is most appropriate for the particular situation. Cohen and Levinthal (1990), in a study of 1000 organizations, showed that 'absorptive capacity' was developed as a result of individuals' gaining diverse perspectives from the external environment and challenging the thinking of others through the effective communication of such perspectives. They argue that 'it is

probably best to expose a fairly broad range of prospective receptors to the environment ' (p.132).

Such ideas have profound implications for those concerned with the people management aspects of organizational learning. People management practitioners need to consider how they can create 'internal variety', state whereby individuals have the cognitive flexibility to consider new and different possibilities. One important way of doing so is to design jobs so that individuals have relative autonomy in terms how to achieve goals, thus selecting from a variety of alternatives those which appear to be most appropriate in a particular situation. Internal variety is also generated as individuals are exposed to new knowledge from other parts of the organization. Tsai (2001) notes that innovation is more likely in situations where there is interaction between differing interpretations of knowledge. Therefore, to enhance organizational learning, those concerned with people management need to consider ways in which information and knowledge could be deliberately distributed. Possible strategies may be to move individuals fairly regularly to different parts of the organization, perhaps through the use of secondments, job rotation, short-term project work. This is a particularly valuable course of action given the difficulty of transferring tacit knowledge (Brown & Duguid, 1991). In addition, organizations need to explore ways of facilitating the interaction that individuals have with the external environment. Through exposing individuals to the challenges faced by customers or suppliers, for example, it may be possible to accelerate learning and to develop significant new knowledge which may result in future innovation. Formal learning opportunities away from the work environment – for example, studying for a degree or professional qualification- may also create internal

variety through exposing protagonists to new and different paradigms. Doing so should help prevent both employee and management exhibiting limited, short-term thinking (Levinthal & March, 1993). The challenge for HR professionals lies in creating mechanisms whereby employees can experience variety from a number of different sources.

### Integrating

Integrating involves developing shared understanding between individuals and work groups. Dialogue is critical at this point. Dixon (1994) describes dialogue as the process of constructing and deconstructing meaning in a dynamic way that adds to the knowledge base of the organization. Kim (1993, p. 13) argues that as a result of dialogue 'the organization's capacity for effective co-ordinated action increases.' Much dialogue takes place within the context of work activity. Brown and Duguid (1991), as a result of their ethnographic studies, conclude that much learning- including integrating- is an unconscious activity that happens as tacit skills are exchanged. Some take the view that the situated nature of learning means that 'learning eludes any form of engineering and planning. Learning happens, often above and beyond the intentions of actors' (Gherardi, Nicolini & Odella, 1998, p.294).

If dialogue lies at the heart of this stage of organizational learning, it does not seem unreasonable to propose that there may be ways of improving upon the way in which individuals engage with others. A number of studies have shown how work group members who establish a constructive dialogue with one another achieve a range of superior performance outcomes. Weick and Roberts (1993) study of effective performance on flight decks suggests that 'group mind' is developed through individuals being able to

manifest 'deftness' and 'comprehension'. Deftness represents a joint activity in which people know what action a situation requires and can anticipate what parts of that action can be done by others. Comprehension relates to the extent to which group members believe that within their group exists the knowledge to find a valid solution to a problem. The proposal is that these attributes can be developed, given that the right selection decisions have been made, and that induction and training play a key role in shaping the propensity of a group to perform at a high level.

Other studies have considered the relationship between group skills and performance outcomes. For example, a study by Carter and West (1998) looking at TV teams, considered the impact of team reflexivity on audience appreciation data and production manager ratings. Team reflexivity is a process whereby teams consider their internal and external environments and change how they operate to be effective. It is measured by asking sixteen questions designed to assess a range of factors, such as the extent to which team objectives are reviewed and the willingness of teams to adapt goals to deal with changing circumstances (see West, 2000). Both task reflexivity- how the team assessed its goals and reflected upon its effectiveness- and social reflexivity- the extent to which group members provide support for one another and deal with conflicts- were explored in this study. The study concluded that there was a significant relationship between team reflexivity and performance outcomes. The implication is that teams can better integrate diverse perspectives to develop shared meaning where members have the skills to engage in effective collaborative behaviours. At the level of the organization, Zietsma, Winn, Branzei and Vertinsky (2002) showed how collaborative dialogue

between various interest groups, including environmentalists, resulted in the development of an innovative approach to forestry by a large Canadian logging company.

Other work has proposed that individuals are more willing to engage in collaborative dialogue where they take the view that their learning is supported by the organization. For example, Lackteenmaki, Toivonen and Mattila (2001) propose that where individuals have a positive attitude towards learning and are willing to take initiatives, and where they are committed to the goals and strategies of the organization, they will be more willing to consider alternative points of view and to support change. This idea was tested empirically by measuring the attitudes towards learning and change exhibited by 150 employees of one case organization. Similarly, Chaston and Badger (2001) propose that there is a relationship between entrepreneurial activity and 'higher order' learning. Their study of 180 small companies measured entrepreneurial activity using a tool devised by Covin and Slevin (1988) and asked respondents to comment on a series of statements concerned with various aspects of the learning environment to arrive at a score for 'higher order' learning. Their findings showed that firms in the study defined as entrepreneurial scored higher in terms of perceptions of the learning environment than their non-entrepreneurial counterparts.

To what extent can people management practices make a difference to this stage of the organizational learning process? Research suggests that it is possible to develop skills that facilitate collaborative dialogue (Kim, 1991; Dixon, 1994). Detailed discussion of the role of specific HR practices in developing skills is made in the following chapter. However, in general terms, it is reasonable to assert that people management practices can play an important role in the development of such skills. The appraisal process

represents an opportunity to set goals for individual behaviour and to provide feedback on performance to date, and support the development of communication and team-working skills. Induction activities shape the psychological contract (Herriot & Pemberton, 1995), clarifying what is seen to represent good performance and encouraging the development of questioning, sharing and collaborative behaviours. Research shows that learning and training have a general, positive effect upon peoples' willingness to engage in constructive dialogue. There are two possible explanations for this. The first is that where individuals believe that organizations invest in their development, they are willing to be proactive in looking at ways in which any new knowledge acquired could be applied, in order to ensure that they are fulfilling their side of the psychological contract. The second possibility is that through participating in developmental activities, individuals become increasingly confident, feel more able to articulate their opinions and are less threatened when they are presented with the alternative views of other people. These are thus strong arguments in favour of adopting a clear developmental strategy across the whole organization, supported by performance management and reward systems, with a particular focus on the enhancement of communication and team-working skills. These arguments are considered in more depth in the next chapter.

### Institutionalizing

Institutionalizing involves codifying the knowledge acquired as a result of intuiting, interpreting and integrating in order to effect change across the whole organization. Where learning is embedded in systems, structures, strategy, routines and prescribed practices, it guides the actions and learning of organizational members

(Crossnan et.al. 1999). At the heart of Nonaka and Takeuchi's (1995) spiral of knowledge creation is the notion that effective organizational learning and improved performance happens as tacit knowledge is codified and made explicit. There is research evidence to show that substantial improvements in performance may arise through organizations' making efforts to codify learning and to articulate the unconscious thinking which informs practice (Argote & Epple, 1990; Cummings & Worley 1997; Epple, Argote & Devadas, 1993; Fiol & Lyles, 1985). The learning curve literature, for example, establishes empirically that, like individuals, organizations learn at different rates and that problems can occur which are detrimental to learning capacity. Some organizations exhibit rapid productivity gains when introducing a new product, whilst other demonstrate little or no learning. Productivity is determined by the extent to which organizations are able to articulate what behaviour is required for effective performance through developing training to inform practice and being clear about what work procedures constitute good practice. Argote and Epple (1990), for example, compared learning performance across different shifts when the same product was being produced. They measured effectiveness in a variety of ways, for example, in terms of productivity, accident rates and quality. They proposed that variations in organizational learning curves were attributable to a range of factors: organizational forgetting- measured empirically by looking at falls in productivity occurring when work resumed after a period of inactivity, employee turnover and the effectiveness of the transfer of knowledge within and across organizations. In a similar way, Adler and Cole (1992) measured productivity, absenteeism and employee satisfaction at manufacturing plants. Their study looked at the results of adopting very different organizational mechanisms for managing

performance in two plants manufacturing the same product. One plant closely specified work procedures and prescribed work activity. The other adopted a more 'human centred' approach with longer work cycles and more empowerment of individual workers. Measures of organizational performance were higher in the plant where work performance was closely controlled and where the workforce had few opportunities to use their initiative, in line with 'lean production' ideology. Adler and Cole's conclusion is that this way of operating 'represents the more effective model for encouraging organizational learning', and provides some evidence to support the idea that codifying knowledge has a positive impact upon organizational performance.

This work shows that learning can be accelerated or diminished by the adoption of organizational technology that is appropriate at a particular point in time. Some researchers propose that organizational technology or too great a focus on institutionalization can impede learning and prevent organizations from developing new knowledge. This happens as organizations perform increasingly well at an activity, so that members receive rewards for their success, thus increasing their willingness to perform the activity, thus increasing competence (Argyris & Schon, 1978). This represents a concern with exploitation- performing better at what the organization already does- than exploration – seeking to move into new areas (March 1991).

There is some empirical support for this idea. Tushman and Anderson (1986) showed how organizational technology prevented firms from being able to innovate in order to adapt to new competitive conditions. Henderson (1991), for example, investigated a firm manufacturing a new product. Quality problems experienced by users of the products were attributed to user error, because this had been the most common

cause of problems in products manufactured previously. This meant that the technical limitations of the product were not picked up until market share had declined precipitously. Hence, on this occasion, procedures developed for dealing with customer complaints inhibited effective performance and led to damaging results for the company.

Some researchers (Crossnan, Lane, White & Djurfeldt, 1995; Hedberg, 1981) take the view that 'unlearning' is required before new knowledge can be applied. Unlearning represents the process whereby old knowledge is discarded, making way for new responses and mental maps. It is potentially a problematic process, requiring time and resources, particularly when new knowledge is being acquired and enacted at the same time. Hedberg (1981) notes that sometimes the tensions involved in carrying out both unlearning and learning can result in poor performance, leading to the irreversible undermining of an organization's customer base. Providing an explanation about why organizations are different in terms of their capacity to unlearn and to practice exploratory learning, Nevis, DiBella and Gould (1995) showed that organizations have different 'learning orientations'. Drawing upon case study research conducted within manufacturing and financial services sectors, they identified seven 'learning orientations'. For example, they showed that organizations are different in terms of the way in which they acquire knowledge from the external environment, as opposed to internally, in terms of the extent to which new knowledge is documented, or resides in particular individuals, and in terms of the extent to which double as opposed to single loop learning is practiced by organizational members (Argyris & Schon, 1978). Nevis et.al. also proposed that it is possible to make fundamental shifts in an organization's learning orientation once the preferred style has been identified.

There is little research available to demonstrate the ways in which people management practices are likely to impact on the institutionalization stage of the organizational learning process. Nonetheless, it is possible to theorize that performance management, reward, training and induction activities may well influence the extent to which knowledge is codified and whether or not people work in line with specified routines and procedures. Induction and training activities identify where developmental needs should be addressed and provide appropriate support for individuals to ensure that the required behaviours are enacted. Reward systems ensure that appropriate financial recognition is made available to individuals who achieve their goals.

Performance management strategies can also impact upon the extent to which such routines and procedures can be dispensed with when they are no longer appropriate. As Nevis et.al. (1995) indicated, organizations can change their learning orientations once they have recognized the limitations of the particular approach that they are adopting. For example, Nevis et.al. (p. 7) suggested that organizations need to ask whether learning is concentrated on 'methods and tools to improve what is already being done or on testing the assumptions underlying what is being done.' Therefore, employees need to be encouraged to question and challenge existing ways of operating to ensure that 'unlearning' happens and that the organizational technology employed continues to be appropriate in the light of changing external circumstances. Proposals made when focusing on the 'intuiting' stage of the cycle are also relevant here.

### People management and organizational performance.

This chapter has considered the potential role of people management practices at each stage of the organizational learning cycle. Whilst this is an under-researched area, it is fairly clear that the relationship will not necessarily be positive. Organizations vary both in the importance that they attach to people management and in the type of practices that they instigate. It is possible to envisage that some practices may be detrimental to both learning and innovation, particularly where the intention is to control rather than to empower. Nonetheless, I have attempted to show that 'learning organization' status can be achieved where there is awareness of the main stages involved in managing learning at organizational level, and where appropriate people management practices are implemented to support each stage.

. Whilst few researchers have considered the people management/ organizational learning relationships, a number have shown that there is a direct relationship between people management practices and other measures of organizational performance. Ulrich (1999, p.319), for example, states that 'HR practices create organizational capabilities that lead to competitiveness. HR champions master, align and leverage these practices so that employees, customers and investors receive value.' This is to some extent borne out by a number of recent research studies (Delery & Doty, 1996; Dyer & Reeves, 1995; Huselid, 1995; Huselid, Jackson & Schuler, 1997; Koch & McGrath, 1996; Patterson & West, 1998). Such studies broadly indicate that such an association exists where there is evidence of the employment of so-called 'high commitment' practices, and where there is apparent strategic integration between personnel policies and practices and overall business strategy (Storey, 2001). The theoretical framework for such studies is in line

with the resource-based view of the firm and ideas to do with the value of social capital, as discussed in the first section. By what mechanisms are such practices likely to have an impact on firm performance? Huselid (1995) proposes that they do so in two ways, firstly, by developing skills and, secondly, by enhancing levels of motivation. I have already explored ways in which people management practices can play an important role in developing the skills required to facilitate organizational learning and innovation. However, the effectiveness of even highly skilled employees will be limited if they are not motivated. Bailey (1993) points out that human resources are frequently 'underutilized' because employees often perform below their maximum potential and that organizational efforts to elicit discretionary effort from employees are likely to provide returns in excess of any relevant costs. This is in line with Hackman and Oldham's (1976) Job Characteristics Model. As discussed earlier, the model identifies skill variety, task identity, task significance, autonomy and feedback as 'core dimensions' that affect employee satisfaction, motivation, absence, turnover and capacity to engage in creative behaviours. Hackman and Oldham further propose that that such a model will influence performance outcomes only where employees are motivated to invest the necessary time and effort in making the most of opportunities presented to them in this way.

What HR practices are likely to impact upon levels of motivation? Performance and career management practices can increase motivation by providing a clearer focus for individual and group activity and setting challenging goals. Internal promotion systems that identify merit can also have this effect. In addition, job design practices are likely to influence motivation through creating a sense of empowerment and control, enabling individuals to perceive that they are making an important contribute to the achievement

of organizational goals. Similar effects are likely to be engendered through employees being offered opportunities to participate in decision-making through being members of project teams or quality circles. Huselid (1995) showed that where such practices existed, turnover was lower and productivity higher than where this was not the case. There was also a positive relationship between the existence of such practices and overall financial success.

The HR practices detailed above are likely to be effective to the extent that they are applied strategically. Two aspects of HR strategy formulation are critical in determining effectiveness: firstly, the extent to which strategy is endorsed by the top management team (Sparrow & Marchington, 1998; Storey, 2001; Tyson, 1997) and secondly, the degree of planning manifested in its enactment (Bramham, 1996; Koch & McGrath, 2001). Both support by senior management and human resource planning enhance the probability of HR practices achieving the desired result, i.e. the creation of an environment whereby individuals are motivated to apply the learning acquired in some of the ways detailed above. Noe, Hollenbeck, Gerhart & Wright (1994), for example, stated that human resource planning 'creates the kind of lead time necessary to ward off potential problems that might otherwise threaten the company's position.' Companies are likely to succeed in employing people with the underlying qualities required to facilitate learning and innovation to the extent that they plan for future recruiting requirements. There is substantial research available to the effect that such a strategic approach to the employment and deployment of people is likely to be effective where people management specialists are employed at senior levels within the organization, thus

ensuring that people management issues are actively considered and appropriately resourced.

### Conclusion

My proposal is that, as a general rule, practices designed to facilitate the experience of internal variety will be required in the intuiting and interpreting stages of the organizational learning process, whilst practices designed to develop skills will enable organizations to integrate and institutionalize knowledge acquired in the earlier stages. People management practices may play a role in enabling each stage of the organizational learning process to unfold. They may have a more general effect on organizational well being because such practices provide strategic focus for the direction of behaviour, and have the potential to shape levels of motivation (Huselid, 1995; Huselid, Jackson & Schuler, 1997). The 'learning organization' vision may be achievable where each stage of the organizational learning process is addressed. This suggests that efforts should be made to enhance individual learning, but equally importantly, to capture such individual-level learning, to share learning with the wider community in the workplace and to develop mechanisms for its application.

There are a number of difficulties in making this assertion with any degree of certitude. Firstly, there is a lack of clarity about what organizational learning is, and the extent to which it is possible to manage the process, as discussed in the first section. This problem is compounded by the paucity of empirical research that has been conducted in the area (Cohen & Sproull, 1999; Easterby-Smith, 1999; Miner & Mezias, 1996,). Secondly, within the empirical studies that do exist, different outcomes are being measured. The creativity literature explores the extent to which facets of organizational

climate impact upon idea generation and motivation. The organizational learning literature proposes that effectiveness can be measured by analyzing employees' attitudes towards change (Lackteenmaki et.al, 2001), their perceptions of the success of projects (McGrath, 2001), productivity (Adler & Cole, 1995; Epple & Argote, 1999), audience appreciation (Carter & West, 1998) or innovation (Chaston & Badger, 2001; Tsai, 2001,). Thirdly, different aspects of organizational activity are being measured in order to establish what leads to particular outcomes. For example, Lackteenmaki et.al. (2001) and Chaston and Badger argue that positive outcomes are achieved where employees perceive that their learning needs are being addressed. Others argue that the way in which knowledge is transferred is the key determinant (Szulanski, 1996; Schulz, 2000; Tsai, 2000). Another school of thought argues that reflexive practices determine whether or not teams learn effectively. The 'situated learning' approach (Brown & Duguid, 1991; Lave & Wenger, 1991) holds that attempts by management to codify work activities through the use of job descriptions or training activities are unlikely to enhance performance unless they take into account the community of practice in which individuals operate, and argues in favour of empowerment and support for naturally emerging solutions to problems identified by the work group.

For these reasons, more empirical research is urgently needed to demonstrate the relationship between people management practices, organizational learning and innovation. A number of points require further clarification. Firstly, in what circumstances are organizations likely to adopt some of the people management practices that the learning organization literature proposes will make a difference to the performance and capability of the organization? Secondly, to what extent is there

evidence that practices designed to enhance variety and to develop skills will result in the learning required to produce innovation? Is it likely that such an effect is more pronounced where both sets of practices are used in conjunction with one another and where a strategic people management focus is employed? Finally, is there evidence to show that motivation is positively related to learning and innovation?

The next section makes reference to the model that is used to guide the conceptual framework for the following studies. Bearing in mind the difficulties inherent in cross-sectional research designs, the model takes a longitudinal approach that seeks to clarify what internal and external contextual factors are likely to result in the adoption of organizational learning mechanisms. It then considers whether such mechanisms influence outcomes, arguing that the desirable outcome would be innovation, and that both learning mechanisms and HRM practices will significantly impact upon innovation because they engender organizational learning. The model also considers the relationship between job satisfaction and innovation. A number of studies are then presented to demonstrate the applicability of the model in practice.

## CHAPTER 2

### A model of organizational learning

#### Introduction

To what extent do people management practices enhance organizational learning? There is an empirical and theoretical basis, presented in chapter 1, for arguing that people management will have a positive effect upon each stage of the organizational learning process. Furthermore, research reviewed in chapter 1 reveals significant and positive relationships between people management and a range of performance outcomes, such as productivity and profitability.

This chapter introduces the model used to guide the empirical research presented in the thesis. Firstly, because not all organizations adopt mechanisms intended to facilitate higher order learning, the model explores the extent to which variables in the internal and external context are significant. Drawing upon theories asserting the importance of growth and development over time, I argue that organizations are only likely to engage in and be committed to higher - order learning where contextual constraints such as structure make this possible.

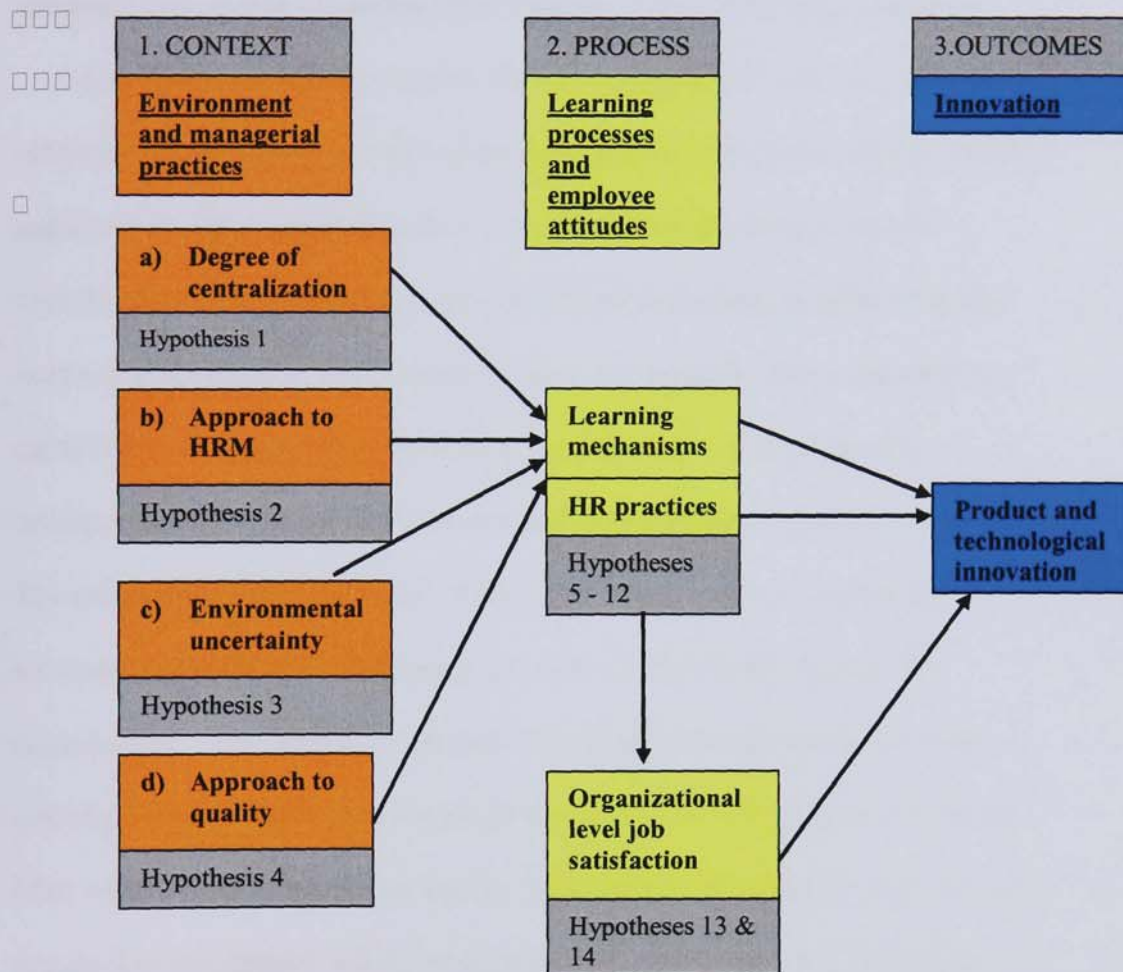
The model goes on to look in detail at the learning mechanisms and HR practices intended to facilitate organizational learning. Drawing upon the literature review presented in the last chapter, the model asserts that people management provides direction and support for learning in two main ways. Firstly, effective people management presents opportunities for individuals to experience variety. I argued in chapter 1 that exposure to new and different experiences not only enhances individual creativity, but also makes individuals

more receptive to ideas put forward by others. Secondly, I propose that effective people management develops individuals' skills and motivation to share their knowledge with others. This makes it possible for organizations to integrate and institutionalize knowledge, thereby completing the organizational learning cycle.

I then consider the extent to which job satisfaction at organizational level facilitates learning and innovation. The rationale for this argument is expressed in detail later in this chapter, but the argument in essence is that positive affect enhances cognitive flexibility and creativity. I also argue at this point that an environment conducive to learning and creativity plays an important part in generating job satisfaction. Learning mechanisms and HR practices thus enhance organizational learning in two ways. Firstly, they augment individual knowledge and organizational learning capability. Secondly, they induce high levels of satisfaction in the workplace, thereby facilitating creative outcomes.

I conclude by examining the theoretical basis for the innovation/performance relationship. Whilst this relationship is not specifically addressed in the thesis, arguments presented in this section are central to its overall rationale.

# Model guiding the research



### Environment and managerial practices

The proposal is that organizations which have in place mechanisms designed to facilitate organizational learning exhibit a 'learning orientation.' Such an orientation represents a propensity to engage in effective organizational learning. This section considers what variables predict learning orientation.

As suggested in the first chapter the OL literature is diverse and open to influences from a variety of disciplinary perspectives. (Easterby-Smith, 1997). I argue that study of some of the key disciplines provides insight into the underlying variables shaping the organizational propensity to adopt effective learning mechanisms. Contingency theory, for example, draws attention in particular to the notion of environmental uncertainty. The production management perspective is concerned with notions such as quality orientation. The management science school of thought focuses on the importance of structure as a vehicle for enhancing the flow of information through the organization. The strategic management perspective draws attention to the notion of 'best fit' with the external environment. The HR perspective has not been widely considered within the OL literature. As discussed in chapter 1, the proposal in this chapter is that consideration of a range of issues relating to people – the way in which they are paid, consulted with, involved- is likely to be significant in predicting learning orientation. Furthermore, theories of the 'developmental' school of organizational learning suggest that 'learning proceeds in a series of inter-linked sequences that provide the necessary foundation for moving to each successive stage' (Bell, Whitworth & Lukas,

2002. p. 71). Thus, some organizations are in a stronger position than others to adopt a learning orientation. The extent that they are able to do so depends in part upon the factors detailed above. I propose that four variables – the degree of centralization exhibited, approach to HRM, environmental uncertainty and quality orientation – are important. The theoretical rationale for the selection of these factors is detailed below.

#### a) Degree of centralization

Many organizational theorists consider that organizational structure plays a key role in determining how effectively learning happens (Chandler, 1962; Hedberg, 1981). Researchers such as Mintzberg (1973), Quinn (1992) and Nonaka (1994) describe the types of decentralized organizational structures that they believe are most appropriate to deal with a turbulent environment and where there is a need for a high degree of innovation. Such structures are variously called adhocracies, clusters, networks, and satellites. These structures are essentially made up of task forces; they tend to be flatter than traditional structures and to emphasize the importance of empowerment, good customer relations and the development of knowledge and skills. There is generally a negative perception of centralized structures in these contexts; they are seen as inhibiting the development and application of new ideas and encouraging parochial thinking. The proposal is that organizations are unlikely to adopt the mechanisms designed to enhance variety in situations where the predominant thinking tends to favour centralization and hierarchical divisions.

Hypothesis 1: the degree of organizational centralization at one point in time

will negatively predict the subsequent existence of management practices designed to promote learning orientation.

#### b) Approach to HRM

Many of the arguments concerned with the contribution of HR practices to organizational performance were rehearsed in chapter 1. The essence of the argument is that there is a need for 'horizontal' integration across HR activities, leading to the diffusion of learning through the organization (Storey 1995, Marchington and Wilkinson 2000). HR activities such as performance management, training, reward and recruitment and selection will only enhance organizational effectiveness where they have been designed and implemented in a way, which is mutually supportive. For example, reward systems need to recognize the coaching and mentoring skills of managers, if there is a policy for making use of this particular type of employee development. Dyer and Reeves (1995) raise the issue of 'bundling', arguing that HR activities which occur in 'mutually reinforcing, synergistic sets' (or bundles) are more effective than individual components. Huselid, Jackson and Schuler (1997) distinguish between activities that they described as 'technical HRM effectiveness'—recruitment and selection, training, performance appraisal and compensation administration – and 'strategic HRM effectiveness' – i.e. developing employees to support business needs, teamwork, communications, involvement, enhancing quality and developing talent for the future. It is proposed that 'strategic HRM effectiveness' is a basic pre-condition for the development of learning mechanisms.

Hypothesis 2: The existence of effective HRM practices at one point in time will predict (positively) the subsequent existence of management practices designed to promote learning orientation.

c) Environmental uncertainty

There is a substantial theoretical rationale for there being a relationship between perceptions of environmental uncertainty and a willingness to develop practices likely to support learning activity. In situations of uncertainty-whether this relates to complexity, dynamism or both (Duncan, 1979), higher level skills will be demanded of employees. In addition, in such situations, it is important to develop diverse perspectives, which can be considered and adopted as circumstances arise. In order to generate such diverse perspectives, it is important to look at ways of enhancing variety in peoples' jobs. This can be achieved by employing some of the mechanisms alluded to in the previous section.

One of the limitations of the environmental alignment argument lies in the way it does not take account of internal factors shaping the propensity of the organization to respond to challenges presented by the external environment. This is particularly the case in relation to learning. As Dodgson (1993, p. 387) points out, 'organizational learning cannot be created and eradicated by varying external stimuli'. At most, uncertainty in the external environment can represent a trigger for change and a rationale for considering alternative ways of organizing. Whether or not the resulting change results in the establishment of effective learning depends on many other factors, such as HRM strategies,

organizational structure and emphasis on quality. Nonetheless, I propose a positive relationship between environmental uncertainty and the existence of learning mechanisms. In situations of uncertainty, contingency theorists such as Burns and Stalker (1961), Lawrence and Lorsch (1967) and Duncan (1979) argue that organizations will be more inclined to invest in training staff because higher skill levels will be demanded of employees. Furthermore, research at team level proposes that external pressure is a powerful driver for learning and innovation (Bunce & West, 1995; West, 1989).

Hypothesis 3: Environmental uncertainty at one point in time will positively predict the subsequent existence of managerial practices designed to promote learning orientation.

#### d) Quality management

Literature suggests that an ability to measure the impact of new managerial strategies is a critical determinant of the adoption of learning mechanisms (Adler and Cole, 1993). This idea is based on the notion that learning per se is difficult to measure, and that one therefore needs to consider outcomes such as productivity and efficiency when considering the usefulness of particular mechanisms employed. Garvin (1993) goes further and asserts that good measurement of learning processes and outcomes is likely to enhance the effectiveness of the learning taking place within organizations. Such measurement relates to the extent to which individuals achieve developmental targets, and the extent to which such achievement contributes to the advancement of organizational goals. He argues that the discipline imposed by

a quality regime such as TQM is likely to enhance significantly a business' potential to develop effective learning mechanisms. TQM requires a demonstrable commitment to the learning of individual members, learning which is focused on the needs of the business (Deming 1982; Feigenbaum 1983).

There are similarities between the strategic HRM and TQM (Oliver & Wilkinson 1992). Both are concerned with the development of people management skills (in order to foster an atmosphere where employees can be open about their insights and willing to share them with others) and both require a willingness to monitor progress and to make changes according to the needs of the business (Sitkin, Sutcliffe and Schroeder, 1994) Some scholars distinguish control from learning goals within quality systems (Sitkin, Sutcliffe and Schroeder, 1994) Nonetheless, I argue that organizations that are committed to quality enhancement are closer to becoming learning organizations than those manifesting no such commitment.

Hypothesis 4: The existence of extensive quality management practices at one point in time will positively predict the subsequent existence of managerial practices designed to promote learning orientation.

## 2. Learning processes and innovation.

This part of the review considers the second element of the model, and develops arguments expressed in chapter 1, to the effect that effective people management may enhance organizational learning. The first part of this section

considers the impact of mechanisms specifically designed to manage learning.

The section concludes by considering the role of HR practices in this respect.

### Learning mechanisms

Precisely what learning mechanisms promote OL through variety generation and skill development? Turning to employee development literatures, there is acknowledgment that the immediate work environment presents a powerful arena for learning. According to Stern and Sommerlad (1999) workplace learning happens in three main ways. Firstly, individuals learn through being party to planned interventions such as in-company management training programmes. Secondly, organizations can introduce planned interventions designed to support and structure the learning of individuals, such as job rotation, coaching, mentoring or work shadowing. Thirdly, learning is part of everyday work activity, therefore organizations need to recognize the close this close connection by providing support, both in relation to the task itself and the work environment (Eraut, Alderton, Cole and Senker, 1998).

What interventions are most likely to promote workplace learning? Ashton and Felstead (2001) suggest that four practices are particularly significant: job rotation, team-working, involvement of lower level employees and flattening of management structures. Watkins and Marsnick (1993) refer to the importance of new job assignments, participation in total quality groups or action learning sets, self-initiated or self-planned activities, career planning and performance evaluation and developing ways of combining less organized experiences with structured opportunities for learning. Similarly, Mumford (1997) asserts the

value of having plans for development, and considers ways in which jobs can yield more developmental opportunities. He refers to the potential value of regular visits to customers and suppliers, because such visits make employees more aware of diverse perspectives and thus encourage greater mental flexibility. Mumford also proposes that project work provides important opportunities for development, particularly if it can be used in conjunction with a process such as action learning, which encourages people to share their experiences with others and thus also assists in the transfer of knowledge. Pascale (1999) refers to the importance of job rotation at Ford, in particular, between line and staff functions. Similarly, at Honda, the thinking of designers is challenged through spending three months of the year attending car dealer conventions around the world. Another way of developing diverse perspectives in a manufacturing environment is to facilitate the involvement of shop floor workers. One of Ford's managers commented, for example that 'if you involve the hourly paid worker, he'll willingly contribute far more than management can imagine' (Pascale, 1999, p.165).

The value of implementing coaching and mentoring schemes is widely acknowledged in the literature (Reid & Barrington, 2002; Stern & Sommerlad, 1999). . Coaching is an activity in which 'a manager, through direct discussion and guided activity, helps a colleague to solve a problem or to do a task better than otherwise had been the case.' (Megginson and Boydell, 1979). Its purpose is to assist individuals or groups to approach specific problems, for example, making presentations. Mentoring, on the other hand, is a process whereby more

senior members provide support and guidance to others on general career development matters. Megginson and Clutterbuck (1995) argue that this relationship allows the exchange of tacit knowledge and develops an understanding of the political agenda in the workplace, and that for these reasons mentoring represents a powerful developmental tool, frequently for the mentor as well as the protégé. Zey (1984) discusses some of the techniques involved in this kind of learning: non-directive teaching that enhances independence, and self-confidence and learning by doing under supervision. Brown (1994) draws attention to the difficulties of operating effective coaching and/ or mentoring schemes, which lie in the way in which coaches and mentors frequently receive little recognition for the development of such skills.

Lank (2002) proposes a typology for capturing knowledge and facilitating its flow around the organization. She argues that ‘knowledge architects’ will consider what knowledge is important and how it could be shared, as well as which methods will be used to transfer knowledge from one part of the business to another. ‘Knowledge facilitators’ such as company journalists, webmasters and training and development professionals will ‘make the most visible contribution to day-to-day (knowledge management), whilst all employees have a responsibility to share expertise and knowledge and to participate in actions such as ‘lessons learnt’ reviews. O’Dell and Grayson (1998) argue that companies tend to attach too little value to the process of exchanging knowledge and best practice. Some of their ‘keys to effective knowledge transfer’ refer to the need to develop people management practices which

reward sharing and transfer. They also refer to the importance of developing leaders who can 'encourage collaboration across boundaries of structure, time and function by promulgating success stories, providing infrastructure and support and changing the reward structure to remove barriers' (p.173).

I argue that manufacturing organizations which implement and fully endorse the practices outlined above will be in a strong position to produce sustained product and technological innovation. Through undertaking job rotation, for example, individuals are exposed to new and different experiences; whilst coaching and mentoring support enables individuals to articulate the learning acquired. Mechanisms designed to promote the storage and sharing of knowledge make it possible to instigate good practice in different parts of the organization, thereby enhancing OL.

Hypothesis 5: where organizations employ all or the majority of the practices described above to manage learning, they will produce relatively high levels of product and technological innovation at a later point in time.

#### HR practices

Organizations which employ the practices outlined above bear many of the characteristics of 'learning organizations', as defined by Pedler, Burgoyne and Boydell (1999). The model depicted on page 55 suggests that a broad commitment to HR in other ways will have a similar effect. The following section considers this possibility.

In chapter 1 I argued that HR practices such as performance management, training and induction would perhaps impact upon the last two

stages of the organizational learning process because they tend to develop skills rather than expose people to new and different experiences. I consider below the type of skills that such practices may develop, and outline the possible mechanisms by which such practices facilitate the learning required to produce innovation.

What skills are needed to facilitate OL? According to many scholars of organizational learning, communication and team-working skills are important (Crossland, Lane & White, 1999; Dixon, 1994; Kim, 1991; Nonaka & Takeuchi, 1995). Research suggests that there is positive relationship between an environment where employees are encouraged to articulate their ideas to others and innovation (Amabile, 1988; Amabile, Conti, Coon, Lazenby & Herron, 1996). Furthermore, effective communicators will be able to draw upon the knowledge of individuals at different levels of the organizational hierarchy, thus making it possible to bring together diverse perspectives (Schulz, 2001). Empirical research, presented in chapter 1, shows that new ideas are more likely to be forthcoming given the frequent exposure of individuals to diverse opinions and experiences (e.g. Tsai, 2002).

An array of team-skills further facilitates the production of innovation (cf. West 2002). For example, individuals can learn to reconcile differences positively. This is helpful, because where conflict is used constructively, it is possible to draw upon a wider range of perspectives than would be the case otherwise, as detailed above. Furthermore, some individuals will be better placed than others to enhance team reflexivity. Reflexivity involves three

elements: reflection, planning and action or adaptation. Where individuals have the skills to work together to reflect, plan and take action, research suggests that team innovation and effectiveness is enhanced (Carter & West, 1998). Whilst the skills detailed above apply specifically to individuals, I suggest that they have an effect upon the performance of the immediate work group and the organization as a whole. These skills play a fundamental role in enabling the organization to capture creative ideas and to apply them. I will now consider the mechanisms by which such skills can be developed, making particular reference to three HR activities widely considered in the literature: appraisal, induction and training.

**Appraisal:** The proposal in this chapter is that appraisal has an important role to play in enabling individuals to acquire the skills detailed above. Appraisals take many different forms and there have been many criticisms of the process from academics and practitioners (Carlton & Sloman, 1992; Stiles, Gratton, Truss, Hope-Hailey & McGovern, 1997). Some argue that appraisal is a management control device, seeking to manipulate rather than empower (Grey, 1994; Newton & Findlay, 1996; Townley, 1993). Others propose that managers frequently lack the skills necessary to conduct effective appraisal (Bowles & Coates, 1993). There is nonetheless a robust empirical rationale for the relationship between appraisal and performance. Huselid (1995), for example, showed that where appraisal is used in combination with comprehensive recruitment and selection procedures, and extensive employee involvement and training organizations will perform better financially than those where no such practices are employed. West, Borrill, Dawson, Scully, Carter, Anelay, Patterson, & Waring, (2002) demonstrated a

significant relationship between the existence of performance appraisal practices for all groups of staff in hospitals and organizational outcomes, measured in this context by analyzing patient mortality rates.

What are the likely mechanisms whereby appraisal has this effect? Two points are significant. Firstly, through appraisal, individuals gain feedback, usually from their immediate supervisors, to indicate whether or not they are manifesting the behaviours required for success. Feedback provides information to individuals about the extent to which they are achieving identified standards, and in this way enhances individual performance (Locke & Latham, 1990). Furthermore, where goals are difficult, there is evidence to suggest that feedback interventions increase the motivation manifested by individuals to attain the standard specified (Erez, 1977). Amabile (1984) found that appropriate feedback was an important facilitator of creativity amongst research and development managers and West (1989) found social support from superiors to be a predictor of creativity amongst community nurses.

Other work suggests that feedback interventions are effective where individuals are clear about the goals that they are trying to achieve, where they are committed to meeting them and where belief in eventual success is high (Bandura & Cervone, 1983). It would appear, therefore, that appraisal is important as a process for formulating and reaching agreement around goals. Indeed, substantial research evidence suggests that goal-setting may be the most critical component of the appraisal process (Guzzo & Bondy, 1983, Guzzo et.al., 1985). Through appraisal it is possible to agree goals which are focused

upon the enhancement of team-working and communication skills. Effective feedback in the appraisal interview should provide information to individuals about the extent to which such goals are being achieved. Thus appraisal has the potential to play an important role in enabling individuals to work together constructively to integrate and institutionalize knowledge, thus producing innovation.

Hypothesis 6: Organizations that employ sophisticated appraisal practices will manifest relatively high levels of product and technological innovation at a later point in time.

To what extent is it helpful to link appraisal to remuneration? Theory states that performance related pay induces higher employee performance because it creates a meritocracy that rewards effort (Milkovich & Newman, 1996). The idea is that a wide spread between pay levels increases the returns for higher performance, thus creating a positive pay-performance link and inducing higher future performance (Milgram & Roberts, 1992). Some empirical support is found for this model. For example, research by Becker and Huselid (1992), in a study of auto racing, found that drivers performed better when there were substantial disparities between prize money offered.

At organizational level, theory again holds that organizational performance will be enhanced where individuals are striving to gain the maximum pay to which they are entitled, for the reasons detailed above. However, the limited research that has been conducted to address this point is not promising. Bloom (1999), investigating the impact of pay dispersion on

organizational performance within baseball teams, concluded that the relationship was negative. He hypothesized that this was because individuals who receive performance pay cease to be concerned about co-operating with others, but aimed to achieve the highest individual outcomes possible- a serious problem where success depends upon the effective interaction of teams. Another study by Bloom and Milkovich (1998) concluded that paying for performance was particularly unhelpful for organizations operating within a 'risky' environment. Such organizations performed worse in financial terms where they made use of 'at risk' pay than those which relied upon guaranteed basic earnings.

A number of implications arise from this brief review of the research. Firstly, pay systems need to be organized in a way which presents security to employees where there are perceptions that the external environment is highly turbulent- perhaps where organizations are seeking to achieve high levels of innovation. Furthermore, organizations seeking to enhance OL need to carefully consider how to ensure that individuals are encouraged to, rather than inhibited from, working with others collaboratively. These arguments suggest that linking remuneration to appraisal may be damaging. Where pay is tied to appraisal, individuals will be less inclined to work co-operatively with others, since such a pay system will inculcate the belief that earnings depend upon individual effort. In addition, the appraisal/ pay link may reinforce perceptions of uncertainty and turbulence. Individuals will probably find themselves unable to share concerns about their developmental needs because the expression of

any such concerns may have negative financial implications. However, such discussions need to happen where organizations are seeking to facilitate the learning required to produce innovation. I argue therefore that an appraisal process that is linked to remuneration will not help organizations to produce sustained innovation.

Hypothesis 7: organizations that link appraisal to pay at one point in time will produce relatively low levels of product and technological innovation at a later point.

**Induction:** There is little published research available considering the relationship between induction and organizational outcomes such as innovation. I argue, however, that the relationship will be positive, for a number of reasons. The purpose of induction is usually to clarify the expectations held by the organization and to shape employees' opinions about their role and potential contribution. Induction therefore forms the basis of the psychological contract (Herriot & Pemberton, 1995). It sets the scene for future developmental activity and should, where effectively conducted, lead new recruits to recognize the priorities attached to learning and innovation (Brown & Duguid, 1991). An induction process which is concerned with encouraging people to share and articulate knowledge, for example, would present individuals with opportunities for acquiring the communication and team-working skills outlined above. I therefore propose a positive relationship between induction and subsequent product and technological innovation.

Hypothesis 8: there will be a positive relationship between the existence of an effective induction process at one point in time and innovation at a later point.

**Training:** Motivation and skills can be further enhanced through the use of training and development practices. These potentially allow employees to acquire the necessary skills to support innovation, including effective team-working and communication skills and a willingness to be proactive and to challenge the status quo. The empirical support in favour of a positive association between training and organizational performance is strong. Empirical research has provided evidence of the link (Delaney & Huselid, 1996; Harel & Tzafrir, 1999; Lawler, Mohran & Ledford, 1995).

Theory, reviewed in chapter 1, suggests that training tends to increase an organization's propensity to perform well at an existing activity, rather than to enhance exploratory learning. Thus I argue that although training interventions will promote variety to some extent, they are more likely to have an effect upon OL by developing the skills necessary to integrate and institutionalize learning. Nonetheless, organizations which invest in training are likely to be in a stronger position to produce innovation than those which make no such investment, because training enhances 'absorptive capacity' (Cohen & Levinthal, 1990)- or employees' capacity to respond positively to new experiences and ideas. A number of studies have shown that organizational absorptive capacity is related to creativity and innovation (for example, Tsai, 2002).

Hypothesis 9: Organizations which employ sophisticated training practices will manifest relatively high levels of product and technological innovation.

Appraisal, induction and training are more likely to impact positively upon the last two stages of the organizational learning cycle when they are part of a strategic framework that recognizes the value and importance of developing people. This concept is supported by much of the HR literature, which holds that HR will predict performance where efforts are made to develop practices designed to support business strategy. The last chapter considered how two aspects of HR strategy formulation are critical in determining effectiveness. This will be the case firstly, where HR planning is endorsed by the top management team (Tyson 1997, Sparrow & Marchington, 1998, Storey 2001) and, secondly, where a strategic HR plan is adopted. (Bramham, 1996; Noe, Hollenbeck, Gerhart & Wright, 1994). Both support by senior management and planning enhance the probability of HR practices achieving the desired result, i.e. the development of the skills necessary to support innovation.

Hypothesis 10: Organizations that adopt a strategic approach to human resource planning are likely to produce relatively high levels of product and technological innovation.

Hypothesis 11: Organizations whose senior members endorse HR activity are likely to produce relatively high levels of product and technological innovation.

Finally, I argue that organizations that employ a combination of practices designed both to promote variety and to develop skills will produce higher levels of innovation than those will which focus upon one particular set

of practices. The theoretical premise and detailed hypotheses for this assertion are outlined in detail in chapter 6.

Hypothesis 12: a combination of people management practices will explain more of the variation between companies in technological innovation than those focused upon either variety enhancement or skill development.

#### Employee attitudes and innovation

This section reviews evidence surrounding the relationship between organizational level job satisfaction and product and technological innovation. It addresses the second part of the model detailed on page 3. The conceptual premise is that individuals are unlikely to make effective use of mechanisms established to manage learning where they are not motivated to do so, or where they have negative perceptions of their jobs, their colleagues and the rewards available to them. Some scholars argue that where there is distrust between management and employees, initiatives designed to promote learning are unlikely to be effective (Edmondson, 1996, 1999). Where employees experience satisfaction at work, their feelings towards working relationships, the nature of reward offered and the job itself will be positive, and it is more likely that they will experience 'intrinsic motivation' (Amabile et.al 1996). I argue therefore that job satisfaction has a role to play in determining whether individuals are willing to take advantage of any opportunities presented to experience variety and to develop skills.

A number of studies have reviewed the influence of job satisfaction on various measures of performance. For example, Judge, Thoresen, Bono and Patton (2001), in their meta-analytical review, found that employees' overall job satisfaction is correlated on average .30 with their work performance. Staw,

Sutton and Pelled (1994) found that positive emotion predicted subsequent employee performance, controlling for prior performance, education level, age and gender. At organizational level, Koys (2001) demonstrated that average employee satisfaction was significantly associated with subsequent company profitability. Bateman and Organ (1983) showed that there is a significant relationship between job satisfaction and organizational citizenship behaviour. George and Brief (1992) assert that positive affect is likely to engender 'organizational spontaneity', defined in terms of helping co-workers, protecting the organization, making constructive suggestions and developing oneself.

So whilst a growing body of evidence exists in favour of the positive impact of job satisfaction on a range of performance measures, there are few studies which specifically address the relationship between job satisfaction and innovation. The positive nature of such a relationship is by no means a forgone conclusion. Zhou and George (2001) showed how, in certain situations, people who are dissatisfied in their jobs are more likely than those who are satisfied to put forward suggestions for change and innovation. This is only the case where such dissatisfied individuals are nonetheless committed to staying with the organization, where they perceive that they have a voice and where they believe that the organization is willing to listen to them and to enact any changes proposed. The argument is that because people are dissatisfied, but still intend to remain with the organization, they have thought deeply about problems that they face and will thus put forward more radical ideas for change than would be the case otherwise.

Notwithstanding this study (which considers creativity rather than innovation as an outcome), there are strong theoretical arguments to propose that employees who are satisfied at work will contribute more effectively to the innovation process as a whole than those who are not. In order to be creative, individuals must be exposed to diverse perspectives and experiences, the implicit assumption being that they will in this way develop more flexible mental models and question their existing thinking. Isen, Daubman and Nowicki (1987) and Isen and Baron (1991) carried out a number of experiments outside the work environment designed to assess the extent to which positive mood influences creative problem solving and mental flexibility. They conclude that 'good feelings increase the tendency to combine material in new ways and to see relatedness between divergent stimuli.' They argue that their findings also have applicability in with work context. Indeed, there is some evidence that the beneficial outcomes of positive affect may be amplified in a work environment. Given that most individuals within organizations work within groups or teams, it seems likely that positive feelings experienced by one or more group members may influence others with whom they work closely. George (1996) raise the notion of 'group affective tone', proposing that if all or most individuals in a group tend to feel positive at work, then their cognitive flexibility will be enhanced as a result of group pressures to conform. It is possible that such an argument could also be applied at the level of the organization.

In addition, positive affect is likely to facilitate the development of trust, a state that has many potentially beneficial consequences for the creativity of individuals and the groups within which they operate. People are more inclined to speculate and to express unusual ideas when they work within an environment where they feel comfortable, where their ideas are not dismissed or mocked (Prince, 1975). In such an atmosphere, they are also more likely to feel able to acknowledge errors to others, an action which is potentially of great value in shaping the learning of the immediate work group (Edmondson, 1996; 1999) and engendering creativity and innovation.

Finally, substantial research evidence supports the idea that job satisfaction fosters 'extra role' behaviour (Bateman & Organ, 1983). In other words, people who are satisfied at work tend to be more inclined to engage in helpful behaviours, such as supporting others, putting forward suggestions for improvements and developing themselves. Such behaviours may be particularly relevant in determining, firstly, whether new ideas are generated and, secondly, the extent to which they are enacted. For example, an employee who is engaged in developmental activity is likely to become more creative through the process of being exposed to new thinking. Organizational members who are willing to support others may help to facilitate the application of new ideas generated by others. For a number of reasons, therefore, organizational citizenship or 'extra role' behaviour is likely to increase the probability that individuals will be creative in the first instance, that they will share their ideas with others and that

they will be willing to support initiatives put forward by other people. All three activities are fundamental to learning and innovation.

The discussion so far has argued implicitly that motivation and job satisfaction are one and the same. In fact, they are conceptually separate phenomena (see Patterson, Warr & West, *in press*). Job satisfaction refers to the internal state of individuals or groups of individuals, whilst motivation is concerned with the strength and direction of effort directed towards the achievement of goals. However, in practice, research suggests that it is difficult or impossible to distinguish between the two states, with people professing themselves to be satisfied at work also exhibiting high levels of motivation. This effect is likely to be amplified when job satisfaction is exhibited at organizational level, for reasons to do with ‘group affective tone’ outlined earlier (George, 1996). Furthermore, a number of motivation theories hold that individual behaviour is shaped through reward and reinforcement, with the underlying assumption being that individuals are motivated to perform well at simple tasks where a positive outcome, thus satisfaction, is likely to result from this (cf. Skinner 1948). For more complex tasks, motivation theories concerned with instrumentality and valence assert that people choose a course of action that is associated for them with positive affect (Vroom, 1964). So, for example, if they greatly value challenge and autonomy, they will seek to be associated with work activities that provide them with opportunities for operating in this way (Hackman & Oldham, 1976). Attitudes are also important in shaping behaviour: The theory of planned behaviour (Ajzen, 1991) seeks to predict

peoples' actions from a range of factors, including their attitudes particular aspects of work activity.

There is also a relationship between perceived job characteristics and motivation/job satisfaction. According to Hackman & Oldham (1976), jobs which offer exhibit particular characteristics are likely to provide job satisfaction and also to develop 'growth needs strength', thus enhancing motivation. In other words, where people have the opportunity to learn from their jobs and to improve their skills, they are likely to be more motivated and to experience higher degrees of job satisfaction- insofar as they have developed a high 'growth needs strength.' Highly motivated individuals are also more likely to rely on intrinsic rather than extrinsic motivation. Numerous studies have shown that higher levels of job satisfaction are reported where individuals are motivated in this way. For these reasons, it is argued that there is a strong and positive relationship between job satisfaction and motivation, and that both states are fundamental to shaping the propensity of organizations to learn and to enact innovation.

Hypothesis 13: there will be a positive relationship between organizational-level job satisfaction and product and technological innovation.

Hypothesis 14: there will be a positive relationship between aspects of the work environment which tend to promote learning and growth (such as autonomy and participation) and innovation. This effect will be mediated by job satisfaction.

### Innovation and organizational performance

Why is it important for organizations to achieve sustained innovation, and how can the different stages of innovation be managed? Whilst the relationship between innovation and performance is not empirically researched in the thesis, the theoretical basis for a positive association between innovation and performance is central to arguments proposed throughout. This section briefly examines a number of stage models of innovation and considers research exploring organizational antecedents to innovation, before reviewing research concerned with the innovation/ performance relationship.

West & Farr (1990, p.9) define innovation as ‘the intentional introduction and application within an organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the organization or wider society’. Innovation is thus different from change-, which does not necessarily involve the development and application of new ideas. Innovation can be represented in products/ services i.e. in technical systems, or in work organization, human resource or administrative systems. It denotes a purposeful activity designed to enhance work practice through replacing an existing way of operating with one believed to be more appropriate.

Theorists have long proposed that different challenges are posed by requirements to initiate new ideas (i.e. creating new knowledge) as opposed to implementing them (Rogers, 1983, Zaltman, 1973). Different behaviours are involved at different stages. The stages are not necessarily sequential, and the

argument is that individuals can therefore be required to exhibit different forms of behaviour, depending on the nature of his or her involvement in a particular innovation (Scott & Bruce, 1994). Mumford (2002, p.6) notes that 'one of the most noteworthy characteristics of creative people is that they have a substantial investment in expertise and the on-going development of expertise.' They also manifest high levels of achievement motivation, and research shows that they generally prefer to work relatively autonomously. This is in line with my argument that the intuiting process, discussed in the first chapter, is essentially an individual activity. However, as the creative idea is enacted, there is a need to involve a wide range of other people in the innovation process. Persuading others of the value of adopting a particular course of action is important. The process is risky and only likely to take place on a sustained basis where there is a willingness to consider alternative ideas to do with idea enactment and to tolerate failure where ideas do not work out as planned.

According to this argument, innovation is an organization-wide activity, requiring the active support of all its members. Damapour (1990), in an in-depth meta-analytical review of literature investigating organizational antecedents to innovation, showed that organizations with a high scope of innovation have developed appropriate structures and allocated sufficient resources to facilitate this outcome. Organizations can thus be differentiated according to the scope of innovation manifested. In other words, 'truly innovative organizations create a climate conducive to innovation in all their parts, not only in segregated units' (p.584). Eisenhardt and Tabrizi (1995, p.84) similarly propose that for such

organizations 'creating new products is a central path by which they adapt and sometimes even transform themselves in changing environments.'

Substantial research shows that where organizations are able to produce innovation on a sustained basis, organizational survival and growth are enhanced. For example, Tushman and Anderson (1986) present evidence to suggest that firms initiating technological change tend to grow more rapidly and are more likely to survive discontinuous change than those which fail to do so. Nystrom (1990) showed that profit and growth are related to creativity and innovation. Furthermore, Geroski (1994) demonstrated that organizations which fail to innovate across their technical and administrative activities are less likely to survive over the course of time, substantially less likely to be as profitable as organizations which are able to innovate and unlikely to be market leaders in their field. There appear, therefore, to be grounds for assertions that, for example, 'innovation is the key to winning- and keeping- leadership in world markets' (Adair, 1990).

### Conclusion

There are important theoretical reasons why people management strategies are likely to facilitate the learning required to produce sustained innovation. This chapter has explored the how learning mechanisms and HR practices represent opportunities for people to experience variety at work and also to develop the skills necessary to articulate the knowledge that they have acquired, resulting in organizational learning. The training and development literature is reviewed in detail to establish which mechanisms are most likely to

achieve the desired outcomes. For example, variety can be created through enabling employees to experience job rotation, secondments or customer visits. Skill can be developed through the use of techniques such as appraisals and through having a clear strategic focus for developmental activity. People management strategies create the conditions necessary for effective learning to take place. Organizations become better at learning – and thus at innovating- where HR strategies are focused upon achieving this result.

This is a neglected area in the literature. Very little empirical work has considered the impact of people management practices on organizational learning and innovation. Studies that do exist have assessed the overall relationship between people management activity and organizational performance. However, as discussed above, the capability to learn and to innovate may be a more important predictor of long-term viability and advancement. A number of studies are now presented to test the applicability of the proposed model in practice.

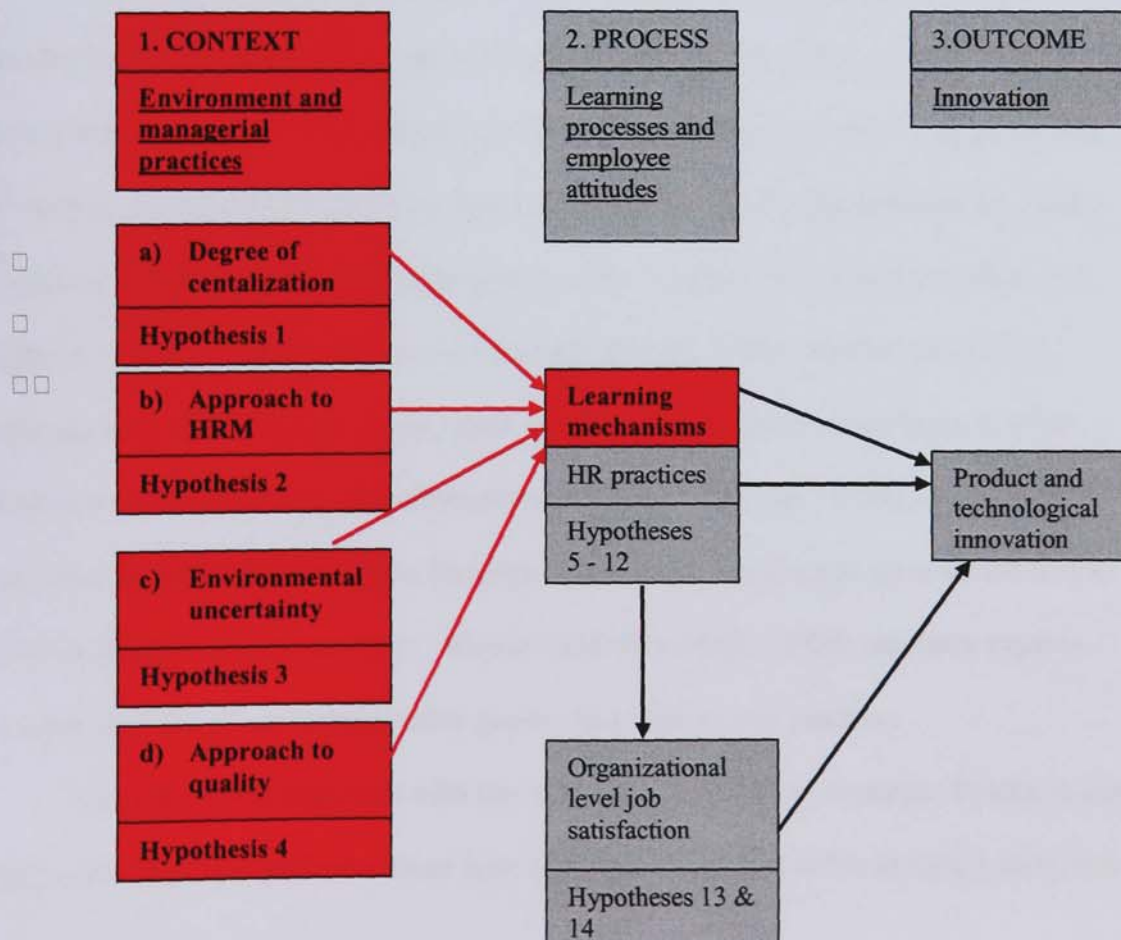
## CHAPTER 3

### The predictors of organizational learning

#### Introduction

The model presented in the last chapter proposes that a number of contextual variables predict whether or not organizations adopt mechanisms designed to enhance learning. In this chapter, I hypothesize that four variables will have this effect. They are environmental uncertainty, degree of centralization, approach to HRM and quality orientation. The model is reproduced below. The boxes and arrows highlighted depict the relationships researched empirically in this study.

#### Model guiding the research



The structure of the chapter is as follows. Firstly, I briefly review the theoretical rationale for the chapter. I draw upon learning network theory (Van de Kragt, 1998) and make reference to the 'developmental' school of organizational learning, which critically evaluates the extent to which managing organizational learning is feasible. The methodology for the study is then presented in some detail. This section provides the basis for subsequent studies, giving background information about the Centre for Economic Performance and the methodological framework for the research as a whole. I go on to detail the analysis and conclusions of this study before discussing the wider implications of the study for theory and practice and for the thesis as a whole.

#### Theoretical background

As discussed in the first chapter, there is no shortage of prescriptive texts which describe how companies can go about becoming 'learning organizations' and which assert the importance of 'transformational change' as a vehicle for challenging existing perceptions of individual and organizational capability. Such texts describe the ideal to which managers can aspire, and offer advice in terms of how to get there, through, for example, 'shared vision' and 'personal mastery' (Senge, 1990). Recent years have, however, seen increasing disillusionment with the apparent over-simplification of the whole process of achieving 'transformational change'. Sloman, (1999) for example, suggests that the whole idea of the learning organization has become an outdated notion which is unachievable in practice. Woodall and Winstanley (1998) similarly express concerns that there is an unbridgeable gap between theory and practice.

There are two difficulties with the 'learning organization' concept. Firstly, it does not provide any clear guidance about how organizations might arrive at such a state. For

example, it is complex and difficult to develop practices designed to engender 'double loop learning' (Argyris, 1992), or 'outward focus' (Pedler, Burgoyne & Boydell, 1999). Perhaps an organization's capacity to manage learning in this way is related to prior experience. In other words, perhaps 'learning processes evolve as an organization reaches the later stages in its development as affected by age, growth, management development or technological innovation' (DiBella 1995, p.288). Secondly, and relatedly, the 'learning organization' school of thought tends not to consider how those with responsibility for managing learning are themselves constrained by the system in which they operate. March and Olsen's (1963) theory of bounded rationality, for example, proposes that managers have limited capacity to adopt new and different ways of working because their thinking is shaped by the prevailing value system and acknowledged ways of operating.

#### Developing a capacity to manage learning

To what extent can organizations proactively manage learning so they are seen to epitomize best practice? I argued in chapter 1 that effective organizational learning involves behavioural change and is achieved through bringing together four processes: intuiting, interpreting, integrating and institutionalizing (Crossnan, Lane & White, 1999). Because much learning takes place within the workplace, it makes sense to develop interventions that draw upon the tacit skills of individuals and facilitate the sharing and dissemination of knowledge. Mentoring and coaching arrangements often work well because through such activities the learner can raise issues to do with the day-to-day conduct of work activity. Similarly, career development interventions present opportunities for learners to share concerns about their development and progression with more experienced practitioners. At the same time, it is important that any interventions devised promote the generation of internal variety. This should enable organizations to counteract the natural tendency to exploit what they are already good at rather than to

explore new territories. Opportunities for variety are presented when employees are encouraged to visit customers and suppliers, when they experience secondments to other parts of the company and where they are offered training in new and different work activities. Finally, given that organizational learning is concerned with the management and dissemination of knowledge, it is helpful for organizations to have in place strategies designed to support the storage and dissemination of knowledge and 'best practice' ideas. It is also important that there should be clear and categorical statements made in favour of the importance of learning and development. Such strategies emphasize the importance of knowledge creation and of knowledge sharing and thus provide focus for employees to develop the necessary skills.

In this study, the proposal is that organizations that have in place mechanisms designed to facilitate organizational learning exhibit a 'learning orientation.' Such an orientation represents a propensity to engage in effective organizational learning. Later studies (Chapters 4, 5, 6, 8 and 9) explore the relationship between learning orientation and performance.

#### Factors impeding the management of organizational learning

What might prevent organizations from adopting the mechanisms necessary to manage learning in some of the ways detailed above? I raised earlier the possibility that those with responsibility for managing learning are constrained by the system in which they operate. Learning network theory proposes that a number of 'actors'- senior managers, employee development practitioners, line managers and employees themselves- shape the 'learning system.' The learning system is 'a reflection of the collectively held beliefs and insights of the actors with regard to learning and training... this is how we deal with learning and training in this organization, this is our learning

culture' (Van der Krogh 1998, p.5). Thus, to manage organizational learning effectively, influential parties need to be convinced of the value of doing so.

A number of factors are likely to shape the commitment and motivation of senior members to invest time and resources into development of the learning system. Firstly, where structures are highly centralized, they may be unwilling to recognize the value of investing in learning, because of the structural constraints placed upon them. In other words, working within such a context, managers may be expected to manifest high levels of control, and thus will find it difficult and threatening to be faced with the demands of employees whose learning may lead them to question the need for such control. The detailed theoretical rationale for this proposition is expressed in chapter 2. In summary, the proposal to be tested in this study is as follows: -

Hypothesis 1: the degree of organizational centralization at one point in time will negatively predict the subsequent existence of management practices designed to promote learning orientation.

Secondly, organizations that have no experience of managing people strategically will not tend to attach high value to the design and implementation of organizational learning mechanisms. On the other hand, where there is commitment to the idea that HRM can contribute to organizational performance, there is a far greater probability that mechanisms designed to promote learning will be instigated and endorsed.

Hypothesis 2: The existence of effective and sophisticated HRM practices at one point in time will predict (positively) the subsequent existence of management practices designed to promote learning orientation.

Thirdly, managers are unlikely to endorse the implementation of mechanisms designed to create learning orientation if there is no perception of the need to change. Substantial research at team level suggests that external pressure is a powerful driver for

learning and innovation (Bunce & West 1995; West 1989). At organizational level, there is a case to suggest that environmental uncertainty will play a key role in determining whether or not organizations engage in higher order learning. As discussed in Chapter 2, in situations of uncertainty, high level skills will be demanded of employees, so to survive and flourish there will be an imperative to manage learning so that such skills can be acquired and shared with others. Therefore, organizations seeking develop a learning orientation need to consider how best to communicate external need, and to convince senior members of way in which organizational learning makes it possible to respond to uncertainty in the external environment. This is in line with the arguments of contingency theorists to the effect that organizations will tend to invest in training where employees need to manifest high skill levels, i.e. in situations of uncertainty (Lawrence & Lorsch, 1967; Duncan, 1979). In summary, I make the following proposition: -

Hypothesis 3: Environmental uncertainty at one point in time will positively predict the subsequent existence of managerial practices designed to promote learning orientation.

Finally, theory suggests that an ability to measure the impact of new managerial strategies is a critical determinant of the adoption of learning mechanisms (Adler & Cole, 1993). Garvin (1993) asserts that good measurement of learning processes and outcomes is likely to enhance the effectiveness of the learning taking place within organizations because it provides focus and clarity for developmental activity. Quality systems provide a powerful impetus for organizations that are seeking to manage learning proactively. They represent a mechanism by which the learning of individuals is focused upon the needs of the business. Not all organizations approach quality management in the same way, and some are more inclined than others to use the process as a developmental opportunity (Sitkin, Sutcliffe & Schroeder, 1994). I argue, however, that it is a relatively straightforward step to implement mechanisms designed to further promote

organizational learning in situations where organizations have experience of making quality systems work.

Hypothesis 4: The existence of extensive quality management practices at one point in time will positively predict the subsequent existence of managerial practices designed to promote learning orientation.

My overall argument is that the path towards the achievement of learning orientation is fundamentally shaped by factors such as environmental uncertainty (or perceptions of it), organizational structure and a commitment to manage people strategically and/ or to invest in quality systems. Previous actions and behaviours will either constrain or present opportunities for future development (Bell, Whitwell & Lukas, 2002; DiBella, 1995; Teece, Tisano & Schuen, 1997). Such ideas draw upon life-cycle and evolutionary models of organizational theory (e.g. March & Olsen, 1975) which argue that the consequences and outcomes of previous choices and actions restrict the set of strategic options available to the firm. Organizations will differ in their capacity and willingness to adopt sophisticated mechanisms designed to enhance learning activity. These ideas are tested empirically using the method detailed below.

## Method

### Background

As discussed in the introduction, the thesis draws substantially from a rich and varied data base established as part of a joint undertaking between the Centre for Economic Performance, London School of Economics, and the Work and Organizational Psychology Group based at Aston Business School. This ten-year study (described as the CEP programme) was conducted between 1990- 2000, and involved over 200 manufacturing organizations. The programme was intended to enable researchers to identify the determinants of manufacturing company effectiveness. Data are

longitudinal, thus making it possible to account for the impact of variables upon outcomes over time. For full details and the research programme and the way it is operationalized, see West, Patterson, Lawthom & Maitlis (1999).

The CEP programme was designed to achieve the following objectives: -

- To identify which managerial practices are positively associated with performance, measured in terms of economic performance and innovation.
- To explore the extent to which relationships exist between job satisfaction, employee health and the performance indicators as detailed above.
- To identify managerial practices likely to predict employee health and job satisfaction.
- To examine the relationship between organizational climate and economic performance.

Data were gathered from a variety of sources, as detailed in Figure 1. Some of the data are drawn upon for this study; other aspects of the data are considered in the following chapters. For example, many of the variables explored under the headings 'Market environment' and 'Organizational characteristics' are used to address the research questions for this study. Interviews in this area considered questions concerned with organizational structure, market environment, competitive strategies, production technology, work design, quality orientation, human resource management and research and development.

Figure 1: Centre for Economic Performance data (taken from West, Patterson, Lawthorn & Maitlis, 1999)



The methodology required senior managers to be interviewed every two years. Interviews took place on site for between one and two days. In addition, more than half of the organizations participated in employee attitude surveys conducted at two time points. These findings are considered in detail in chapter 7. Finally, innovation data were collected at two separate points in time points over the course of the research exercise. Full details of the innovation survey can be found in chapter 4.

There are particular challenges attached to setting up a research programme of this kind. Firstly, gaining access to organizations falling within the remit of the exercise represents a significant difficulty. Organizations were selected using a sectoral database, as detailed below. However, only a very small proportion of organizations approached was able to respond to requests for access (5%). Whilst this low response rate is potentially problematic, it is perhaps not surprising, given that participation presented significant demands. Managers needed to give up around two days per annum over the course of eight years. Employee attitude surveys were carried out within many of the organizations within the sample. In addition, companies were asked to divulge sensitive information about performance and profitability over this course of time.

Given the low response rate, it is possible that the organizations responding were not representative of the sample initially approached. However, an analysis of the ratio of firm labour productivity to industry labour productivity revealed no significant differences. Furthermore, the survey was intended to present an in-depth analysis of the firms that agreed to the research access. Thus, while it may not be strictly representative of UK manufacturing companies, it does provide a unique insight into the operation of the organizations within the sample, in greater depth than is frequently the case in surveys of this kind.

Companies were selected on the basis of their size, their product base and their mode of operating. They were drawn from the engineering, plastics and rubber, food and drink and the electronics sectors. The average number of employees was 260; the smallest company had 70 and the largest 900 employees. Thus, no organizations employed more than 1000 employees, and each organization was single site and involved in the manufacture of a single product. This homogeneity was important when considering the research design for a number of reasons. Most importantly, it is impossible to derive sensible comparative ratings from organizations that differ substantially in any of the ways detailed above. For example, an appraisal scheme within a large multi-national will be qualitatively different from one operating within a medium-sized manufacturing organization. Where this is reported using the same scale for both organizations, it is probable that these substantial differences will remain uncovered. Furthermore, when analyzing employee perceptions, it makes sense to incorporate measures of which employees have similar experience. For example, in multi-site operations, it is possible that employees will have very different experiences of training or participation, so the development of an aggregate score makes very little sense. Finally, when investigating organizational change, it makes sense to remove as far as

possible the impact of variables such as size, since large organizations may have at their disposal greater resources and higher levels of expertise than smaller ones. By failing to take account of size, it would be possible to reach erroneous conclusions about the relationship between managerial practices and organizational outcomes.

The research exercise takes account of the need for researcher reliability and consistency in a number of ways. Firstly, training was provided for all the researchers involved in the exercise, training which lasted for a minimum of two weeks. As the research programme commenced, researchers worked in pairs, visiting companies independently and rating them on various aspects of their functioning. This made it possible to reconcile any anomalies in the questionnaire schedule and also to ensure that researchers were rating the various aspects of the schedule consistently and reliably. In order to do this, researchers arrived at individual ratings for each major part of the questionnaire schedule. For each interviewer, a rating was taken for all the main sections of the questionnaire sections and correlated against the rating of a second interviewer.

The results are shown below: -

Rater A    .79 (n=21)

Rater B    .75 (n=17)

Rater C    .78 (n=19)

Rater D    .87 (n=3)

These results show a high degree of rater reliability across interviews.

It was also important that data were derived from the specialist most able to provide this information. Therefore, the survey was designed to ensure that detailed interviews were conducted with the member of staff perceived to be informed about the subject in question, for example, the Managing Director or Marketing Director of each company answered questions relating to competitive strategy. The Personnel or HR

Directors answered questions concerned with HR practices and learning organization issues.

### Sample

This study analyzes data drawn from 44 manufacturing companies at Time 1 and Time 2. The 44 companies have been selected because data exist for the four variables detailed above at Time 1 (degree of centralization, approach to HRM, environmental uncertainty and quality orientation) and for learning orientation at Time 2.

Pettigrew (1985) notes that longitudinal research allows the user to gather 'time series data' which makes possible broader consideration of possible correlations between processes and outcomes than would be the case through using cross-sectional methods. The advantage of using longitudinal data for this research lies in the way in which it allows time for the impact of initiatives to be felt. Using longitudinal data allows us to understand more about the underlying conditions leading to the establishment of learning mechanisms.

### Measures

**Learning orientation:** HR Directors and Personnel Managers were asked fourteen questions which elicited information designed to uncover this attribute, as follows: -

*1. Do you have information on training courses that might be of value to employees readily available?*

*2 & 3. Is there a formal recognized procedure by which employees meet with their manager/ supervisor to discuss their long-term career development?*

*For management*

*For shop-floor*

*4. Are visits arranged to external suppliers or customers from employees who would not normally have such contact as part of their normal job responsibilities?*

*5 & 6. Are employees working in one department ever seconded to another department so that they can learn more about the processes and procedures in those areas? (I.e. generally for at least a week, and not for the purposes of covering absences)*

*Management*

*Shop-floor*

*7. What proportion of employees have an official role/ explicit responsibility to coach and teach other relevant skills?*

*8. Does the company support learning/ training that is not work related? E.g. basic skills, hobbies, such as through TEC supported Employee Development Schemes or Employee Led Development, or other such employee development skills?*

*9 & 10. Is training available to employees that is work-related, but not directly necessary for the individuals' current job? (E.g. learning about processes that occur in other parts of the factory, courses to increase computer skills)*

*Management*

*Shop-floor*

*11. Do you have a formally recognized mentoring system (a formal systems where an employee has a named colleague who provides advice and guidance on a regular basis)?*

*12. Do you have any procedures for recording solutions to problems or best practice?*

*13. Do you have any mechanisms by which this knowledge (problem solutions or best practice) is transferred to other areas of production?*

*14. Do company policies, strategies or vision statements in any way refer to the importance of learning and/ or employee development?*

The variable 'learning orientation' was created as an aggregation of these 14 items. As can be seen, all items were binary except for the proportion of employees with an explicit responsibility for coaching and teaching relevant skills, which was treated as a percentage with a value between 0 and 1. The aggregation was to have been a sum, except that a few companies had some missing data: therefore a mean was calculated as long as at least 11 of the 14 items were present. A reliability test showed that Cronbach's alpha for the items was 0.84, which was satisfactory. This mean was then treated as a 'learning mechanisms' score.

Scores for the variables measured at Time 1 were arrived at as follows: -

**Degree of centralization:** Interviewees were asked at what level in the firm action could be taken in relation to 14 aspects of performance without written confirmation from above. Options included operator, supervisor, manager, and manager reporting to Chief Executive and above Chief Executive. The rated aspects of performance were as follows: spend unbudgeted money on capital expenditure items, create a new job; determine a new product; determine the pricing of a product, determine the size of the labour force; dismiss an operator; decide which production plans are to be given preference and which suppliers are to be used; decide on the selection of an applicant; when overtime should be worked; allocation of work amongst available operators; when to stop production because of quality problems. The measures of centralization are modified from the structural measures devised by the Aston group (Pugh et.al. 1968)

The score used was calculated as a mean of these items ( $\alpha = .82$ )

**Approach to HRM:** A range of information was sought in connection with HRM. Interviewees were asked to indicate the job title of the person holding responsibility for personnel matters, and to outline the proximity to the Board of Directors of this person. They were asked whether or not there was a personnel/ HRM strategy. They were probed about where responsibility lay in connection with a range of HR domains, such as pay, industrial relations and recruitment and selection. Interviewees were asked to indicate whether line management, line management in consultation with Personnel, Personnel, Managing Director or Board took key decisions in these areas. Other questions probed the degree of computerization existing within the department, the nature of reward systems, in relation to operatives, clerical staff, supervisors and management and the extent to which pay bargaining took place within the particular site or elsewhere.

Respondents were asked whether or not they had a stated policy on equal opportunities and for figures relating to employee turnover and redundancies. They were asked whether there was a training strategy, whether there were minimum annual training requirements for all and whether or not the company systematically analyzed employee training needs. There were questions on the degree of interest demonstrated in the Investors in People award. On the basis of these questions, interviewers rated the companies on four dimensions: how much effort is put into HRM; how well planned is the HRM policy; how sophisticated is the HRM policy and how effective HRM policy is overall. These were rated on 5-point scales and the HRM score taken as the mean ( $\alpha = 0.95$ )

**Environmental uncertainty:** Eight semantic differential scales were used to measure environmental uncertainty. These include scales concerned with speed of product obsolescence, predictability of the actions of competitors, ease of forecasting demand and consumer tastes, stability of the product technology or production process, availability of suppliers and actions of suppliers and supply of suitable labour. Managers were asked to indicate on these 7 point semantic differential scales, the extent to which the environment was uncertain, for example 'the frequency of new products in this industry is low' versus 'There are very frequent introductions of new products'. Some of these bipolar semantic differentials were adopted from Khandwalla (1974).

The score used was calculated as a mean of these items. ( $\alpha = 0.67$ )

**Quality:** Managers principally concerned with quality were asked whether or not there was a written statement on quality and whether there was in place a formalized quality programme such as TQM or BS 5750. They were asked to indicate on a five-point scale (from 'not at all' to 'very extensively') whether they used SPC and SQC. They were questioned about who had received training in 'quality issues' (from 'shop-

floor' to 'directors') and the sort of training in quality issues provided (with possible responses ranging from 'no training' to 'very extensive training'). Respondents were probed about whether quality circles, quality improvement teams or team working on the shop floor were used with the aim of improving quality. They were asked whether or not quality was evaluated in terms of defect rates, scrap, customer complaints or unit costs. They were also asked whether or not there had been changes in organizational design relating to a quality initiative- changes such as flatter hierarchy, improved communication, increased worker responsibility and increased team working.

**Control variables:** Two control variables were used for the study: size and profitability. The measure of organizational size was derived by counting the number of full-time equivalent employees in each organization. These data were log transformed in all analyses to normalise the distribution. Profitability was calculated by drawing upon three main sources of information: company accounts, management accounts and the Central Statistical Office (CSO) database. Profitability was measured as profits before tax, deflated by the producer price index of the industry in which the firm belonged and normalized on firm employment to control for size. The purpose of using control variables was to ascertain whether any relationships between dependent and independent variables were due to the impact of extraneous variables, specifically, size and profitability.

#### Analytic procedure

The overall analytic strategy was designed to determine the extent to which the hypotheses were supported by the data by using regression analyses. The analyses involved assessing the extent to which the four variables detailed above predicted learning orientation, controlling for organizational size and prior profitability. Without using these controls, it would be impossible to discount the argument that any significant

relationships observed were attributable not to the variables considered in the study but to the larger size or additional resources of the organizations in the sample.

The independent variables from the first point in time (centralization, approach to HRM, environmental uncertainty and approach to quality) were entered into a regression separately. The mean score for learning orientation was the dependent variable, and this measurement was taken at the second point in time. I followed a similar procedure for each constituent element of environmental uncertainty. Results are reported with reference to the adjusted  $R^2$  score, since this figure takes into account variance which may be attributable to a relatively small sample size.

## Results

Table 1 contains means, standard deviations and intercorrelations among all the variables. A number of statistically significant correlations can be observed. High levels of centralization are, on the whole, negatively associated with the other study variables. There is a statistically significant negative correlation between high levels of centralization and learning orientation ( $r = -.32, p < .05$ ). There is also a statistically significant negative relationship between centralization and approach to HRM ( $r = -.24, p < .05$ ). There is, on the other hand, a positive relationship between approach to HRM and learning orientation ( $r = .41, p < .01$ ) and between approach to quality and this outcome ( $r = .44, p < .01$ ). These results present support for Hypotheses 1, 2 and 4. These stated respectively that the degree of centralization at one point in time would negatively predict learning orientation, and that the existence of effective HRM and quality practices would positively impact upon this outcome. I did not find a significant relationship between the mean for environmental uncertainty and learning orientation, thus not finding support for hypothesis 3.

Table 1

Means, Standard Deviations and Correlations for all Study Variables

| Variable                                 | Mean | SD   | 1     | 2     | 3     | 4   |
|--|------|------|-------|-------|-------|-----|
| 1. Learning orientation<br>(Time 2)      | .33  | .25  |       |       |       |     |
| 2. Organizational structure<br>(Time 1)  | 3.50 | .52  | -.32* |       |       |     |
| 3. Approach to HRM<br>(Time 1)           | 2.61 | .86  | .41** | -.24* |       |     |
| 4. Environmental uncertainty<br>(Time 1) | 3.31 | .88  | .22   | -.06  | .14   |     |
| 5. Approach to quality<br>(Time 1)       | 4.22 | 3.00 | .44** | -.18  | .48** | .07 |

\*  $p < .05$ ; \*\*  $p < .01$   
 $n = 44$

Moving to Table 2, results presented show that most of the relationships observed in the first analysis are also found in a regression, taking account of control variables. Both approach to HRM and approach to quality account for 10% and 16% of the variance for learning orientation respectively ( $\beta = .38^*$  and  $.47^{**}$ ). Centralization, however, ceases to be significant when control variables are taken into account, although the regression co-efficient for this variable continues to be negative ( $\beta = -.27$ ). The mean for environmental uncertainty is not significant when entered into a regression. Results presented in table 3, however, show that there is a positive relationship between one

aspects of environmental uncertainty- frequency of change of technology- and learning orientation ( $\beta = .35$ ,  $p < .05$ ). This aspect of environmental uncertainty accounts for 11% of the variance for learning orientation.

Table 2

Summary Of Hierarchical Regression of Learning Orientation onto Degree of Centralization, Approach to HRM, Environmental Uncertainty and Approach to Quality

| Independent variables     | Dependent variable        |              |                       |
|---------------------------|---------------------------|--------------|-----------------------|
|                           | Learning orientation (T2) |              |                       |
|                           | $\beta$                   | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls                  |                           | .04          | .02                   |
| Degree of centralization  | -.27                      | .05          | .03                   |
| Controls                  |                           | .08          | .03                   |
| Approach to HRM           | .38*                      | .11          | .10                   |
| Controls                  |                           | .03          | .08                   |
| Environmental uncertainty | .21                       | .04          | .04                   |
| Controls                  |                           | .08          | .03                   |
| Approach to quality       | .47**                     | .17          | .16                   |

\* $p < .05$ , \*\* $p < .01$ ;  $n = 44$

In summary, this study presents some, but not complete, support for hypothesis 1, that the degree of organizational centralization at one point in time will negatively predict the subsequent existence of management practices designed to promote learning orientation. The relationships exhibited in both correlation and regression analyses are negative. However, while the relationship presented in Table 1 is statistically significant, this ceases to be the case when control variables are taken into account (as detailed in Table 2). Similarly, results for hypothesis 3, that environmental uncertainty at one point in time will positively predict the subsequent existence of managerial practices designed to promote learning orientation, are ambiguous. The mean score for environment uncertainty is not significant when entered into a regression with learning orientation as the dependent variable. However, when exploring in more depth whether or not particular aspects of environmental uncertainty were significant, some support for hypothesis 3 did emerge. It appears that organizations which are required to engage in frequent changes of technology are more likely to exhibit a learning orientation than those which do not have the same pressures to constantly update technology.

Substantial support is presented for hypothesis 2, that the existence of effective and sophisticated HRM practices at one point in time will predict (positively) the subsequent existence of management practices designed to promote learning orientation. (This result must, however, be interpreted with caution, as outlined in the discussion and conclusion sections). Support is also found for hypothesis 4, which proposes that the existence of extensive quality management practices at one point in time will positively predict the subsequent existence of managerial practices designed to promote learning orientation. Both relationships remain statistically robust even where control variables are taken into account.

Table 3

Summary of regression of learning orientation onto variables measuring environmental uncertainty

| Dependent variable                                    |                                       |              |                       |
|---|---------------------------------------|--------------|-----------------------|
| Independent variables (T1)                            | Learning Orientation (T2)             |              |                       |
|   | Standardized regression co-efficients | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls  |                                       | .08          | .04                   |
| Frequency of change of technology of product/ process | .35*                                  | .12          | .11                   |
| Controls  |                                       | .08          | .03                   |
| Rate at which product becomes obsolete                | .13                                   | .00          | -.09                  |
| Controls  |                                       | .09          | .04                   |
| Unpredictability of competitors' actions              | -.13                                  | .01          | -.24                  |
| Controls  |                                       | .08          | .02                   |
| Unpredictability of demand and customers' tastes      | .03                                   | .00          | .22                   |
| Controls  |                                       | .09          | -.02                  |
| Unpredictability of suppliers                         | .04                                   | .00          | .07                   |
| Controls  |                                       | .09          | -.01                  |
| Hostility in the industry                             | .04                                   | .00          | -.04                  |
| Controls  |                                       | .07          | -.02                  |
| Scarcity of supply of labour                          | .02                                   | .00          | -.06                  |

\*p<. 05, n= 44

## Discussion

I suggested in the introduction that organizations can develop practices to manage organizational learning where they take account of the organizational learning cycle (intuiting, interpreting, integrating and institutionalizing) and where they ensure that learning is perceived to be relevant to the work environment. I also proposed that, for a number of reasons, organizations do not necessarily implement mechanisms designed to achieve this effect, despite general acknowledgment by both practitioners and academics of the need to do so. It seems reasonable to argue that organizations will manifest a propensity to engage in higher order learning- or 'learning orientation' where the external environment is turbulent and/ or the organization has the skills and expertise to instigate training activity.

This study presents some evidence in support of these arguments. I found that organizations that adopt a pro-active approach towards the management of quality are much more likely to implement mechanisms designed to promote higher order learning than those which do not exhibit such a commitment. The study shows that there is a statistically highly significant beta co-efficient between quality orientation at Time 1 and learning orientation at Time 2 ( $\beta = .47, p < .01$ ).

There are a number of explanations for these findings. Perhaps a focus on quality moves people management away from the domain of 'experts' towards the wider organization. In other words, a concern with quality requires everybody to commit towards achieving the necessary levels of skill to make the initiative work. Perhaps companies operating quality initiatives successfully are in a strong position to argue in favour of the importance of introducing further initiatives designed to enhance learning

processes. People are convinced of the value of development, and have made progress in working together as teams and sharing insights with one another. Moving towards 'learning organization' status is a natural progression rather than a transformation of existing attitudes, and the learning system is allowed to develop in a way which is conducive to the achievement of higher order learning.

There is, further, a strong correlation between approach to HRM and learning orientation ( $\beta = .41, p < .01$ ). Although these findings must be interpreted with caution (there may be an overlap between the independent and dependent variables, as discussed in the final section of this chapter), they are deserving of further comment. It makes sense to suggest that organizations have a higher chance of developing a learning orientation where they have previous experience of managing people effectively, for two reasons. Firstly, those with responsibility for managing 'higher order' learning must themselves exhibit effective people management skills if the initiatives they propose are to be effective. Secondly, employees are only likely to enthusiastically endorse higher order learning initiatives where the broad HR framework presents support for their efforts (for example, where they are rewarded for the acquisition of new skills). Indeed, empirical research has shown that there is a distinction between technical and strategic HRM effectiveness, and that the latter tends to build upon the former in order to achieve performance outcomes (Huselid & Schuler, 1997). Many HR scholars argue that it is necessary to achieve horizontal integration between various aspects of HRM – planning, recruitment and selection, appraisal, training and reward – in order to engage in higher order learning (Delaney & Huselid, 1996; Delery & Doty, 1996). Qualified support for this possibility is presented in this study.

There is a significant statistical correlation between one particular facet of environmental uncertainty, that relating to the technology of the product/ production process. The hypothesis that 'environmental uncertainty at one point in time will positively predict the subsequent existence of managerial practices designed to promote learning orientation' is supported where uncertainty relates to technologies employed, but not where uncertainties centre on the changing requirements of customers. This finding presents some support for the environmental alignment argument – in other words, it is necessary for organizations where technology is changing rapidly to pay particular attention to ways in which to manage learning. Changes in technology frequently require substantial changes in working practices, so it is important that employees are able to learn rapidly both how to operate the new technology and also how to work in a different way with colleagues when new technology is introduced. Other aspects of environmental uncertainty considered in the study- obsolescence of products, predictability of competitors' actions and consumers' tastes- may not impact so directly upon the day-to-day jobs of the majority of the workforce. Much of the workforce tend not to have so much direct contact with customers or play a strong role in developing new products because their roles do not enable them to achieve this type of interaction.

There is a statistically significant negative correlation between centralization and learning orientation ( $r = -.32, p < .05$ ). Although this relationship is not significant when controls are taken into account, it is still negative, suggesting some qualified support for hypothesis 1. This possibility is further born out by the statistically significant negative correlation between approach to HRM and learning orientation ( $r = -.24; p < .05$ ). Perhaps, as I suggest in the introduction, highly centralized structures tend to suppress,

rather than enhance, organizational propensity to engage in higher order learning. The negative correlation between this variable and approach to HRM suggests that such structures are not conducive to the establishment of a proactive people management strategy. This finding is in accord with a wide body of theory. Management theorists, such as Burns and Stalker (1961) referred to in chapter 2, recognize the limitations of highly centralized structures. Such structures tend to remove control from employees, thus depriving them of opportunities for making decisions themselves and learning in the process. Such structures make it difficult for people to learn through being exposed to different experiences and perspectives, because doing so requires individuals to move outside existing hierarchies. Furthermore, mechanisms designed to produce 'higher order' learning tend to increase peoples' expectations of work. This may mean that they are less willing tolerate high levels of managerial control. Again, this represents a threat for the continued operation of highly centralized structures. Finally, Cyert and March (1963) argue that firms are 'boundedly rational', i.e. managerial thinking is limited by context. This suggests that those with responsibility for the 'learning systems' are inhibited by the organizational structure to which they are party. They are thus unlikely to see the purpose or value of seeking to achieve higher order learning, perhaps because they are aiming to make the existing structure work better.

I suggested in the introduction to this study that organizations differ in their capacity and willingness to adopt sophisticated mechanisms designed to enhance learning. This study provides evidence to support this idea. It suggests that there is a relationship between past experiences and histories at one point in time and organizational endorsement of practices designed to facilitate learning at a later stage.

This is in line with theory suggesting that the learning organization represents a phase or objective in an organization's evolution (DiBella, 1995, March & Olsen, 1975, Van de Ven & Poole, 1995). According to this argument, moving beyond learning for improved efficiency, involving the simple detection and correction of errors happens as the organization matures. To what extent do such theories rule out the possibility of managerial intervention? According to Sinkula (1994), organizations develop a learning orientation where a clear commitment is made to the establishment of higher level learning initiatives. In other words, managers can select the organizational characteristics that improve the likelihood that a learning culture will eventuate. The end result will, however, be shaped by developments that have taken place in the past; thus, organizations are very different from one another in the way in which they implement and endorse learning initiatives.

According to the evidence put forward in this study, it would seem that managers need to consider and take action around a number of organizational characteristics. Firstly, it is important to assess whether existing structures facilitate or impede the establishment of higher level learning initiatives. Where rigid, hierarchical structures are manifest, it may be necessary to effect change in this area before considering how to develop a learning orientation. Secondly, it may be possible to accelerate progression towards achievement of the 'learning organization' model by engaging in quality initiatives. Where such initiatives convince the wider organization of the purpose and value of engaging in continuous improvement, it is probable that any initiatives introduced to facilitate higher order level will be endorsed and supported. Finally, there is a case for arguing that organizations which engage in strategic human resource

management will be in a strong position to develop practices designed to facilitate higher order learning at a later point in time. Such organizations are likely to have prior experience of establishing systems to provide focus for behaviour (e.g. performance management), to motivate (e.g. performance-related pay) and to facilitate participation (e.g. staff consultative groups). Therefore, developing mechanisms designed to generate higher order learning will represent a natural progression. There is likely to be widespread support for the notion of the learning organization at all levels. In addition, those responsible for instigating such initiatives are likely to exhibit strong people management skills themselves, so that support is available for employees as they gain knowledge and establish dialogue with others.

### Conclusion

This chapter makes a contribution to the learning organization literature in a number of ways. The literature tends to suggest that organizations can move towards achievement of the model without much concern for context. Findings in this chapter suggest that history and previous experience are of importance in determining whether or not organizations manifest commitment to higher-level learning. To exhibit such a commitment before organizational members are open to the possibilities presented in this way may be counter-productive. In other words, unless the organization has previous experience of engaging in human resource management activity, it may not be realistic to expect those charged with implementing the learning system to be able to generate the necessary positive outcomes. Furthermore, without some experience of engaging in learning activity- albeit at a lower level, through, for example, continuous improvement- it may not be possible to persuade others of the importance and value of setting up

sophisticated mechanisms designed to promote higher order learning. Such a perspective is in accordance with theories arguing that that change in organizations is of an evolutionary nature, with each adaptation building upon, or being constrained by, what has happened in the past (Sinkula, 1994).

Overall, this study presents substantial support for the first part of the model outlined in Chapter 2. It provides evidence to endorse the idea that environmental uncertainty, approach to quality and HRM and organizational structure all play a role in determining whether or not organizations develop practices intended to promote higher-order learning. In addition, this study builds upon the theoretical framework detailed in chapters 1 and 2. It takes into account the main theories of organizational learning and suggests that the fourteen variables detailed in the methodology enable organizations to work through the four stages represented in Crossnan et. al.'s (1999) model of the process.

There are a number of methodological limitations implicit in this study. There is a need for far greater analysis of some of the factors identified than has been possible in this chapter. For example, it would be interesting and significant to know what particular factors within quality orientation or approach to HRM facilitate learning orientation. Furthermore, there are other variables- such as leadership- which may play a role in determining whether organizations can overcome some of the limitations associated with their historical legacies. Such variables have not been considered in this study. In addition, statistically significant findings do not in themselves denote causality. It is possible that the relationships between the variables considered in the study can be explained by another factor that has not been identified in the theoretical section.

Perhaps most importantly, I do not have a time 1 measurement of learning orientation. This means that one cannot rule out the possibility that the organizations in the study may already have exhibited mechanisms associated with higher order learning at the first point in time. This possibility makes it necessary to interpret the findings with caution. As discussed above, this is particularly the case for data presented exploring the relationship between approach to HRM and learning orientation. It is probable that these variables share a significant amount of variance, but I was unable to test for this possibility because I did not have learning orientation data for time 1.

Whilst this limitation does have a bearing on the broader findings, it is less likely to be an issue for the other variables in the study. Theory suggests that there will be little shared variance between centralization, environmental uncertainty and approach to quality and the dependent variable, i.e. learning orientation. Furthermore, the longitudinal research design is a significant strength of the study. It makes sense to suggest that a variety of factors in the internal and external environment will, over the course of time, impact upon organizational functioning and effectiveness.

There are many unanswered questions to do with achieving the learning organization model. Some organizations are able to respond rapidly to changes in the external environment and to develop mechanism designed to facilitate learning rapidly. Other organizations are unable to do so. There is evidence that certain internal initiatives- such as a commitment to quality programmes- may provide a useful basis for organizations to work from developing a commitment to higher level learning. But not all organizations committed to the achievement of quality awards would define themselves as learning organizations. More research is needed to develop a clearer

conceptualization of the pre-requisites for a commitment to higher-level learning. One could refer to a wider sample of organizations, for example, and adopt similar quantitative techniques, to focus in detail upon specific contextual variables, such as quality management or environmental uncertainty. One could look at the extent to which these variables impact upon learning orientation, perhaps by taking before and after measurements of the perceptions of those influencing organizational learning systems. Alternatively, it would be of value to focus on specific organizations and to look in detail at what factors influence those with responsibility for learning. Perhaps most importantly, when implementing mechanisms designed to enhance higher order learning, one needs to have a clear understanding of what can be achieved through doing so. Longitudinal research, focusing on developments over time, is most likely to yield valuable insights into these and other questions.

This study suggests that adopting a learning orientation is by no means straightforward. The next part of the thesis looks at the extent to which learning orientation predicts performance outcomes. Chapters 4, 5 and 6 explore the relationship between the existence of practices designed to enhance organizational learning at one point in time and innovation approximately one year later.

## CHAPTER 4

### Learning mechanisms and innovation

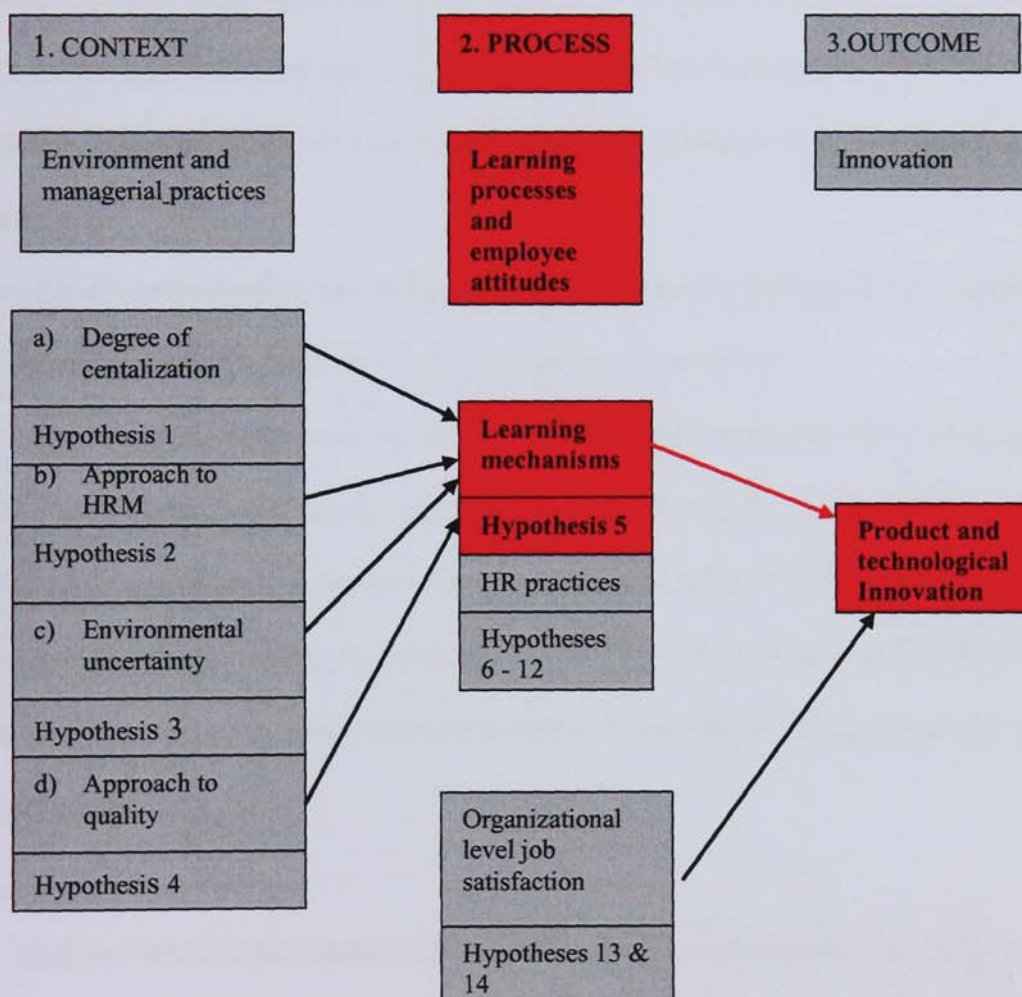
#### Introduction

In the last chapter, I made reference to fourteen learning mechanisms that, applied consistently, have the potential to enhance organizational learning. Not all organizations will manifest the commitment and motivation necessary to implement learning mechanisms. Research in chapter 3 revealed that organizations tend to develop a learning orientation, i.e. to implement learning mechanisms, where factors within the internal and external context make it possible for this to happen. Highly centralized structures, for example, are not conducive to the creation of an environment where people are encouraged to question and challenge existing ways of thinking and acting. In the same way, unless organizations have previous experience of managing people strategically- whether it be through implementing quality systems or through having a vision and plan for the people in the organization- it is unlikely that significant value will be attached to developing mechanisms designed to facilitate organizational learning.

Is it worth making the effort to implement learning mechanisms? This chapter is the first of three to look in detail at the extent to which such practices 'add value' to the organization. This study tests empirically the second part of the theoretical model detailed below and the highlighted boxes depict the relationships assessed. The theoretical premise guiding the chapter is expressed in chapter 2. In brief, I make the following proposition: -

Hypothesis 5: where organizations employ all or the majority of the practices outlined in chapter 2 to manage learning, they will produce relatively high levels of product and technological innovation at a later point in time.

### Model guiding the research



This and the following two studies consider the following questions: -

1. Is there a positive relationship between the existence of learning mechanisms and innovation in the organizations within the sample? Arguably, the learning mechanisms considered in the second chapter and detailed below have a stronger effect upon organizational learning than HR practices because of the way in which they create variety and develop skills simultaneously.
2. Is there a positive relationship between, firstly, the existence of strategic-level people management practices and innovation and, secondly, between operational-level people management practices (specifically, training, induction and appraisal) and innovation?
3. To what extent do mechanisms designed to create internal variety and those intended to develop skills both separately and jointly predict innovation?

The conceptual framework for the studies was established in the first and second chapters. Learning mechanisms, as a general rule, promote variety, whilst other people management practices such as appraisal develop peoples' skills. Both interventions will promote organizational learning to some degree. This will be the case particularly where mechanisms designed to enhance variety are used in conjunction with practices intended to develop skills.

### Method

This and the next two studies draw upon the Centre for Economic Performance database, described in detail at the beginning of the last chapter. After providing a brief overview of the methodological approach adopted for this and subsequent studies, I outline how the dependent variables are operationalized and detail the analytical strategy

employed. I also describe the measures used for the studies presented in chapters 5 and 6. All three studies address the theoretical premise outlined in the second chapter, that people management elicits organizational learning, which in turn leads to the production of sustained innovation.

### The overall approach

Various types of innovation, described below, represent outcome variables for this and subsequent studies. As was the case for the previous study, the research design is longitudinal. This and the next two studies draw upon data collected at three separate points in time. At time 1, I take account of control variables; at time 2, I measure learning mechanisms/HR practices and at time 3, I analyze dependent variables. This makes it possible to argue that the relationship between dependent and independent variables has developed over time and strengthens the case for cause/effect associations.

### The Innovation Survey

Information on organizational level innovation was gathered through a postal survey. The survey was used to measure organizational innovation within the UK manufacturing companies in the sample for products, production technology and production techniques/procedures. The questionnaire was labeled a 'change' survey rather than an 'innovation' survey as it was felt that the term 'innovation' may have required additional explanation and may have been more subject to social desirability bias. The survey consisted of three main sections: changes in products, production technology and production techniques/ procedures (technological innovation). The measure of innovation in technical systems was derived through interviewer analysis of overall rates of innovation in the three areas detailed above.

**Changes in products:** Respondents gave estimates of the number of entirely new and adapted products developed in the last two years. They also detailed the percentage of production workers involved in making the new products; current sales turnover accounted for by the new products; and the extent to which production processes had been changed to accommodate the new products.

**Changes in production technology:** Production technology changes included the introduction of new machines or systems such as single cycle automatics, CNC and robots. Respondents listed the three most significant changes in this category introduced over the previous two years. They also gave estimates of the magnitude and novelty of the change for their organization on a three-point scale, ranging from 1 -- “minor”, through 2 -- “moderate”, to 3 -- “major”. Further questions concerned the percentage of production workers requiring retraining to use the different technology, and the proportion of the total production process incorporating the technology.

**Changes in technical systems:** This depiction of innovation was based upon interviewer ratings of the extent to which the organization adopted an innovative approach towards technical systems generally. This required them to think about innovation in products, production technology and production techniques and to rate the organization on a scale 1 – 7 according to whether or not they believed that the organization was innovative in these areas.

**New and improved ways of doing things:** The final section consisted of a checklist of 22 areas where improvements may have been introduced over the previous two years. Respondents indicated whether they had introduced no, minor, moderate or major improvements in each area. Areas were production planning and control systems,

manufacturing technology, sales and marketing strategy, customer service strategy, research and development investment, information technology use, organizational structure, product quality control and total quality initiatives. This information was used as an additional way of cross-checking the validity of respondent ratings of innovation in products, technology and processes.

The researchers were all I/O psychologists with considerable experience of site visits, and interviews with senior management, in UK manufacturing companies. Each section was given an innovation rating on a five-point scale from 1 'not at all innovative' to 7 'very innovative'. These were based on the types of change introduced, their magnitude and novelty and the impact on the workforce and the manufacturing process. Raters gave an overall innovation rating to each company. Innovation ratings for the final checklist section were obtained by summing the number and level of improvements indicated. 0 indicates that no improvement made in a particular area. Minor improvement was scored 1, moderate -- 2 and major -- 3.

**Procedure:** The questionnaire was piloted in six companies and, following minor changes to terminology, was sent out to companies. For each company a questionnaire was sent to the Managing Director and the head of production operations. Multiple copies were sent in order to increase the response rate and for the purpose of checking reliability of responses. Eighty-one out of 111 companies returned completed questionnaires. Twenty-two of these companies were used as the basis for this study, since these companies also responded to questions surrounding learning mechanisms and HR practices.

To check for differences in innovation ratings by respondents between those companies where the respondent was or was not the Managing Director, analyses of variance were run on all innovation measures, with respondent position as the independent variable, controlling for organization size. There were no significant differences.

**Reliability and validity of innovation measures:** Concurrent validity was assessed by correlating innovation ratings in the three domains and overall, with the aggregate of employee ratings of the climate for innovation in 37 of the original sample (Lawthom, Patterson, West, & Maitlis, 1999). Researchers took into account managers' interview ratings of overall change in technology, products and processes in the previous two years; and the data produced from the innovation inventory describing 22 areas where changes might have been introduced. Concurrent validity was further established by taking into account employees' ratings of company innovation. These were found to correlate significantly with questionnaire-based ratings of innovation in products, technology and overall innovation. Furthermore, the score from the checklist of the last two years' improvements was correlated with the overall innovation ratings, since the checklist items are not taken into account during rating. A significant positive correlation was found ( $r = 0.49$ ,  $p < 0.001$ ) between the two measures. In addition, ten follow-up site visits and interviews were used to validate information from the postal questionnaires. Over ninety percent of innovations noted in the postal questionnaires were subsequently observed on site. Concurrent validity is therefore acceptable.

To assess the reliability of the ratings of innovation, three researchers double rated forty questionnaires from the original 81 organizations. All questionnaires were

assessed initially by rater A. For rater A and rater B, Kendall's coefficient of concordance was .86 ( $p < .001$ ). For raters A and C the coefficient was .80 ( $p < 0.001$ ). Where more than one manager completed questionnaires in firms (in 27 firms), inter-rater agreement was calculated across the questionnaire items. The average reliability was 0.94.

#### Independent variables

Managers were asked to describe the mechanisms employed to manage organizational learning, firstly at a strategic level and secondly at operational level. Full details of the elements of the learning organization score are provided in chapter 3. In brief, respondents were asked whether 'company policies, strategies or vision statements referred in any way to the importance of learning/ employee development'. They were also asked to detail whether 'procedures existed for recording solutions to problems or best practice and whether there were any mechanisms by which this knowledge was transferred to other areas of production'. Knowledge was defined in the questionnaire in relation to problem solution or best practice.

A total of fourteen questions elicited this and other relevant information (see page 95 for full details). The variable 'learning mechanisms' was created as an aggregation of these fourteen items. As can be seen, all the items are binary except for the proportion of employees with an explicit responsibility for coaching, which was treated as a percentage with a value between 0 and 1. The aggregation was to have been a sum, except that a few companies had some missing data: therefore a mean was calculated as long as at least eleven of the fourteen items were present. A reliability test showed that Cronbach's

alpha for the items was 0.84, which was satisfactory. This mean was then treated as a 'learning mechanism' score.

#### HR practices

The person primarily responsible for human resource management was first asked to give information about the personnel function; including who had responsibility for personnel matters, how many levels from the Board was this person. He or she was asked how many people were employed in the function (differentiating between professional staff and the total); and what qualifications, if any, were held by members of the personnel department. In relation to personnel strategy, managers indicated whether there was a personnel/HRM strategy and what are the main objectives of personnel over the coming three years. They also outlined what the involvement was of personnel in the development of the most recent corporate strategy and to what extent HR strategy was endorsed by the top management team. Interviewers described what sort of people they felt the company would need in the future and what if anything was being done to ensure that such people were in post. They also indicated whether any form of human resource planning/succession planning was carried out and what was involved in the process. In order to examine other issues to do with succession planning, managers were asked to indicate, whether when filling important posts, recruitment was normally done from within or externally.

In order to verify the responses of managers, interviewers were asked to describe on a scale of 1- 5 the degree of effort put into HRM and the extent to which they regard HR policy as well-planned. On the basis of these questions, interviewers rated the companies on four dimensions: how much effort is put into HRM; how well planned is

the HRM policy; how sophisticated is the HRM policy and how effective HRM policy is overall. These were rated on 5-point scales and the HRM score taken as the mean ( $\alpha = 0.95$ )

#### Training/ induction

The relevant manager was asked whether there was an overall training strategy and if so, what it was; what are the main objectives over the next three years with regard to training; and how training needs of the workforce were assessed. They were also asked to describe current and recent approaches to training in the organization (on a five point scale ranging from 1 - "very reactive, responding as demands arise", through to 5 - "highly planned and organized"). Information was elicited about the current annual training budget, whether this represented an increase or decrease from the previous year, and how well it met the company training needs. Managers were asked to describe the main sorts of training taking place for shop floor, supervisory, clerical - administration, management and other staff. Information was also gathered on whether management development programmes included performance appraisal, annual performance reviews, assessment/development centres, planned job rotation and high-flyer schemes. With regard to induction, they were asked whether a formal induction programme existed, whether the scheme involved a system communicating company values to new employees and whether there was any formal means of evaluating whether induction had been carried out as recommended.

#### Appraisal/ reward

Interviewees indicated whether or not there was a formal appraisal system and if so, who was appraised, how long the scheme had been in operation, and how often

employees were appraised. They were also asked whether appraisers received any formal training, and whether there was a system to monitor whether appraisals had taken place, as they should. Any link between appraisal and remuneration was explored by asking whether such a link existed in relation to four categories of staff: shopfloor, clerical/ administrative, professional/ technical and management.

For all the above variables (training, induction and appraisal), mean scores were created to allow these dimensions to be taken into account in the statistical analysis. So, for example, the mean score used in the study for 'training' is a factor of managerial perceptions of the extent, sophistication and vision of training

#### Control variables

Because the research design was longitudinal, it was possible to control for variables that may otherwise have impacted upon the validity of results. A number of control variables were used for all three of the studies outlined below. Organizational size was measured by taking into account the number of employees working for each organization and was used as a control variable at Time 1. A measurement of organizational performance was taken by looking at published information detailing profitability and again used as a control variable at Time 1. Finally, prior innovation scores were used in order to ascertain the extent to which levels of innovation at Time 2 could be related to a pre-existing condition.

#### Analytical procedure

The purpose of this study was to consider the relationship between the existence of learning mechanisms at Time 2 and innovation in products, production technology and technical systems at Time 3. (As detailed above, the innovation survey was conducted

separately from the rest of the research exercise and responses were received on average around twelve months after the interviews for the main part of the research exercise had been completed). The analytical procedure was to enter the aggregate score for learning mechanisms into a regression, together with control variables. Innovation in products, production technology and technical systems were entered as dependent variables. Where learning mechanisms explained a significant proportion of the variance, t-tests were used in order to establish which of the 14 variables had most effect upon this outcome.

## Results

Means, standard deviations and intercorrelations between the variables are shown in Table 1. The mean score for learning mechanisms is 0.34, on a scale of 0 –1, suggesting that the majority of organizations do not employ a substantial proportion of the learning mechanisms considered in the study. The mean score for the three types of innovation is around 3, with the standard deviation from the norm being slightly higher for innovation in products (1.43) than for the other types of innovation. Significant and positive relationships are found between the existence of learning mechanisms and innovation in production technology ( $r = .58, p < .001$ ) and technical systems ( $r = .65, p < .000$ ).

Turning to Table 2, it can be seen that these relationships hold even where control variables are taken into account. Indeed, product innovation becomes highly significant in Table 2 ( $\beta = .68, p < .001$ ) with the slightly smaller sample size ( $n = 22$  rather than 27). Innovation in technical systems continues to be highly significant ( $\beta = .68, p < .001$ ), and innovation in production technology is significant ( $\beta = .478, p < .05$ ) when

entered into the regression. Table 2 also shows that around 23% of variance for innovation in products and for innovation in production technology is accounted for by the learning mechanisms variable and 41% of the variance for innovation in technical systems is accounted for in this way.

Table 2

Summary of Hierarchical Regression of Product Innovation and Innovation in Technical Systems onto Learning Mechanisms

| Independent variables | Product innovation |              | Innovation in technical systems |         |              |                       |
|-----------------------|--------------------|--------------|---------------------------------|---------|--------------|-----------------------|
|                       | $\beta$            | $\Delta R^2$ | Adjusted $\Delta R^2$           | $\beta$ | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls              |                    | .23          | .10                             |         | .11          | -.04                  |
| Learning mechanisms   | .62**              | .32          | .38                             | .65**   | .37          | .42                   |

p< .05; \*\* p.01; \*\*\* p<.001; n=22

Table 3

Summary of Hierarchical Regression of Innovation in Production Processes and Innovation in Production Technology onto Learning Mechanisms

| Independent variables | Innovation in production processes |              |                       | Innovation in production technology |              |                       |
|-----------------------|------------------------------------|--------------|-----------------------|-------------------------------------|--------------|-----------------------|
|                       | $\beta$                            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                             | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls              |                                    | .11          | -.04                  |                                     | .03          | -.13                  |
| Learning mechanisms   | .24                                | .06          | .10                   | .48*                                | .25          | .23                   |

p< .05; \*\* p.01; \*\*\* p<.001; n=22

Tables 4 and 5 provide insights into what specific learning mechanisms are most significant in predicting innovation. Table 3 shows that two variables from the fourteen reported in the mean learning mechanisms score are positively associated with product innovation. The first measures whether or not a formal procedure exists by which employees meet with their manager to discuss long-term career development (at management and shop-floor level). The mean innovation score for those responding positively when asked this question was 3.69 (3.91 for shop-floor workers), compared to a mean innovation score of 2.21 (2.15 for shop-floor workers) when the response was negative.

Table 3 further reveals that higher levels of product innovation are found within organizations where training is available to employees that is ‘work-related but not directly necessary for an individual’s current job’. This finding applies to management, rather than shop floor employees. Product innovation scores were higher at 3.35 where respondents answered this question positively than where responses were negative (1.89).

Turning to Table 4, which focuses upon innovation in technical systems, the existence of a formal procedure for managing career development is again significant for management (mean innovation scores were 3.50 where such practices existed, as opposed to 2.71 where they did not). Also significant was whether or not organizations had a vision statement referring to the importance of learning (the mean innovation score for those responding positively was 3.34 as opposed to 2.65). Results further suggest that higher levels of product innovation are found in organizations where work-related training is available ‘not necessary for an individual’s current job’ (mean innovation

scores were 3.30 in relation to management and 3.32 in relation to shop-floor workers, as opposed to 2.70 and 2.62 respectively).

Table 4

T- tests showing comparison of the mean for learning mechanisms against product innovation

| Question   | Mean innovation score for those responding 'yes' | Mean innovation score for those responding 'no' |
|--|--|---|
| Is there a formal recognized procedure by which employees meet with their manager to discuss long-term career development?<br>(Management) | 3.69**   | 2.21  |
| Is there a formal recognized procedure by which employees meet with their manager to discuss long-term career development?<br>(Shop-floor) | 3.61**   | 2.15  |
| Is training available to employees that is work-related but not directly necessary for the individuals' current job?<br>(Management)       | 3.35**   | 1.89  |

\* p< .05. \*\* p.01 \*\*\* p<.001  
n=22

(Innovation rated on scale 1- 7)

Table 5

T- tests showing comparison of the mean for learning mechanisms against innovation in technical systems

| Question  | Mean innovation score for those responding 'yes' | Mean innovation score for those responding 'no' |
|---|--|---|
| Do company policies, strategies or vision statements in any way refer to the importance of learning and/ or employee development?       | 3.34*  | 2.65  |
| Is training available to employees that is work-related, but not necessary for individuals' current job? (Management)                   | 3.30   | 2.70  |
| Is training available to employees that is work-related, but not necessary for individuals' current job? (Shop-floor)                   | 3.32*  | 2.62  |
| Is there a formal recognized procedure by which employees meet with their manager to discuss long-term career development? (Management) | 3.50**   | 2.71  |

\*  $p < .05$ . \*\*  $p < .01$  \*\*\*  $p < .001$   
 n=22  
 (Innovation rated on scale 1- 7)

## Discussion

Hypothesis 5 in Chapter 2 stated that where organizations implement all or the majority of the practices described above to manage learning, they will produce relatively high levels of innovation at a later point in time. This proposal is supported through the findings of this study. Even where control variables are taken into account, the relationship between learning mechanisms and innovation continues to be strong.

What is the explanation for these findings? Research suggests that the establishment of a supportive environment for learning is conducive to creativity, learning and innovation. In such an environment, individuals are encouraged to experiment with new ideas, to articulate them without fear of provoking negative reactions from others and to consider actively ways of applying them. Best practice principles suggest that individuals should have the opportunity to engage in career development discussions at regular intervals, to be supported through formal mentoring and coaching arrangements, to experience job rotation and to undertake training which develops new and different skills. As discussed in Chapter 2, literature proposes that a strategic perspective for training and development activity is necessary to ensure that employees are clear about what behaviours are valued and how such behaviours will be rewarded, in financial or other terms. Where such a strategic perspective is concerned with the recording and transfer of knowledge, there is a higher probability that sources of knowledge will be exploited and used to inform practice than would be the case otherwise. The findings of this study provide evidence to support these ideas.

The relationships observed are, however, so striking that that further explanation are required. I argue that learning mechanisms promote organizational, as well as

individual learning. They make it possible for individuals to experience internal variety and to acquire high-level communication and team-working skills. This means that knowledge can be acquired, interpreted, disseminated and enacted. In other words, the study provides evidence to suggest that organizational learning can be managed through the use of the mechanisms described above. This perspective provides support for the theoretical model developed in chapter 2.

In what ways do the learning mechanisms create internal variety? Research suggests that there are two main ways in which it is possible to create internal variety and thus to facilitate the acquisition of knowledge. The first concerns developing understanding of the external environment. A number of sources, referenced in chapter 1, indicate that as greater demands are placed on organizations to change and innovate, so it becomes increasingly important for them to have a range of different receptors able to absorb and interpret knowledge acquired from outside. Internal variety is also created within organizations, through exposing individuals to the different ways of thinking and operating which can be detected across departments and hierarchical levels.

A significant number of the learning mechanisms considered in this study facilitate learning through the creation of internal variety. For example, the study explores whether or not organizations have made provision for interaction with the external environment in order to enable individuals to develop a more informed understanding of the needs of customers and suppliers. Where such mechanisms exist, and where employees take advantage of the opportunities presented for learning in this way, such contact will result in the generation of new and different ideas, thus facilitating the 'intuiting' stage of the organizational learning cycle.

The study also explores whether or not opportunities are presented for knowledge to be acquired internally. Results show that where opportunities are provided for individuals to learn about other jobs, where the company supports learning and training which is not directly work-related, innovation is produced. Findings provide evidence of a strong, positive relationship between the existence of mechanisms designed to provide training over and above what is required for an individual's current job and innovation. Results also suggest that shop floor operators, as well as managers, who experience variety are capable of generating and applying new ideas. This makes sense, since shop-floor workers are immersed in tasks about which management may have little more than a rudimentary knowledge. When shop-floor workers are encouraged to question existing practices, therefore, there is a high probability that they will produce creative ideas.

The process of transferring knowledge requires individuals to put into effect team-working and communication skills. A number of the mechanisms considered in the study are intended to achieve such an outcome. For example, organizations are asked whether or not they have a procedure whereby employees discuss long-term career development with their managers and whether they employ measures to provide coaching and mentoring support to employees. These practices are intended to identify what skills people are expected to be able to exhibit and to provide guidance to employees in terms of how to go about acquiring them. Theory proposes that such practices are underpinned by a commitment at a strategic level to the importance of learning and development. Findings suggest that where organizations endorse a written statement in support of the value of developmental activity, innovation is more likely to be produced.

Results also reveal that the relationship between career development planning and innovation is potentially strong, both for management and shop-floor workers. This is a notable finding for which there are a number of explanations. Firstly, through spending time with their managers engaged in such discussion, employees are likely to believe that they are valued. A number of studies, including the early Hawthorne experiments (see Gillespie, 1991), have shown that receiving attention from perceived authority figures is in itself motivational and linked to improved performance. Secondly, discussion of long-term career development promotes the idea that there is security in the employment relationship. A number of studies have shown that people are more likely to be creative in situations where they feel secure (see West, 2002). Thirdly, regular discussion of career management issues enables individuals to receive feedback on their performance and provides a framework for discussion of the development of skills (Ashton & Felstead, 2001). This allows individuals to become increasingly able to manage their own development and to take advantage of any opportunities presented which are likely to lead to the acquisition of new knowledge or skills (Stern & Sommerlad, 1999).

There are thus strong arguments explaining how internal variety and skill development enhance learning and produce innovation. There are a number of ways in which they have a combined effect upon this outcome. Many of the empirical studies discussed in previous chapters show that there is generally a positive relationship between high levels of task-related autonomy, low organizational controls and creativity. It was suggested that autonomy tends to be a predictor of innovation because it exposes people to new and different experiences. This study explores ways in which organizations can support individuals as they seek to operate more independently. The learning

mechanisms considered above provide a framework enabling individuals to gain knowledge that will increase their competence as potential innovators and also their levels of confidence in this area. In such situations, individuals will be able to use any autonomy that they have to good effect.

A wide range of literature supports this view. Empirical work concerned with the constituent elements of empowerment, for example, regards both competence and self-efficacy as fundamental pre-requisites for such a state (Sprietzer, 1995). Oldham and Cummings (1976) argue that there is a relationship between autonomy and feedback, as well as task variety, identity and significance, and a range of positive performance outcomes. There are frequently significant difficulties surrounding the transfer of learning back into the workplace where formal 'off-the-job' training methods are used. The situated learning perspective argues that people learn most effectively through working closely with the community of practice relevant to their specific area of expertise (c.f. Brown & Duguid, 1991). In addition, knowledge management theorists point to the need to overcome problems associated with 'knowledge stickiness' (Szulanski, 1996) by developing practices to enable best practice ideas, for example, to be shared around the organization in order to improve performance.

For these reasons, there is huge interest in the notion of the workplace as a learning environment, discussed in chapter 2. The learning mechanisms considered in this study create internal variety and develop skills within the context of the immediate work environment. By learning within the context of the work environment, individuals gain knowledge and skills that can be relatively easily transferred and used as a basis to

inform future action. People engage in learning experiences in a way that allows them to conceive of ways in which their new knowledge or improved skills can be applied.

Innovation is much more likely to be produced in these circumstances than in situations where individuals have little opportunity for engaging in development in the ways discussed in this study. One of the conclusions of the study is therefore that substantial benefits will result from adopting an informal, work-related approach to the learning and development process.

This study provides support for best practice ideas to do with the importance of making developmental opportunities available for all levels of the organization. A number of the learning mechanisms explored consider whether or not shop-floor workers are provided with the opportunity to experience variety and to develop skills alongside management staff. Results reveal that there are positive relationships between engagement in such activity at shop floor level and innovation. Such relationships may be explained in terms of the way in which they facilitate the acquisition of ideas and skills in a focused way. In addition, research suggests that knowledge is acquired as employees engage in collaborative dialogue across organizational hierarchies. So the process of developing shop floor staff may result in managers themselves gaining new knowledge and skills as learning is shared in this way.

A number of theoretical implications arise from this study. The literature review reveals that there are few, if any broadly agreed parameters for defining and measuring organizational learning. In addition, there has been little empirical research conducted to ascertain what specific people management practices are likely to have a positive impact upon an organization's capacity to produce innovation. Research evaluating best practice

has tended to focus upon a variety of people management activities significantly related to organizational outcomes such as profitability and productivity. For these reasons, it is important to consider in empirical terms how it may be possible to ascertain whether or not organizations have the capability to learn effectively and the role that people management practices may play in this process.

This study suggests that it is possible to establish whether organizational learning is taking place through assessing the nature and rate of innovation produced. It further proposes that people management practices designed to manage learning will have a positive bearing on such an outcome. This is because the learning mechanisms considered in this study create a framework to support individual and organizational learning. They enable individuals to contribute to the intuiting and interpreting stages of the organizational learning process, and thus enhance creativity. Learning mechanisms also make it more likely that new ideas will become integrated and institutionalized. This is because they provide focus to encourage knowledge sharing, and skills training to support the enactment of knowledge. It is difficult or impossible, however, to measure the contribution of any one mechanism in isolation from another. Research suggests that positive outcomes are unlikely to be achieved unless a number of learning mechanisms are used in conjunction with one another (Ashton & Felstead, 2001; Stern & Sommerlad, 1999). This study provides evidence in favour of such an approach.

The study also has a number of implications for practitioners. The mechanisms described above are based on the theoretical premise that the workplace itself is a powerful learning environment and that any knowledge acquired is likely to be relatively easily transferred from the individual to the work-group and used as a basis to inform and

improve practice. Therefore, employee development practitioners need to consider ways in which they can use opportunities occurring in the workplace as a basis for learning. They also need to consider how to ensure that those with responsibility for developing skills- coaches, mentors and line managers- are themselves capable of supporting staff in this way. People management practices have the potential to make a difference to the value that is attached to the developmental process- both in relation to the learner and also with regard to those responsible for supporting development. Furthermore, people management activities can help to create a climate whereby individuals feel that they can put forward proposals for new ideas without being penalized for doing so. Employee development and other people management practitioners have a responsibility for creating a climate that enables people who are exposed to new experiences and perspectives to articulate their knowledge and to gain support for its enactment.

### Conclusion

I suggested in the first two chapters that people management practices have an important role to play in creating the framework necessary to facilitate organizational learning. Firstly, I argued that in order to be creative, individuals should be exposed to new and different experiences. A number of the learning mechanisms considered in the study enable individuals to experience internal variety in this way- for example, practices requiring people to work in a different part of the organization for a period of time. Secondly, a proposal was made that any mechanisms designed to facilitate the development of team working and communication skills would increase organizational learning. This is because individuals are more likely to enact new knowledge where they are engaged in collaborative dialogue with one another, and such engagement can only

happen where high-level interpersonal skills are manifest. Support has been found for these theoretical ideas through this study.

There are some methodological difficulties associated with the study, which have not been entirely resolved. Sample sizes are small and this means that any conclusions drawn are necessarily tentative, requiring further empirical support. The approach adopted focuses upon observed relationships between learning mechanisms and innovation. Although using control variables makes it more likely that the variance identified can be attributed to the predictors considered in the study, it is impossible to rule out the possibility that other variables that have not been measured explain innovation, rather than the learning mechanisms. For example, this study does not consider what impact employee involvement programmes may have upon organizational propensity to innovate. In addition, the statistical tools do not allow for the assertion of causal relationships, and one can only infer that such relationships may exist.

A number of points can be made to mitigate the impact of such limitations. Firstly, although the sample size is small, the trends observed are significant or very significant, suggesting that it is reasonable to draw valid inferences from the study. Secondly, longitudinal data has been employed. This means that it has been possible to control for the effect of variables that have a potential role in shaping the reported outcomes. So, for example, it has been possible to control for prior innovation. This is a robust control that considerably strengthens the argument put forward in favour of the positive relationship between learning mechanisms and innovation. Thirdly, data measuring rates and levels of innovation are drawn from sources that are distinct and separate from those which form the basis of the learning mechanism score. This suggests

that more weight can be attached to conclusions deriving from the relationships than would be the case where data for dependent and independent variables are derived from the same source. The methodological limitations and strengths discussed here are similar for chapters 5 and 6.

There are other variables that have not been considered in this study, which nonetheless are central to our argument that people management practices have an important role to play in making organizational learning happen. For example, the study does not consider the way in which people management practices such as appraisal may act upon the process. Neither does the study specifically identify the relative importance of mechanisms designed to promote variety as opposed to those intended to develop skills. It is therefore difficult to show that both sets of mechanisms must be present to achieve the positive outcomes proposed, and whether there is any interaction effect between their joint use.

These limitations are to a considerable extent addressed by the following studies. The next chapter considers the extent to which HR activities at a strategic and operational level predict innovation, and why. Chapter 6 explores whether mechanisms designed to facilitate the generation of variety have a stronger effect on innovation than those intended to develop skills, and whether or not there is an interaction effect between the use of these groups of mechanisms. The aim is to develop a holistic model explaining the relationship between people management practices, organizational learning and innovation. The conclusions derived from this study represent the first stage in developing a clearer understanding of these relationships.

## CHAPTER 5

### HR practices at strategic and operational levels and innovation

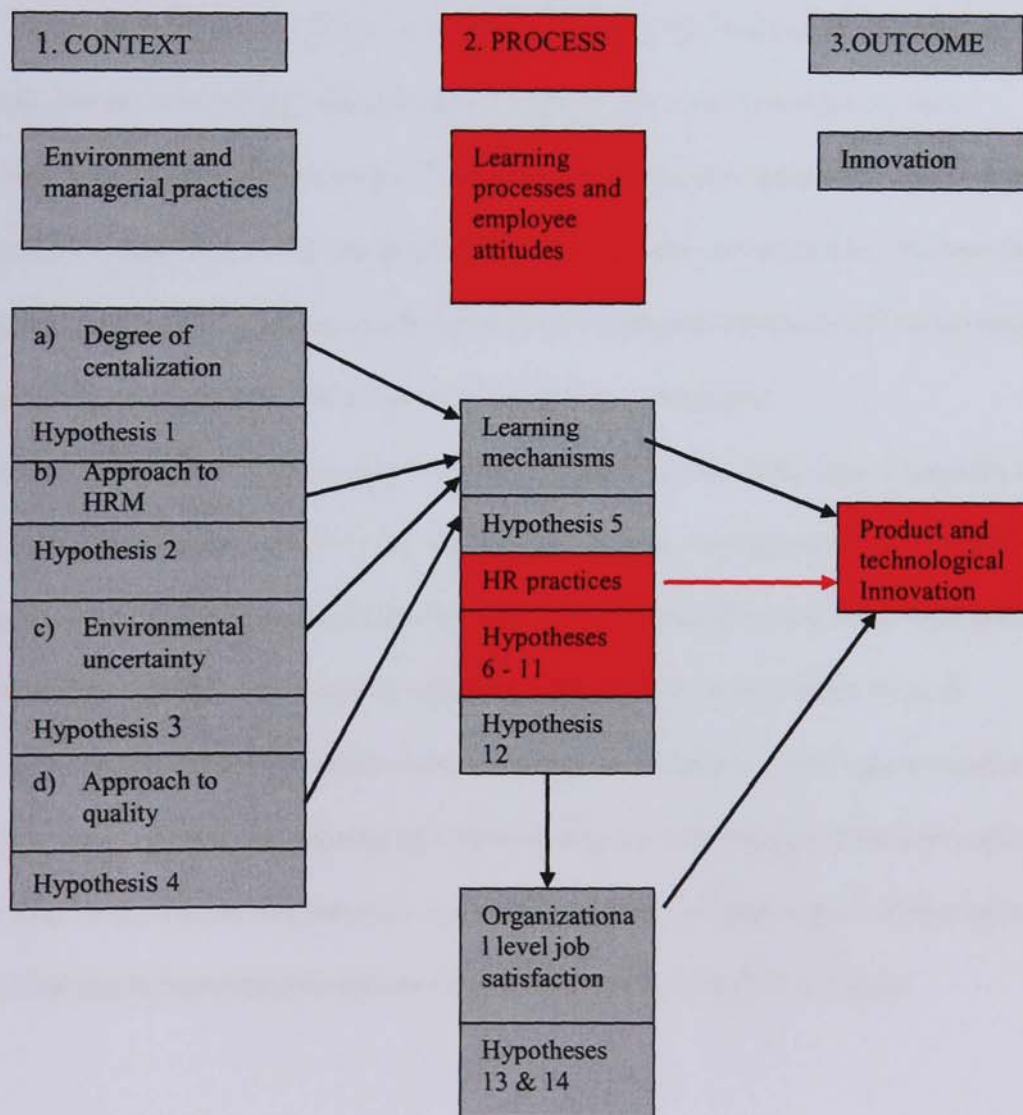
#### Introduction

The purpose of this study is to build upon the findings derived from the previous study and to consider in more detail the relationship between people management practices, organizational learning and innovation. Whilst Chapter 4 explored how mechanisms associated with human resource development practice impacted upon innovation, this chapter assesses the effect of a broader range of people management practices upon this outcome. The theoretical argument is that learning mechanisms promote organizational learning primarily because they create internal variety. HR practices at both strategic and operational level have this effect because they provide focus and support for the development of skills. So the learning mechanisms influence the intuiting and interpreting stages of the organizational learning process, whilst the HR practices shape the interpreting and institutionalizing stages.

The methodological approach adopted is as described in the previous chapter. The study considers, firstly, whether there is a relationship between HR practice at operational level and innovation and, secondly whether the existence of a coherent and well-articulated HR strategy impacts positively upon this outcome. The theoretical rationale for this approach is supported by a number of authors who have proposed that it is possible to draw a distinction between strategic and operational level HR activity (For example, Huselid, Jackson & Schuler, 1997). The study considers variables related to operational level HR

activity. Measures are developed for appraisal, training, and induction and also take into account the extent to which appraisal is linked to remuneration. Two aspects fundamental to the effectiveness and application of HR strategy are considered – the extent to which human resource planning is employed and whether or not senior management endorses HR strategy.

### Model guiding the research



## Method

The study draws upon the CEP data set described in chapter 3 and referred to in depth in both chapters 3 and 4. In the last chapter, I made reference to a sample size of twenty-two. Seventeen of the same organizations are included in the sample for this study. I have for this study drawn upon a further thirteen organizations for which there is information about people management at strategic and operational level. I am therefore able to draw upon a larger sample size of thirty.

I described in chapter 4 how we arrived at a score for innovation in products, technical systems, technology and processes. In brief, the innovation survey was conducted by post and was completed by between four and five technical experts at each organization as appropriate for the innovation domain under investigation. It consisted of open questions and rating scales in relation to new or adapted products and technological innovation (innovations in production technology and production techniques/procedures). Each section was given an innovation rating on a five-point scale from 1 'not at all innovative' to 7 'very innovative'. These were based on the types of change introduced, their magnitude and novelty and the impact on the workforce and the manufacturing process. An overall innovation rating was given by raters to each company. A variety of mechanisms were employed to validate the findings, as outlined in Chapter 4. For example, the scoring of technical experts was correlated against employee perceptions of the climate for innovation and the ensuing analysis suggested that there was a close match between perceptions of management and staff in this area.

I give below details of how we operationalized the independent variables of this study at operational and strategic level.

**Operational-level people management:** In order to measure appraisal, interviewers asked respondents 'Is there a formal appraisal scheme?' This yes/no response was used as basis for the appraisal measure. The measure for training was calculated by taking into account interviewer perceptions of the sophistication, extensiveness and planning of training and recording an average score on a five-point scale. Induction was also measured by analyzing interviewer perceptions on a five-point scale, ranging from: 1- 'none at all', through to five: - 'excellent with careful planning'.

**Strategic-level people management:** Two questions elicited data about strategic-level people management. We asked Personnel or HR Directors 'Do you have a formal HR strategy endorsed by the top management team?' Interviewers were instructed on the questionnaire schedule to record a positive response only where a written strategy document was available. Secondly, interviewers gave their own ratings of HR and its strategic integration. They recorded on a five point scale their perceptions of 'how well planned is the HRM policy.' This score also formed the basis for analysis of strategic commitment.

#### Analytical procedure

The analytical approach was to enter both strategic and operational level variables separately into a regression, with innovation in products, technological innovation, technology and processes as dependent variables. Control variables were used from Time 1 in order to take account of prior levels of innovation,

company size and profitability. HR variables were measured at a second point in time and innovation was measured at a third point in time. In addition, I input appraisal, training and induction jointly into a regression to establish which of these variables had the strongest relationship with the dependent variables.

It became evident in the course of the analysis that there was a statistically very significant relationship between training and innovation in technical systems and human resource planning and the same outcome. In view of this, I conducted further analysis to explore the extent to which there was an interaction effect between these two variables.

## Results

Means, standard deviations and intercorrelations between the variables are presented in Table 1. Statistically significant relationships can be observed between the existence of a formal appraisal scheme and innovation in products and technical systems ( $r = .43, p < .05$  and  $r = .37, p < .05$ ). This is also the case for the variable measuring training and innovation in products and technical systems ( $r = .46, p < .05$  and  $r = .56, p < .005$ ). Similar patterns are observed between the measure of induction and product innovation, technical systems and production processes ( $r = .44, p < .05, r = .48, p < .01$  and  $r = .41, p < .05$  respectively).

There is a statistically significant correlation between the existence of an HR strategy endorsed by the senior management team and innovation in products, technical systems and production technology ( $r = .45, p < .05, r = .43, p < .05$  and  $.38, p < .05$  respectively). There is also a significant relationship

between degree of planning manifested in HRM and innovation in products and in technical systems ( $r = .44, p < .05$ ,  $r = .44, p < .05$ ).

There are highly significant relationships between the degree of planning in HRM and measures of appraisal, training and induction ( $r = .39, p < .05$ ,  $r = .54, p < .005$  and  $r = .64, p < .005$  respectively). There are also strong and positive relationships between the existence of an HR strategy endorsed by top management and the degree of planning of HRM ( $r = .63, p < .005$ ), the existence of a formal appraisal scheme ( $r = .39, p < .05$ ), training ( $r = .54, p < .005$  and induction ( $r = .64, p < .005$ ). In other words, if HR strategy is endorsed by senior management, organizations are more likely to have in place measures designed to manage performance.

Tables 2 and 3 show that the relationships presented in Table 1 are generally supported in regression analyses, taking into account variance accounted for by the control variables. It can be seen that the variable measuring the existence of a formal appraisal scheme is a significant predictor of product innovation ( $\beta = .42, p < .01$ ) and innovation in technical systems ( $\beta = .42, p < .05$ ). The variable measuring appraisal accounts for 17 % and 14% respectively of the variance in product innovation and innovation in technical systems. These findings present substantial support for Hypothesis 6, that organizations that employ sophisticated appraisal practices will manifest relatively high levels of product and technological innovation at a later point in time.

Table 1

## Means, Standard Deviations and Correlations for all Study Variables

| T3                                       | Mean | SD   | 1     | 2     | 3    | 4    | 5     | 6     | 7    | 8     |
|--|------|------|-------|-------|------|------|-------|-------|------|-------|
| 1. Product innovation                    | 2.95 | 1.37 |       |       |      |      |       |       |      |       |
| 2. Innovation in technical systems       | 3.20 | .88  | .77** |       |      |      |       |       |      |       |
| 3. Innovation production technology      | 2.82 | 1.35 | .45*  | .66** |      |      |       |       |      |       |
| 4. Innovation production processes       | 3.32 | 1.28 | .28   | .66** | .13  |      |       |       |      |       |
| T2                                       |      |      |       |       |      |      |       |       |      |       |
| 5. HR strategy endorsed by top mgt. Team | .37  | .49  | .45*  | .43*  | .38* | .27  |       |       |      |       |
| 6. Degree of planning in HRM             | 3.03 | .96  | .44*  | .46*  | .29  | .30  | .63** |       |      |       |
| 7. Appraisal                             | .67  | .48  | .43*  | .37*  | .27  | .08  | .39*  | .47** |      |       |
| 8. Training                              | 3.10 | .76  | .46*  | .56** | .35  | .33  | .54** | .83** | .37* |       |
| 9. Induction                             | 3.52 | .87  | .44*  | .48** | .21  | .41* | .64** | .68** | .22  | .68** |

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ;  $n=30$

Table 2

Summary of Hierarchical Regression of Product Innovation and Innovation Technical Systems onto Appraisal, Training and Induction

| Independent variables | Product innovation |              |                       | Innovation in technical systems |              |                       |
|-----------------------|--------------------|--------------|-----------------------|---------------------------------|--------------|-----------------------|
|                       | $\beta$            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                         | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls<br>Appraisal | .42**              | .32          | .24                   | .42*                            | .15          | -.03                  |
|                       |                    | .17          | .17                   |                                 | .20          | .14                   |
| Controls<br>Training  | .31*               | .32          | .24                   | .58**                           | .10          | -.03                  |
|                       |                    | .11          | .13                   |                                 | .45          | .30                   |
| Controls<br>Induction | .28                | .32          | .24                   | .47*                            | .07          | -.03                  |
|                       |                    | .05          | .02                   |                                 | .19          | .13                   |

\*p< .05; \*\* p.01; \*\*\* p<.001; n=30

Table 3

Summary of Hierarchical Regression of Innovation in Production Processes and Innovation in Production Technology onto Appraisal,

Training and Induction

| Independent variables | Innovation in production processes |              |                       | Innovation in production technology |              |                       |
|-----------------------|------------------------------------|--------------|-----------------------|-------------------------------------|--------------|-----------------------|
|                       | $\beta$                            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                             | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls Appraisal    | .29                                | .10<br>.05   | -.01<br>-.02          | .29                                 | .02<br>.06   | -.09<br>-.05          |
| Controls Training     | .39*                               | .10<br>.15   | -.01<br>.12           | .39*                                | .02<br>.10   | -.09<br>.13           |
| Controls Induction    | .43*                               | .10<br>.17   | -.01<br>.15           | .23                                 | .02<br>.05   | -.09<br>.01           |

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ;  $n = 30$

Turning to tables 4, 5, and 6, there are negative relationships between the existence of an appraisal scheme linked to remuneration and most types of innovation. Table 4 reveals statistically significant negative relationships between appraisal linked to remuneration for professional and technical staff and management where these scores are correlated against innovation in technical systems. ( $r = -.45, p < .05$ ;  $r = -.45, p < .05$  for both relationships). Similar trends are detected for innovation in production processes.

Tables 4 and 5 present evidence to suggest that these relationships hold where control variables are taken into account when innovation in production processes is the outcome variable considered, for professional and technical employees, for management and for clerical and administrative staff ( $\beta = -.41, p < .05$ ,  $\beta = -.42, p < .05$  and  $\beta = -.42, p < .05$  respectively). This variable accounts for around 15% of the variance for innovation in production processes for all three categories of staff. Relationships between appraisal linked to remuneration and product innovation and innovation in technical systems for the same three categories of staff are also negative. These findings provide support for Hypothesis 7, that organizations that link appraisal to pay at one point in time will produce relatively low levels of product and technological innovation at a later point.

Means, Standard Deviations and Intercorrelations for Appraisal linked to Remuneration and Innovation

|   | Mean | SD   | 1.    | 2.    | 3.    | 4.   | 5.    | 6.      |
|---|------|------|-------|-------|-------|------|-------|---------|
| 1. Product innovation                                       | 3.31 | 1.46 |       |       |       |      |       |         |
| 2. Innovation technical systems                             | 3.33 | 1.95 | .84** |       |       |      |       |         |
| 3. Innovation in production processes                       | 3.33 | 1.24 | .44*  | .14   |       |      |       |         |
| 4. Innovation in production technology                      | 2.92 | 1.46 | .46*  | .66** | .14   |      |       |         |
| 5. Clerical/administrative appraisal linked to remuneration | .24  | .44  | -.23  | -.36  | -.49* | .11  |       |         |
| 6. Professional/technical appraisal linked to remuneration  | .29  | .46  | -.38  | -.45* | -.46* | -.04 | .88** |         |
| 7. Management appraisal linked to remuneration              | .29  | .46  | -.38  | -.45* | -.46* | -.04 | .88** | 1.00*** |

\*  $p < .05$ ; \*\* $p < .01$ ; n= 22

# Summary of Hierarchical Regression of Product Innovation and Innovation in Technical Systems onto Appraisal Linked to

## Remuneration for Managerial, Professional and Technical and Clerical and Administrative Staff

| Independent variables  | Product innovation |              |                       | Innovation in technical systems |              |                       |
|--|--------------------|--------------|-----------------------|---------------------------------|--------------|-----------------------|
|  | $\beta$            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                         | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls   |                    |              |                       |                                 |              |                       |
| Appraisal linked to remuneration for managerial staff                  | -.28               | .41<br>.05   | .30<br>.03            | -.29                            | .10<br>.08   | -.06<br>-.03          |
| Controls   |                    |              |                       |                                 |              |                       |
| Appraisal linked to remuneration for professional and technical staff  | -.29               | .41<br>.08   | .30<br>.05            | -.37                            | .10<br>.18   | -.06<br>-.04          |
| Controls   |                    |              |                       |                                 |              |                       |
| Appraisal linked to remuneration for clerical and administrative staff | -.26               | .35<br>.06   | .22<br>.03            | -.26                            | .11<br>.10   | -.06<br>.05           |

\*p< .05; \*\* p.01; \*\*\* p<.001; n=22

Summary of Hierarchical Regression of Innovation in Production Processes and Innovation in Production Technology onto Appraisal  
Linked to Remuneration for Managerial, Professional and Technical and Clerical and Administrative Staff

| Independent variables  | Innovation in production processes |              |                       | Innovation in production technology |              |                       |
|--|------------------------------------|--------------|-----------------------|-------------------------------------|--------------|-----------------------|
|  | $\beta$                            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                             | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls   |                                    |              |                       |                                     |              |                       |
| Appraisal linked to remuneration for managerial staff                  | -.41*                              | .28          | .15                   | .04                                 | .07          | .07                   |
|  |                                    | .16          | .15                   |                                     | .00          | .00                   |
| Controls   |                                    |              |                       |                                     |              |                       |
| Appraisal linked to remuneration for professional and technical staff  | -.42*                              | .28          | .15                   | -.01                                | .07          | -.10                  |
|  |                                    | .16          | .14                   |                                     | .00          | -.07                  |
| Controls   |                                    |              |                       |                                     |              |                       |
| Appraisal linked to remuneration for clerical and administrative staff | -.42*                              | .28          | .14                   | .02                                 | .08          | -.10                  |
|  |                                    | .17          | .16                   |                                     | .00          | -.07                  |

\*p< .05; \*\* p.01; \*\*\* p<.001; n=22

Table 6

## Summary of Hierarchical Regression of Innovation in Production Processes and Innovation in Production Technology onto Appraisal

## Linked to Remuneration for Managerial, Professional and Technical and Clerical and Administrative Staff

| Independent variables  | Innovation in production processes |              |                       | Innovation in production technology |              |                       |
|--|------------------------------------|--------------|-----------------------|-------------------------------------|--------------|-----------------------|
|  | $\beta$                            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                             | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls   |                                    | .28          | .15                   |                                     | .07          | .07                   |
| Appraisal linked to remuneration for managerial staff                  | -.41*                              | .16          | .15                   | .04                                 | .00          | .00                   |
| Controls   |                                    | .28          | .15                   |                                     | .07          | .10                   |
| Appraisal linked to remuneration for professional and technical staff  | -.42*                              | .16          | .14                   | -.01                                | .00          | -.07                  |
| Controls   |                                    | .28          | .14                   |                                     | .08          | .10                   |
| Appraisal linked to remuneration for clerical and administrative staff | -.42*                              | .17          | .16                   | .02                                 | .00          | -.07                  |

\*p&lt; .05; \*\* p.01; \*\*\* p&lt;.001; n=22

Moving back to Tables 2 and 3, significant positive relationships are found between the variable measuring induction and innovation in technical systems ( $\beta = .47, p < .05$ ) and innovation in production processes ( $\beta = .43, p < .05$ ). Around 15% of the variance for innovation in technical systems and for innovation in production processes is accounted for in this way. There are significant relationships between the extent and sophistication of training and all four types of innovation ( $\beta = .31, p < .05$  for product innovation ( $\beta = .58, p < .005$ ), for innovation in technical systems ( $\beta = .39, p < .05$ ), for innovation in production processes ( $\beta = .39, p < .05$ ) and for innovation in production technology. Training accounts for 30% of the variance in innovation in technical systems and around 13% of the variance in the other three types of innovation. I thus find support for hypotheses 8 and 9. Hypothesis 8 states that there will be a positive relationship between the existence of an effective induction process at one point in time and innovation at a later point. Hypothesis 9 holds that this relationship will apply for organizations which employ sophisticated training practices.

Moving on to the strategic level variables, there are significant, positive relationships between strategy endorsed by the senior management team and innovation in technical systems and innovation in production technology ( $\beta = .48, p < .05$  and  $\beta = .43, p < .05$  respectively). Tables 7 and 8 further reveal that this variable accounts for 20% of the variance in innovation in technical systems and 16% of the variance in innovation in production technology. There is a highly

significant positive relationship between the degree of planning of HRM and innovation in technical systems ( $\beta = .54, p < .005$ ), with this variable accounting for 26% of the variance in innovation in technical systems (detailed in tables 9 and 10). The relationship between the variable measuring HR planning and innovation in production processes is also significant ( $\beta = .43, p < .05$ ), with 15% of the variance being accounted for in this way. Support is thus presented for hypotheses 10 and 11, which argue respectively that organizations which adopt a strategic approach to human resource planning, and whose senior members endorse HR activity, are likely to produce relatively high levels of product and technological innovation.

Table 7

Summary of Hierarchical Regression of Product Innovation and Innovation in Technical Systems onto HR Strategy Endorsed By

Senior Management

| Independent variables                          | Product innovation |              |                       | Innovation in technical systems |              |                       |
|--|--------------------|--------------|-----------------------|---------------------------------|--------------|-----------------------|
|  | $\beta$            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                         | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls                                       |                    | .32          | .24                   |                                 | .07          | -.03                  |
| HR strategy endorsed by senior management team | .50                | .10          | .08                   | .48*                            | .21          | .20                   |

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ;  $n = 30$

Table 8

Summary of Hierarchical Regression of Innovation in Production Processes and Innovation in Technical Systems and Innovation in Production Technology onto HR Strategy endorsed by Senior Management Team

| Independent variables                          | Innovation in production processes |              |                       | Innovation in production technology |              |                       |
|--|------------------------------------|--------------|-----------------------|-------------------------------------|--------------|-----------------------|
|  | $\beta$                            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                             | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls                                       |                                    | .02          | -.04                  |                                     | .02          | -.09                  |
| HR strategy endorsed by senior management team | .35                                | .07          | .09                   | .43*                                | .18          | .16                   |

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ;  $n = 30$

Table 9

Summary of Hierarchical Regression of Product Innovation and Innovation in Technical Systems onto Degree of Planning of HR

| Independent variables | Product Innovation |              |                       | Innovation in technical systems |              |                       |
|-----------------------|--------------------|--------------|-----------------------|---------------------------------|--------------|-----------------------|
|                       | $\beta$            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                         | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls              |                    | .32          | .24                   |                                 | .074         | -.03                  |
| HR planning           | .29                | .07          | .05                   | .54**                           | .27          | .27                   |

\*p< .05; \*\* p.01; \*\*\* p<.001; n=30

Table 10

Summary of Hierarchical Regression of Innovation in Production Processes and Innovation in Production Technology onto Degree of

Planning of HR

| Independent variables    | Innovation in production processes |              |                       | Innovation in production technology |              |                       |
|--------------------------|------------------------------------|--------------|-----------------------|-------------------------------------|--------------|-----------------------|
|                          | $\beta$                            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                             | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls                 |                                    | .10          | -.01                  |                                     | .03          | -.09                  |
| Degree of planning in HR | .43*                               | .17          | .15                   | .37                                 | .13          | .16                   |

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ;  $n = 30$

Finally, whilst this was not the subject of a formal hypothesis, results suggest that human resource planning and training together explain a higher proportion of the variance for innovation in technical systems than is the case when each variable is input separately. As table 11 shows, the interaction between training and human resource planning explains 9% of the variance for innovation in technical systems ( $\beta = .40$ ,  $p < .054$ ). Furthermore, whilst again this was not the subject of a formal hypothesis, when appraisal, training and induction were entered jointly into a regression, table 13 reveals that appraisal is the only significant variable for product innovation ( $\beta = .45$ ,  $p < .05$ ). This finding does not apply to the other types of innovation considered.

Table 11

Summary of Hierarchical Regression of Product Innovation and Innovation in Technical Systems onto training, HR planning and

Training X HR Planning

| Independent variables  | Product innovation |              |                       | Innovation in technical systems |              |                       |
|------------------------|--------------------|--------------|-----------------------|---------------------------------|--------------|-----------------------|
|                        | $\beta$            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                         | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls               |                    | .40          | .28                   |                                 | .30          | .11                   |
| Training               | -.15               | .16          | .11                   | -.16                            | .15          | .10                   |
| HR planning            | .34                | .17          | .12                   | .55                             | .20          | .11                   |
| Training X HR planning | .33                | .15          | .09                   | .40*                            | .45          | .09                   |

\*  $p < .05$ ; \*\*  $p < .01$ ;  $n = 30$

Table 12

Summary of Hierarchical Regression of Innovation in Production Processes and Innovation in Production Technology onto training,

HR planning and Training X HR Planning

| Independent variables  | Innovation in production processes |              |                       | Innovation in production technology |              |                       |
|------------------------|------------------------------------|--------------|-----------------------|-------------------------------------|--------------|-----------------------|
|                        | $\beta$                            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                             | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls               |                                    | .10          | -.06                  |                                     | .05          | -.60                  |
| Training               | -.11                               | .15          | -.50                  | -.11                                | .10          | -.50                  |
| HR planning            | -.60                               | .25          | .14                   | -.60                                | .25          | .15                   |
| Training X HR planning | .02                                | .20          | -.18                  | .02                                 | .05          | -.59                  |

\*  $p < .05$ ; \*\* $p < .01$ ;  $n = 30$

Table 13

Summary of Hierarchical Regression of Product Innovation and Innovation in Technical Systems onto appraisal, training and induction

induction

| Independent variables           | Product innovation |              |                       | Innovation in technical systems |              |                       |
|---------------------------------|--------------------|--------------|-----------------------|---------------------------------|--------------|-----------------------|
|                                 | $\beta$            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                         | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls                        |                    | .36          | .28                   |                                 | .11          | .01                   |
| Appraisal                       | .45*               |              |                       | .26                             |              |                       |
| Training                        | .38                |              |                       | .34                             |              |                       |
| Induction                       | .36                |              |                       | .20                             |              |                       |
| Appraisal, Training & Induction |                    | .19          | .15                   |                                 | .36          | .32                   |

\*  $p < .05$ ; \*\* $p < .01$ ;  $n = 30$

Summary of Hierarchical Regression of Innovation in Production Processes and Innovation in Production Technology onto appraisal, training and induction

| Independent variables           | Innovation in production processes |              |                       | Innovation in production technology |              |                       |
|---------------------------------|------------------------------------|--------------|-----------------------|-------------------------------------|--------------|-----------------------|
|                                 | $\beta$                            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                             | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls                        |                                    | .01          | -.11                  |                                     | .01          | -.11                  |
| Appraisal                       | .61                                |              |                       | .26                                 |              |                       |
| Training                        | .50                                |              |                       | .34                                 |              |                       |
| Induction                       | .42                                |              |                       | .20                                 |              |                       |
| Appraisal, Training & Induction |                                    | .15          | -.05                  |                                     | .17          | -.07                  |

\*  $p < .05$ ; \*\* $p < .01$ ;  $n = 30$

## Discussion

Results suggest that HR practices at an operational and strategic level are important predictors of innovation. These findings provide substantial, but not complete, support for hypotheses 6 - 11, detailed in chapter 2. The variable measuring endorsement of HR strategy by the senior management team is significantly related to innovation in technical systems and innovation in production technology. There are significant relationships between the degree of planning in HRM and innovation in technical systems and innovation in production processes.

Why is there not a more universal effect across all types of innovation? Neither strategic-level variable appears to impact upon product innovation, for example. Perhaps strategic level variables are more likely to impact upon organizational outcomes where they are employed in conjunction with lower-level, operational practices. I found some support for this possibility in the study (for example, the interaction effect between human resource planning and training detailed in Table 11). It is, however, probably the case that people have more direct influence over other types of innovation- in technical systems, technology and processes. Perhaps, given that there is high level support for the general notion of innovation, they can devise ways of innovating in these domains without needing as much support and feedback through mechanisms such as training and appraisal.

There are many reasons why strategic-level people management has the potential to impact upon innovation. People management at strategic level will define and specify what skills are required in order to facilitate the achievement of organizational goals. One of the major objectives of human resource planning, for example, is to look

ahead at where the business is going (to conduct ‘demand planning’) and to establish what skills will be required to enable the business to achieve its objectives (‘supply planning’). Where an organization is making a conscious effort to increase the creativity of its members, and where such a goal is reflected in its the strategic focus, one would expect to see higher levels of innovation than would be the case otherwise. This assertion is borne out by the findings of this study. Results show that there is a strong and positive relationship between the degree of planning in HRM and innovation – specifically, innovation in technical systems and production processes.

Many sources, detailed below, argue that a critical variable determining the impact of HR strategy concerns the extent to which it is endorsed by the senior management team. Widespread support at a high level for a strategic people management framework increases the probability that such a framework takes into account organizational objectives and priorities, meaning that it is likely to be a more comprehensive and informed plan than would be the case without such support (Sparrow & Marchington, 1998; Storey, 2001). It also means that any strategy devised will be effectively communicated and its implementation monitored (Bramham, 1996; Noe, Hollenbeck, Gerhart & Wright, 1994). Results support such an interpretation of the importance of senior level support for HR strategy. In addition, it seems reasonable to assume from data presented in Table 1 that senior level support for HR strategy determines to a large extent whether or not organizations adopt operational practices designed to develop skills in the first place. There are strong and positive intercorrelations between the strategic dimensions of HR activity –the extent to which HR strategy is endorsed by top management and the degree of planning in HRM- and

measures of training, appraisal and induction. A strategic framework increases the probability that adequate resources will be made available to support people management activity, establishes how performance will be measured and what rewards will be made available to those judged to be working in accordance with specified standards. People management practices are likely to be more effectively integrated with one another and more closely linked with business goals where they have been devised in accordance with a widely agreed strategic framework.

The patterns of results show that induction, training and appraisal are important predictors of innovation. Substantial, but not full, support is thus provided for hypotheses 7, 8 and 9 detailed above. As was the case for the strategic-level variables, training and induction are not positively associated with product innovation. The explanation for this is probably similar- it is more difficult for individuals to make a difference to this type of innovation. Perhaps training alone is not sufficient to generate sustained product innovation. Interestingly, there is a significant, positive relationship between appraisal and product innovation. The rationale for this relationship is discussed below in more depth.

As a general rule, findings suggest that operational HR practices positively predict innovation in technical systems, technology and processes. Such activities provide focus for the development of communication and team-working skills. People are encouraged to learn and to share their knowledge with others. This is in line with other studies; for example, Argote and Epple (1999) show how a focus on training leads to knowledge being transferred more efficiently from one part of the organization to another, with measurable improvements in organizational performance arising from this.

A number of operational HR practices facilitate the skill development process. Firstly, induction has this effect. The strong, positive relationships between the variable measuring induction and innovation in technical systems and production processes shown in Table 3 suggests that induction plays a more important part in determining whether or not innovation is produced than has previously been recognized. Whilst there is little, if any empirical work concerning the relationship between induction and innovation, it is possible to argue that an effective induction serves a number of purposes. Perhaps induction clarifies expectations between employer and employee and creates enthusiasm for the challenges and opportunities implicit in the job itself. This may foster intrinsic motivation, an approach to work which is generally believed to be helpful for creativity and innovation (Amabile, 1988; Amabile et.al., 1996). It may bring new recruits into contact with existing employees able to provide mentoring help and support during the early stages of an individual's career. Possibly also induction introduces people to the wider community of practice and increases understanding of how they can contribute to learning and innovation (Brown & Duguid, 1991; Miller & Dollard, 1975). Furthermore, from a different perspective, perhaps organization vary in the extent to which they make enable new recruits to have an impact upon existing ways of operating. New recruits bring valuable new knowledge into the organization. Such knowledge needs to be articulated before it is forgotten or superseded (Simon, 1991). Where new entrants are encouraged to articulate the knowledge that they bring, existing employees are exposed to different ways of thinking and operating which can be powerful drivers for change and innovation. For these reasons, it is important to consider carefully what individuals need to know when they join the organization and how can

such knowledge be communicated most effectively. It also makes sense to consider what opportunities new recruits will have to set objectives and share knowledge.

Data presented in Table 3 show that there are also strong and positive relationships between appraisal and product innovation/ innovation in technical systems. Table 13 provides further insight into the importance of having an appraisal scheme. Entered into a regression with the other HR variables, appraisal emerges as the most significant predictor of product innovation, over and above training and induction. There are a number of explanations for this relationship. Firstly, a well-conducted appraisal interview will bring together both individual and organizational goals and provide a clearer view of what performance outcomes will be valued and supported. This is important in terms of providing clarification about how best to direct effort. Substantial research has shown that individuals and teams perform better where they have clear goals (Guzzo & Bondy, 1983). This is particularly the case in situations where organizations seek to produce innovation, possibly because such clarity increases the probability that new ideas are put into practice. Research shows that external pressure- provided in this case by the expectations of the wider organization- is particularly important in facilitating the application of new ideas (West, 2002). In addition, clear focus provides the impetus for individuals to make effective use of any developmental opportunities and encourages them to think about ways of applying knowledge (Campion, Pepper & Medsker, 1996). It also provides a rationale for the development of communication and team-working skills (Dixon, 1994; Kim, 1991; Nonaka & Takeuchi, 1995). Where goals set require individuals to contribute to team performance, for example, it is clear that they will be required to articulate and

disseminate their knowledge with others and to respond supportively to the views of other people. Such an approach promotes organizational learning and the production of innovation.

As well as providing focus and direction for effort, the appraisal process provides feedback to individuals on their performance to date. A number of theories, reviewed in chapter 2, point to the centrality of feedback in determining how well people learn and perform (Amabile (1984; Erez, 1977; Locke & Latham, 1990). Feedback provides guidance to individuals about what particular aspects of performance have been perceived as desirable and prompts reflection about experiences that have not been positive. Feedback may play an important role in enabling individuals to move through an 'experiential learning cycle', (e.g. Kolb, 1985) whereby they reflect upon experiences, draw upon any additional knowledge required to improve performance and use any further experiences which arise as opportunities for development. In this way, feedback fosters greater self-knowledge, so that, within a framework of autonomy, tasks can be taken on which are perceived to be appropriate for skills and personal attributes.

The immediate line manager conducts most appraisal interviews, and there is a strong argument to suggest that feedback from such a source is of particular value (Carlton & Sloman, 1992; Stiles, Gratton, Truss, Hope-Hailey & McGovern, 1997). The line manager is acquainted with tasks and is aware of particular challenges faced (Bowles & Coates, 1993). S/he is able to provide reward to individuals for perceived high performance- either in terms of pay or in terms of recognition or opportunities for future development. In addition, the line manager is in a strong position to provide individuals with support as they engage in new experiences and commit themselves to

learning and development. There is substantial evidence within the training transfer literature to indicate that developmental experiences which do not involve the line manager fail to deliver significant lasting benefits to the organization (e.g. Shipton & Shackleton, 1998).

Results presented in Table 2 reveal that training is also a predictor of innovation. There are significant and positive relationships between training activity and all four types of innovation investigated. Like appraisal, training provides clarity about the skills that the organization is seeking to develop and a clearer sense of direction for individual learning. Training can also enhance performance. This is particularly important in situations where organizations are seeking to produce innovation. Within such a context, it is necessary to equip staff with high level technical and interpersonal skills so that they can identify where improvements may be made and persuade others of the value of any new ideas put forward. This is in line with Amabile's (1996) exponential theory of creativity and innovation. There are two main ways in which performance may be enhanced through training. The training process increases peoples' perceptions that the organization is investing in them. For this reason, they will actively seek out opportunities to apply any knowledge acquired through training, in a way that is beneficial for the organization. Equity theory (Adams, 1963) for example, proposes that people either consciously or unconsciously seek to achieve a balance between outcomes (what they are expected to achieve) and inputs (pay, hours worked, training provided, for example). Similarly, theories to do with the psychological contract (e.g. Herriot & Pemberton, 1995) suggest that both the employer and the employee hold a set of expectations of one another. Where the employees believe that their expectations

relating to development are being met, it seems reasonable to assume that they will endeavour to perform in a way that meets organizational expectations. Again, such an attitude is likely to increase the probability of learning acquired being applied.

The second reason why training activity is likely to enhance performance is that it has a direct effect upon the development of skills, thus enabling individuals to become increasingly confident of their ability to make an effective contribution. Numerous theories to do with empowerment and creativity (e.g. Spreitzer, 1995) suggest that individuals with high levels of self-efficacy, or confidence in performing their roles, are more able to produce new ideas than those who do not have such confidence.

The findings are presented in table 11 are deserving of further comment. An interaction effect is observed between training and a commitment to human resource planning. This effect applies only to innovation in technical systems, not to the other types of innovation. Whilst this finding has to be interpreted with caution, it suggests that people management is a powerful driver for change where policies and practices complement and support one another and are focused upon enhancing performance. No other interaction effects between strategic and operational variables were found in the study. The tentative conclusion to be drawn may be that organizations wishing to produce innovation on a sustained basis need to be concerned first and foremost with adopting a planned approach to the management of human resources, whilst simultaneously adopting effective training practices.

Turning to Tables 4, 5 and 6, I consider the association between appraisal linked to remuneration and innovation. Negative relationships are observed for all types of innovation, relationships which apply to all three groups of employees- management,

professional and technical staff and clerical and administrative staff. This is a striking finding. Literature, reviewed in chapter 2, suggests that individual pay for performance inhibits team-working and collaborative endeavour, thereby diminishing, rather than enhancing, organizational effectiveness. Furthermore, linking pay to appraisal undermines many of the potentially positive outcomes associated with the appraisal process (Bloom, 1999). Doing so engenders a sense of insecurity and risk that may inhibit the frank and open discussion of development needs, for example (Bloom & Milkovich, 1998). This study provides evidence in support of such research, and in broad support of hypothesis 7 in chapter 2. It is an important finding, especially given the lack of research evidence currently available to address this point.

### Conclusion

The findings of this study provide support for the theoretical model put forward in Chapter 2 and advance thinking to do with the relationship between people management practices and organizational learning in number of ways. While many authorities have proposed that effective people management practices will result in organizational learning, little empirical work has to date has provided evidence of this relationship. For this reason, few sources have been able to explain the way in which such a relationship is likely to occur. I have argued in this and the previous chapter that HR practices, as a general rule, create a framework that enables individuals to learn and develop, and, through their collective efforts, to produce innovation. This happens in two main ways. Strategic approaches provide focus and a sense of direction for developmental activity. Through operational practices, such as appraisal, training and

induction, this focus is articulated and the necessary support provided for individuals to acquire the skills necessary to enable organizational learning to take place.

A number of implications are presented for practitioners. The evidence suggests that people management activity deserves a higher profile in terms of the way it is conceived and administered than is frequently the case, particularly where organizations are seeking to produce innovation. A strategic framework provides the necessary sense of direction and demonstrates that there is support for such activity from the senior management team. Where a strategic framework is used in conjunction with effective operational practices, it is reasonable to assume that HR activity will have a stronger effect on organizational learning than where there is no such combined effect. Findings make explicit the need to develop clearly considered induction arrangements, to engage in high levels of training and to make appraisal interviews available for staff where organizations are seeking to produce high levels of innovation. Such practices communicate organizational expectations and provide support and guidance for the development of skills.

According to the results of this study, appraisal is a more powerful predictor of innovation than either training or induction. It appears, however, that the positive benefits attached to this process are undermined in situations where pay forms part of the agenda for discussion. The conclusions do not suggest that 'paying for performance' has a detrimental effect on learning and innovation in all scenarios. Some studies have shown that performance-related pay schemes have a positive bearing on innovation because they show that the organization recognizes the value of risk-taking and high achievement. This study does suggest, however, that administering such schemes

through the appraisal process is not helpful, and that organizations would be well advised to develop alternative mechanisms for evaluating performance and making pay awards where appropriate.

A limitation of the studies considered in chapters 4 and 5 is that I have not taken into account any possible interaction effect between mechanisms designed to create internal variety and those intended to develop skills. The next chapter explores the way in which both sets of practices, where used in combination with one another, may have particularly strong and positive effects on organizational learning and innovation.

Other methodological limitations connected with this study are similar to those mentioned in the previous chapter. The sample size is larger than was the case in the previous study, but at 30, is still relatively small. Therefore, further research is needed on a larger number of organizations to provide evidence in support of any conclusions reached. Whilst again controls have been employed to rule out the impact of certain extraneous variables, such as prior innovation, it is not possible in a study of this nature to take account of all possible variables which may influence outcomes measured.

Many of the relationships exhibited are, however, sufficiently strong to enable valid inferences to be drawn. As discussed in the previous chapter, this is a longitudinal study making it possible to take into account control variables such as prior innovation. In addition, as discussed in the previous chapter, the data for dependent and independent variables are drawn from distinct and different sources, thus lending further credence to the validity of the findings.

## CHAPTER 6

### The combined effect of variety and skill development on innovation

#### Introduction

An argument has been presented in the theoretical section of this thesis to suggest that it is possible to manage organizational learning, and to produce innovation, where mechanisms intended to create variety and to develop skills are employed in conjunction with one another. Chapter 4 explored the extent to which HRD practices designed to promote workplace learning -such as liaison with customers and suppliers, job rotation and career development meetings- have a significant and positive effect upon innovation. Chapter 5 provided evidence to suggest that people management practices at strategic and operational level play a powerful role in facilitating individual and organizational learning, measured in terms of the amount of innovation produced. The argument is that HR practices provide focus and support for the development of skills, whilst HRD practices designed to expose people to new and different experiences create internal variety.

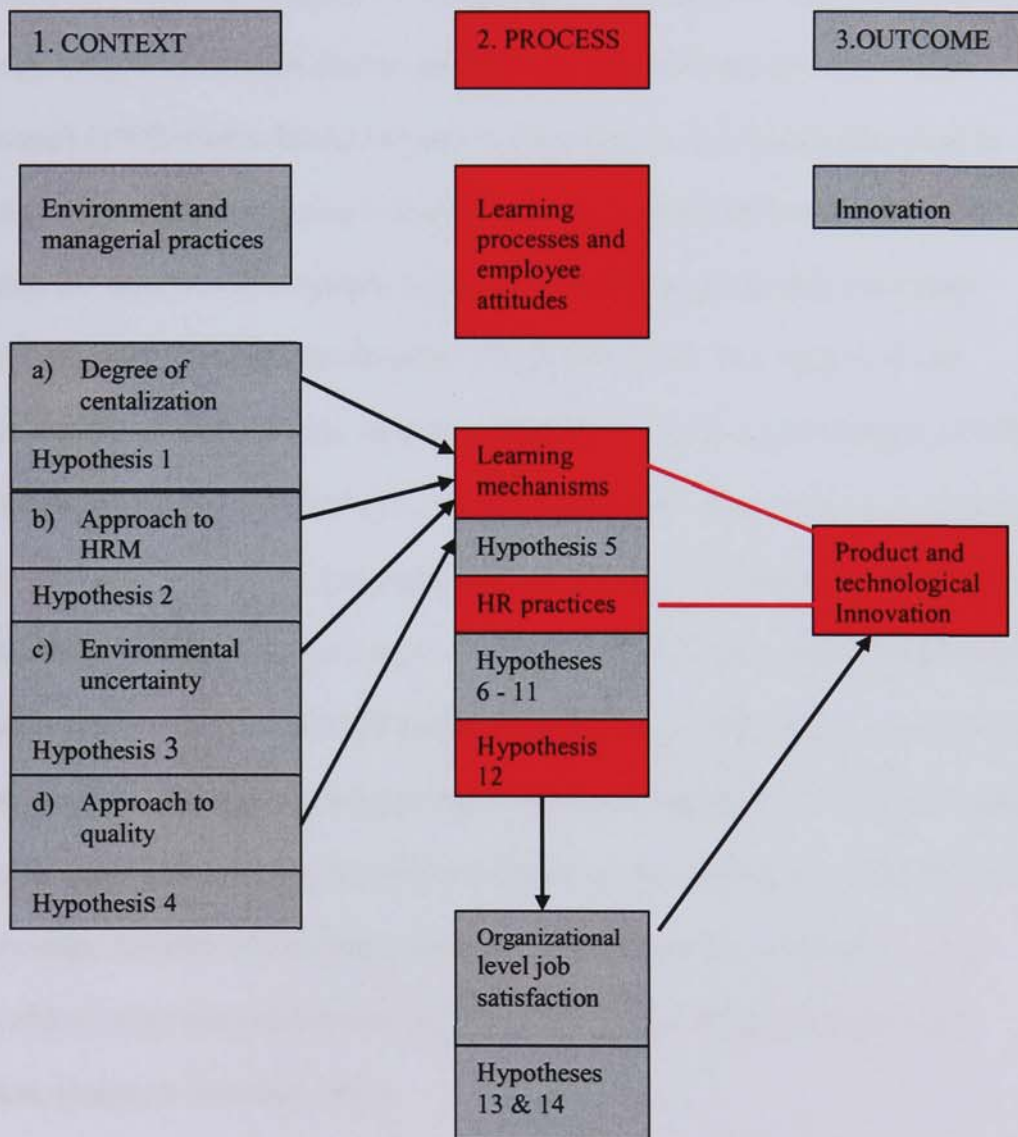
This chapter develops a clearer measure of 'internal variety', described in the methodology section of this study. Using this measure, I am able to establish whether or not the mechanisms specifically intended to expose individuals to new and different experiences have a positive bearing on innovation, as theory suggests. This makes it possible to overcome the main limitation associated with the study presented in chapter 4, which did not distinguish clearly between measures intended to create variety as opposed to those intended to develop skills. A central premise for this study is that through

creating opportunities for individuals to experience variety, organizations increase their propensity to produce sustained innovation.

Hypothesis 12 (a): Organizations that develop practices to enhance internal variety will produce relatively high levels of innovation at a later point in time.

The methodology for the study is outlined in detail below. The approach adopted makes it possible for me to explore the relative importance of mechanisms designed to enhance internal variety when considered in a regression together with HR practices which are, according to my argument, primarily concerned with the development of skills. The model reproduced overleaf depicts this proposition diagrammatically (in a simplified format), with the highlighted boxes representing those aspects of the model considered in this study. At strategic level, I take account of whether or not HR strategy is endorsed by the senior management team and the degree of planning manifested in HRM. At operational level, I consider whether or not the organization has a formal appraisal scheme, the extent and sophistication of training and perceptions of the effectiveness of induction. I then look at the combined effect of using mechanisms designed to enhance variety together with those intended to develop skills. In other words, is it possible that where mechanisms are employed to facilitate the generation of internal variety and at the same time to develop skills, more innovation is produced than would be the case where such groups of practices are applied separately?

### Model guiding the research



There is a substantial theoretical rationale for this possibility. Knowledge acquired through exposure to new experiences and perspectives is more likely to be applied and enacted where individuals have a clear understanding of where the business is going and what their role is in the achievement of objectives. Schulz (2001), for example, shows that the relevance of new knowledge can only be explored where it is passed to levels within the organizational hierarchy where there is clarity about how such knowledge may be of value in relation to the achievement of corporate objectives. Scarborough (1999) shows that knowledge is more likely to be articulated to lead to positive outcomes in project teams where formal mechanisms exist to provide co-ordination and direction for team members. West (2002) proposes that innovation implementation is more likely in situations where individuals have high levels of autonomy whilst at the same time clear work objectives. Stevens and Campion (1994) argue that team integration skills facilitate innovation in two main ways. Firstly, such skills enable members to share collaboratively and to resolve conflict in a positive way. Secondly, through employing such skills, the performance of individual team members is managed and goals are articulated so that knowledge acquired through exposure to new experiences can be applied in a focused way to the task in hand. The argument is that the stronger the team integration skills, the more likely it is that the team will benefit from the knowledge diversity of individual members. This will make a difference to the quality of new proposals put forward and also to their successful implementation (Campion, Pepper & Medsker, 1996).

The literature considered in the first two chapters also provides insight into the relationship between practices used to develop skills and to promote internal variety and

learning and innovation. The first two chapters suggested that organizational learning is a four-stage process, involving intuiting, interpreting, integrating and institutionalizing. It was argued that innovation is the outcome of effective organizational learning. This model suggests that, whilst it is necessary to provide opportunities for individuals to be creative, organizational innovation is produced where efforts are also made to manage the final two stages of the organizational learning cycle. This means that it is important to consider how jobs can be designed in order to increase the opportunities that people have for autonomy and for the exercising of control. In addition, frameworks need to be established to ensure that any creative insights engendered can be directed towards achieving the organization's objectives. Appraisal, training and induction are good examples of such frameworks.

The combined effect of exposing individuals to new and different experiences, whilst simultaneously developing their skills, is likely to be positive. Individuals who are challenged, but believe that they have the skills to deal with such challenge, will probably experience high levels of intrinsic motivation (Amabile, 1988). This concept has been raised in previous chapters, and represents a state whereby individuals are fully absorbed in the successful accomplishment of a task, and aware that there is support within the broader context for the application of any creative insight that they may have. In such situations, it is probable that individuals will experience 'flow' (Csikszentmihalyi & Sawyer, 1995). This happens when individuals are faced with a challenging task but believe that they have the skills to carry it out. Such situations can result in individuals feeling completely absorbed in their work, strong positive affect, a sense of heightened

awareness and strong urges to creative thinking. Such a state is highly conducive to exploratory learning and innovation.

Training, induction and appraisal, conducted effectively in situations where individuals also have the opportunity to be exposed to a variety of experiences, have a positive impact upon organizational learning for the reasons outlined above.

Hypothesis 12 (b)

Appraisal and internal variety, employed in conjunction with one another, will have a more pronounced effect upon product and technological innovation than may be the case when each of these variables is applied separately.

Hypothesis 12 (c)

Training and internal variety, employed in conjunction with one another, will have a more pronounced effect upon product and technological innovation than may be the case when each or other of these variables is applied separately.

Hypothesis 12 (d)

Induction and internal variety, employed in conjunction with one another, will have a more pronounced effect upon product and technological innovation than may be the case when each of these variables is applied separately.

The previous chapter explored the relationship between strategic level HR practices and innovation in products, technical systems, processes and technology. Analysis revealed a positive relationship between organizations' willingness to engage in human resource planning and innovation in technical systems and production processes. Similar relationships were observed between professed endorsement of HR strategy by the senior management team and the same outcomes. As discussed in the last chapter,

such a strategic focus ensures that adequate resources are made available for individuals to pursue learning needs. It also means that those who are in positions of power within organizations are clear about which behaviours they will reward.

Where organizations are seeking to produce innovation, gaining the support of senior managers for learning activity is an important starting point. Such a strategic focus does not, however, necessarily provide individuals with exposure to new experiences. There are substantial theoretical arguments, expressed in earlier chapters, to the effect that only through such exposure can individuals develop the necessary cognitive flexibility to embrace change and innovation. Therefore, it may be that the combination of mechanisms designed to promote internal variety and strategic support for HR activity will have a more powerful relationship with innovation than the aggregate of their individual effects.

#### Hypothesis 12 (e)

Where top management endorse HR strategy and where opportunities exist for individuals to experience internal variety, the effect upon innovation will be more pronounced than may be the case when each of these approaches is applied separately.

#### Hypothesis 12 (f)

Where there is a high degree of HR planning and where opportunities exist for individuals to experience internal variety, the effect upon innovation will be more pronounced than when each of these approaches is applied separately.

### Method

#### Sample and data collection

The data set used for this study is as described in Chapter 3. As is the case for the three studies outlined to date, the data set was developed as part of a larger study of 160 companies conducted between 1993 and 1999 (West, Patterson, Lawthom, & Maitlis, 1999). This longitudinal study examined market environment, organizational characteristics and managerial practices. Senior managers in these companies were interviewed on site. As discussed previously, areas covered in the interview included: market environment, organizational structure, competitive strategies, production technology, work design, quality practices, human resource management, training and research and development.

Here I report relationships between data gathered in managerial interviews in 22 companies and data from innovation surveys of the same companies. The 22 companies were selected because data exist for organizational learning and human resource management practices as well as for innovation. The sample is identical to that described in Chapter 4. The average number of employees in these companies was 260; the smallest company had 70 and the largest 900 employees. Organizations were drawn from three main industrial groups: electronics and communications, food and drink and mechanical engineering. These manufacturing sectors were chosen because they were those sectors with the largest numbers of UK manufacturing companies and because they employ the largest number of people in manufacturing.

This is a longitudinal study, which involves taking measurements of HR practices, learning mechanisms and innovation at specific points in time. Three time points are

involved in this exercise. At Time 1, measurements were taken of innovation and of size and profitability in order to allow me to control for the effect of these variables on the outcome variable (innovation at Time 3). At Time 2, the research team measured HR practices and learning mechanisms in the ways described below and at Time 3 the final measurement was made of innovation. There was approximately one year between each measurement point. This time interval was judged to be a sufficient period of time for patterns and levels of innovation to change in a manufacturing organization. Using a longitudinal design enabled examination of the direction of any relationships between mechanisms designed to promote internal variety, people management practices such as appraisal, induction and training, and innovation.

#### The interviews

Interviews in the first wave of data collection were carried out with senior managers in each of the organizations. Companies were briefed before the researchers' visit on what areas the interview schedule covered and were asked to determine which senior managers were best placed to answer questions in each of the interview schedule areas.

Four or five senior managers took part in the interviews for the 22 organisations in the sample, including the Chief Executive of the company, Production Director and Human Resources Manager. Interviews always took place on site and in all cases coincided with a tour of the production areas by the researchers. Interviewers were all qualified industrial/organizational psychologists, who had received a minimum of two weeks' training in administering the interview schedule. All interviews were audio taped. In the early stages of each interviewing round, two researchers visited each company in

order to enable investigation of inter-rater reliability. Below I explain how the concepts referred to in the hypotheses were operationalized.

#### Independent variables

**Mechanisms designed to promote internal variety:** Managers were asked to describe the practices employed to promote internal variety. A total of eight binary questions elicited this information:

1. *Are visits arranged to external suppliers or customers for employees who would not normally have such contact as part of their normal job responsibilities?*
2. *Are employees working on the shopfloor in one department ever seconded to another department so that they can learn more about the processes and procedures in that area?*
3. *Are employees working in management in one department ever seconded to another department so that they can learn more about the processes and procedures in that area?*
4. *Does the company support learning/ training that is not work related (e.g. basic skills, hobbies, such as through TEC supported Employee Development Schemes or Employee Led Development, or other such employee development skills)?*
5. *Is training available to management that is work-related, but not directly necessary for the individuals' current job (e.g. learning about processes that occur in other parts of the factory, courses to increase computer skills)?*

6. *Is training available to shopfloor employee that is work-related, but not directly necessary for the individuals' current job (e.g. learning about processes that occur in other parts of the factory, courses to increase computer skills)?*
7. *Do you have any procedures for recording solutions to problems or best practice?*
8. *Do you have any mechanisms by which this knowledge (problem solutions or best practice) is transferred to other areas of the business?*

The score for the existence of mechanisms designed to promote internal variety was the mean of affirmative answers to these questions. This mean was calculated as long as answers to at least six of the eight items were present. Internal reliability was satisfactory (Cronbach's alpha was 0.79).

**Mechanisms designed to facilitate skill development:** In order to determine the extent to which organizations adopted mechanisms designed to facilitate skill development, managers were asked about approaches adopted towards induction, training and appraisal. Managers were asked whether there was an overall training strategy; what were the main objectives over the next three years regarding training; and how training needs of the workforce were assessed. They were also asked to describe current and recent approaches to training in the organization (on a five point scale ranging from 1 - “very reactive, responding as demands arise”, through to 5 - “highly planned and organized”). Information was elicited about the current annual training budget, whether this represented an increase or decrease from the previous year, and how well it met company training needs.

They were asked whether a formal induction programme existed, whether the scheme involved communicating company values to new employees and whether there was any formal means of evaluating whether induction had been carried out as recommended.

For training and induction, mean scores of interviewers were created to allow a variety of dimensions to be taken into account for statistical purposes. So, for example, the mean score used in the study for ‘training’ is a factor of managerial perceptions of the extent, sophistication and vision of training. The mean score for induction considers the overall perceived effectiveness of the induction process. The score for appraisal denotes whether or not a formal appraisal scheme was in existence, according to the response provided by the relevant authority within the company.

#### Dependent variables

The dependent variables for this study were product innovation and innovation in technical systems. Full details of how innovation was measured and scored in these areas are provided in Chapter 4. In brief, the innovation survey was conducted by post and was completed by between four and five technical experts at each organization as appropriate for the innovation domain under investigation. It consisted of open questions and rating scales in relation to new or adapted products and technological innovation (innovations in production technology and production techniques/procedures). Each section was given an innovation rating on a five-point scale from 1 'not at all innovative' to 7 'very innovative'. These were based on the types of change introduced, their magnitude and novelty and the impact on the workforce and the manufacturing process. Raters gave an overall innovation rating to each company.

A variety of mechanisms were employed to validate the findings, as outlined in Chapter 4. For example, the scoring of technical experts was correlated against employee perceptions of the climate for innovation and the ensuing analysis suggested that there was a close match between perceptions of management and staff in this area.

**Product innovation and innovation in technical systems:** While the last two studies considered innovation in four domains (products, technical systems, processes and technology), this study focuses upon product innovation and innovation in technical systems. There were two reasons for doing so. Firstly, earlier studies presented in the thesis suggest that people management practices have a general effect on innovation in production technology and production processes, so it seemed unnecessary to separate the two measurements of innovation for this study. The measure for innovation in technical systems takes into account perceptions of innovation in all the technical areas of the

business. On the other hand, evidence presented in earlier studies suggests that some people management practices are more closely associated with product than with other types of innovation. By focusing upon product innovation and innovation in technical systems, therefore, it became possible to explore these findings in more depth.

For product innovation, respondents gave estimates of the number of entirely new and adapted products developed in the last two years and detailed what percentage of production workers were involved in making the new products. They also gave estimations of current sales turnover accounted for by the new products and the extent to which production processes had been changed to accommodate the new products.

The measure for innovation in technical systems asked respondents to ascertain the rate at which new machines or systems such as single cycle automatics, CNC and robots had been introduced. Respondents were asked to list the three most significant changes in this category introduced over the previous two years. They also gave estimates of the magnitude and novelty of the change for their organization on a three-point scale, ranging from 1 -- "minor", through 2 -- "moderate", to 3 -- "major". Further questions concerned the percentage of production workers requiring retraining to use the different technology, and the proportion of the total production process incorporating the technology. They were also asked about changes in production techniques/procedures which focused on such changes as the introduction of scheduling and planning systems (e.g. MRP II), Just-In-Time (JIT) management or Total Quality Management (TQM).

### Control Variables

**Size:** Organizational size was represented by counting the number of full-time equivalent employees in each organization. These data were log transformed in all analyses to normalise the distribution.

**Profitability:** Three main sources of information were used to determine company performance: company accounts, management accounts and the Central Statistical Office (CSO) database. Profitability was measured as profits before tax, deflated by the producer price index of the industry in which the firm belonged and normalized on firm employment to control for size.

**Prior innovation:** The research design allowed us to measure product innovation at Time 1 in the ways described above, and to use this measurement as an additional control variable for the dependent variable (product innovation at Time 2).

### Analytical procedure

The analytical procedure was designed to determine the extent to which the hypotheses were supported by the data by using regression analyses. The analyses involved assessing the extent to which the two groups of OL mechanisms predicted product innovation, controlling for organizational size, prior profitability and prior levels of innovation.

By controlling for prior levels of innovation, I could be more confident in affirming that significant relationships indicated that OL mechanisms at one point in time predicted change in innovation over the subsequent two years. The approach was to enter the two groups of OL variables- those designed to develop internal variety skills and those designed to develop skills- separately into the regression analysis. I then entered

both OL variables together to determine which accounted for more of the variation in innovation. For the final step, I calculated the effect of any interaction between the two groups of mechanisms on innovation. The interaction variable was calculated by multiplying each HR variable with the internal variety measure.

The sample size for the data presented in Table 1 is 27, whilst 22 organizations are represented in the rest of the study. This is because Table 1 does not include Time 1 data; thus I was able to include 5 organizations which were not part of the Time 1 data collection exercise. It was important to refer to Time 1 data for the rest of the study, because doing so made it possible for me to make reference to the control variables detailed above.

## Results

Means, standard deviations and intercorrelations between the variables are shown in Table 1. There is a statistically significant correlation between the score for internal variety and innovation in technical systems ( $r = 0.56, p = <.01$ ); between the extent and sophistication of training and innovation in both products and technical systems ( $r = .36, p = <.05, r = .54, p = <.01$  respectively); between appraisal and product innovation ( $r = .37, p = <.05$ ); and between induction and both product innovation ( $r = .35, p = <.05$ ) and innovation in technical systems ( $r = .51, p = <.01$ ). There is a significant but not highly significant relationship between appraisal and training ( $r = .32, p = <.05$ ), suggesting that it makes sense to consider these variables separately when analyzing in more depth their relationships with innovation.

Table 2 shows that internal variety is a significant predictor of product innovation and innovation in technical systems ( $\beta = .48, p < .05$ ;  $\beta = .57, p < .05$  respectively). Thus

the study offers support for Hypothesis 12 (a), that organizations which develop practices to enhance internal variety will have relatively high levels of innovation.

Whilst this was not the subject of a formal hypothesis, there is evidence, presented in Table 2, to show that appraisal, training and induction predict innovation. Appraisal predicts product innovation and innovation in technical systems ( $\beta = .42$ ,  $p < .01$ ;  $\beta = .42$ ,  $p < .05$  respectively). Training predicts innovation in technical systems ( $\beta = .58$ ,  $p < .01$ ) and induction predicts innovation in technical systems ( $\beta = .48$ ,  $p < .05$ ). These findings take account of control variables, and represent steps 1 and 2 detailed in this table. They virtually replicate findings reported in Chapter 5, which is to be expected given that the sample is similar (seventeen organizations are common to both studies).

Table 1

Means, Standard deviations and Correlations for all study variables

|                                 | Mean | Standard deviation | Product innovation | Innovation in technical systems | Internal variety score | Training | Appraisal |
|---------------------------------|------|--------------------|--------------------|---------------------------------|------------------------|----------|-----------|
| Product Innovation              | 2.64 | 1.34               |                    |                                 |                        |          |           |
| Innovation in technical systems | 2.91 | .86                | .64**              |                                 |                        |          |           |
| Internal variety score          | .39  | .26                | .28                | .56**                           |                        |          |           |
| Training                        | 2.84 | .78                | .36*               | .54**                           | .41*                   |          |           |
| Appraisal                       | .62  | .49                | .37*               | .28                             | .11                    | .32*     |           |
| Induction                       | 3.14 | .79                | .36*               | .51**                           | .62**                  | .57**    | .23       |

\*p< .05. \*\* p.01 \*\*\* p<.001  
n = 27

Table 2

Summary of Hierarchical Regression of Product Innovation and Innovation Technical Systems onto Internal Variety, Appraisal, Training and Induction

| Independent variables | Product innovation |              |                       | Innovation in technical systems |              |                       |
|-----------------------|--------------------|--------------|-----------------------|---------------------------------|--------------|-----------------------|
|                       | $\beta$            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                         | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls              |                    | .19          | .18                   |                                 | .09          | -.03                  |
| Internal variety      | .48*               | .25          | .21                   | .57*                            | .31          | .31                   |
| Controls              |                    | .24          | .28                   |                                 | .07          | .01                   |
| Appraisal             | .42**              | .12          | .17                   | .42*                            | .12          | .17                   |
| Controls              |                    | .27          | .28                   |                                 | .07          | .01                   |
| Training              | .33                | .09          | .07                   | .58**                           | .26          | .29                   |
| Controls              |                    | .24          | .01                   |                                 | .07          | .01                   |
| Induction             | .28                | .08          | .02                   | .48*                            | .14          | .20                   |

\*p< .05; \*\* p.01; \*\*\* p<.001; n=22

In order to analyze the extent to which both sets of OL mechanisms – those intended to elicit variety and those designed to develop skills - were significant in predicting innovation, they were entered jointly in regression analysis, taking account of control variables. Finally, I entered the relevant interaction variable, calculated as detailed above.

Results are presented in Tables 3 to 7 and Figures 1 - 5. Table 3 shows that both appraisal and internal variety are significant in predicting product innovation, explaining 18% ( $p < .05$ ) and 26% ( $p < .001$ ) of the variance respectively. Moreover, the interaction between these two variables and product innovation is statistically significant ( $\beta = .45$ ,  $p < .01$ ). Figure 3 shows that, when there is high internal variety, there is a much stronger relationship between the sophistication and extensiveness of appraisal and product innovation, than when internal variety is low. This supports the interpretation that a combination of internal variety and skill development may be a potent cocktail for encouraging innovation. There is thus substantial support for Hypothesis 12 (b), which proposes that appraisal and internal variety, employed in conjunction with one another, will have a more pronounced effect upon product and technological innovation than may be the case where one or other of these variables is applied separately.

Figure 1: Appraisal, internal variety and innovation in products

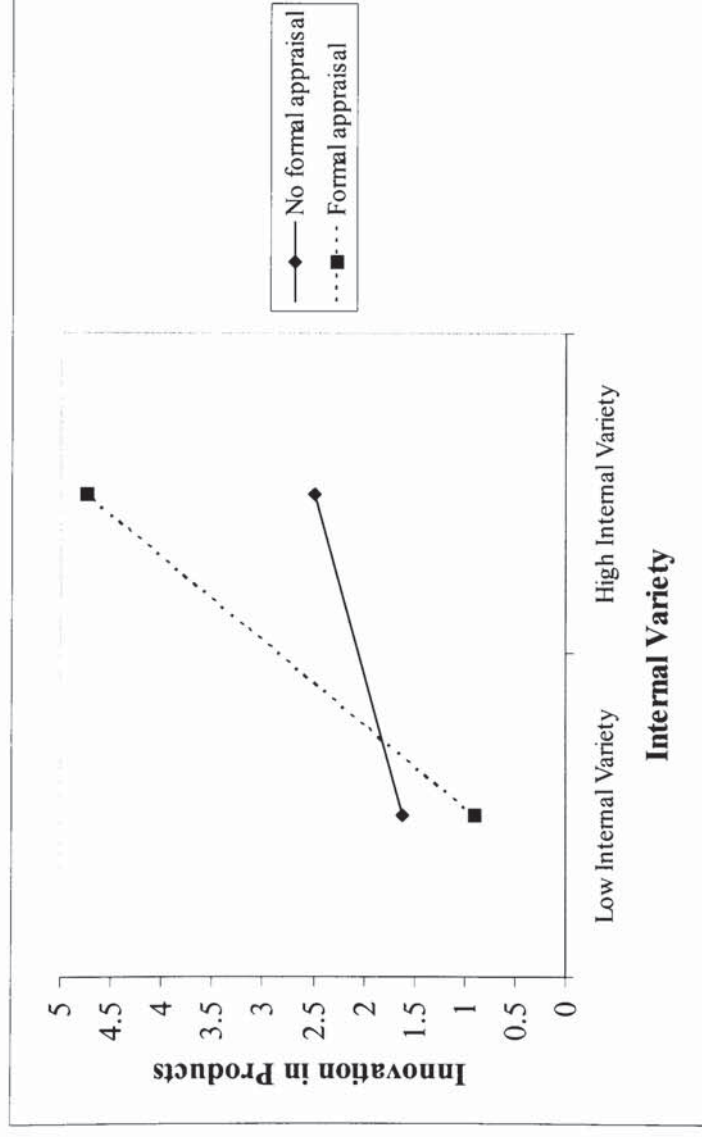


Table 3

Summary of Hierarchical Regression of Product Innovation and Innovation Technical Systems onto Appraisal, Internal Variety and Appraisal X Internal Variety

| Independent variables        | Product innovation |              |                       | Innovation in technical systems |              |                       |
|------------------------------|--------------------|--------------|-----------------------|---------------------------------|--------------|-----------------------|
|                              | $\beta$            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                         | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls                     |                    | .26          | .14                   |                                 | .11          | -.04                  |
| Internal variety             | .67**              | .25          | .18                   | .65**                           | .30          | .42                   |
| Appraisal                    | .30*               | .18          | .26                   | .42                             | .09          | .08                   |
| Appraisal X Internal Variety | .45**              | .13          | .15                   | .31                             | .07          | .31                   |

\* $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ ;  $n = 22$

Data presented in Table 4 show that there is a significant interaction between training and internal variety ( $\beta = .59, p < .01$ ). This suggests that where training is used in conjunction with internal variety, higher levels of innovation in technical systems are produced than where they are applied separately. In other words, when there is high internal variety in organizations, there is a much stronger relationship between the sophistication and extensiveness of training in organizations and innovation (in technical systems) than when the approach to training is unsophisticated. Moreover, as detailed above, high internal variety in combination with weak approaches to training seems a worse combination (in terms of innovation in technical systems) than low internal variety and weak approaches to training. These findings are expressed in Figure 2. There is no significant interaction effect when product innovation rather than innovation in technical systems is considered. Thus these data offer qualified support for Hypothesis 12 (c), that training and internal variety, employed in conjunction with one another, will have a more pronounced effect upon product and technological innovation than may be the case where one or other of these variables is applied separately.

Figure 2: training, internal variety and innovation in technical systems

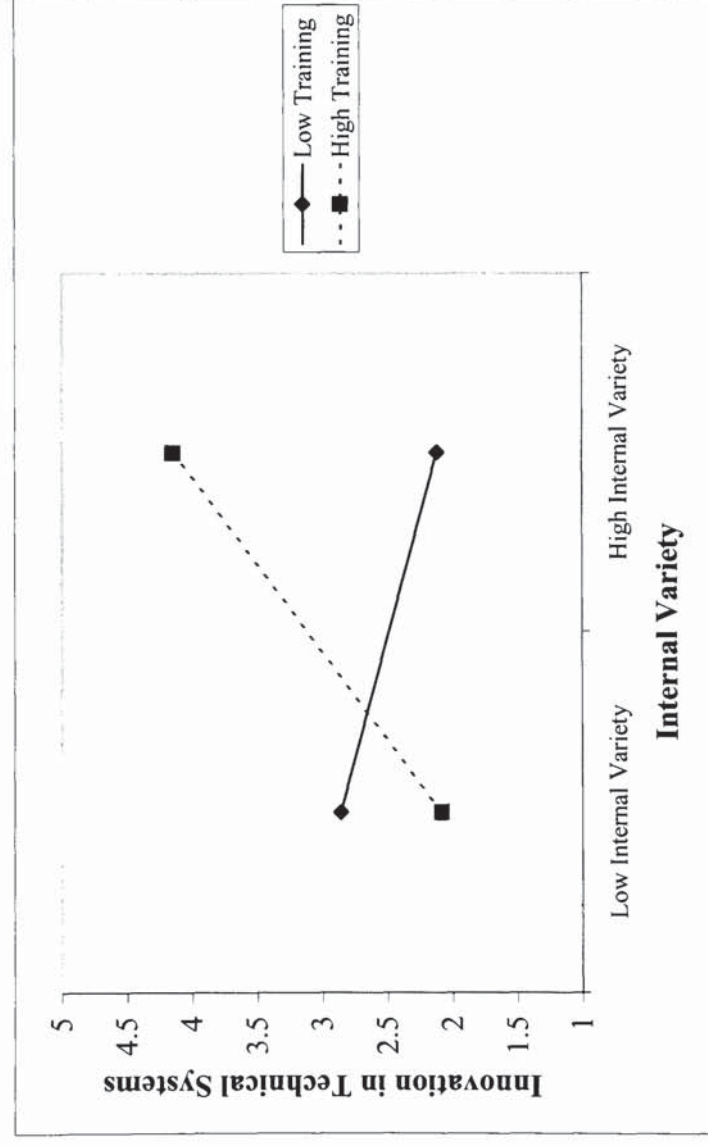


Table 4

Summary of Hierarchical Regression of Product Innovation and Innovation in Technical Systems onto Training, Internal Variety and TrainingX Internal Variety

| Independent variables       | Product innovation |              |                       | Innovation in technical systems |              |                       |
|-----------------------------|--------------------|--------------|-----------------------|---------------------------------|--------------|-----------------------|
|                             | $\beta$            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                         | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls                    |                    | .26          | .14                   |                                 |              | -.04                  |
| Internal variety            | .31                | .25          | .26                   | .07                             | .11          | .12                   |
| Training                    | .43                | .10          | .09                   | .12                             | .30          | .31                   |
| Training X Internal Variety | .18                | .02          | -.01                  | .59**                           | .21          | .22                   |

\*p< .05; \*\* p.01; \*\*\* p<.001; n=22

Finally, I present data in support of Hypothesis 12 (d), that there will be an interaction effect between mechanisms designed to promote internal variety and induction, and innovation. The pattern of findings presented in Table 5 is similar to that described above. The interaction between induction and internal variety is significant in relation to innovation in technical systems ( $\beta=.62$ ,  $p<.01$ ) but not in relation to product innovation. Furthermore, Figure 3 shows that, when there is high internal variety there is a much stronger relationship between the sophistication and extensiveness of induction practices and product innovation than when internal variety is low. Moreover, high internal variety with poor induction is associated with *lower* levels of product innovation than when there are few mechanisms designed to promote internal variety and induction is poor.

Figure 3: induction, internal variety and innovation in technical systems

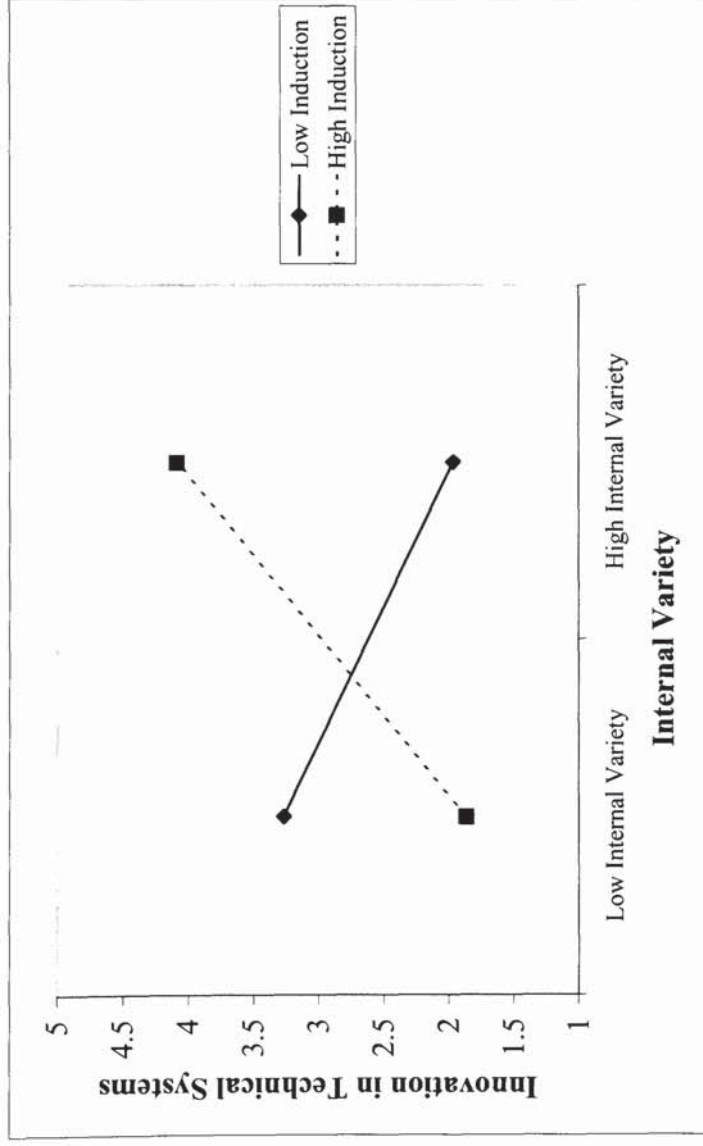


Table 5

Summary of Hierarchical Regression of Product Innovation and Innovation in Technical Systems onto Induction, Internal Variety and Induction X Internal Variety

| Independent variables        | Product innovation |              |                       | Innovation in technical systems |              |                       |
|------------------------------|--------------------|--------------|-----------------------|---------------------------------|--------------|-----------------------|
|                              | $\beta$            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                         | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls                     |                    | .26          | .14                   |                                 | .11          | -.04                  |
| Internal variety             | .31                | .25          | .26                   | .21                             | .30          | .31                   |
| Induction                    | .35                | .08          | .07                   | .17                             | .11          | .10                   |
| Induction X Internal Variety | .18                | .02          | .18                   | .62**                           | .18          | .21                   |

\*p< .05; \*\* p.01; \*\*\* p<.001; n=22

Turning to Hypotheses 12(e) and 12(f), I refer to data presented in Tables 6 and 7, as well as Figures 4 and 5. There is a highly significant interaction effect between the variable measuring whether or not HR strategy is endorsed by the top management team, the score for internal variety and innovation in technical systems ( $\beta = .88$ ,  $p < .001$ ). The interaction effect between the two variables accounts for 36% of the variance observed for this type of innovation. There is also a significant interaction between the variable measuring the degree of HR planning and the score for internal variety and innovation in technical systems ( $\beta = .47$ ,  $p < .06$ ). This interaction effect accounts for 8.5 % of the variance for innovation in technical systems. No significant interaction effects were observed in either case in relation to product innovation. These findings provide overall, but not complete, support for hypotheses 12 (e) and 12 (f). These stated respectively that there will be an interaction effect between the score for internal variety and two strategic-level variables: the extent to which HR strategy is endorsed by the senior management team and the extent to which human resource planning is undertaken.

Figure 4 shows that internal variety has a slightly negative effect on innovation (in technical systems) where HR strategy is not endorsed by the top management team. This suggests that high internal variety in combination with weak approaches to strategic integration is a worse combination than low internal variety and weak approaches to strategic integration. Where there is high internal variety, combined with high endorsement of HR strategy by top management, levels of innovation (in technical systems) are markedly higher than where internal variety is employed without this strategic focus.

Turning to Figure 5, a similar trend can be detected. High internal variety employed together with low HR planning has a slightly negative effect on innovation in technical systems, suggesting that in situations where there is little or no HR planning, it may be preferable to provide little or no internal variety. There is a clear and positive interaction, however, between high HR planning and high internal variety, again leading to the tentative conclusion that where variety is employed together with a sophisticated approach towards HR planning, effective learning and innovation will be engendered. The figure should be interpreted with caution, however; the statistical significance of this finding is not as high as that outlined above ( $\beta = .47$ ,  $p = .06$ ).

Figure 4: HR strategy endorsed by top management team and innovation in technical systems

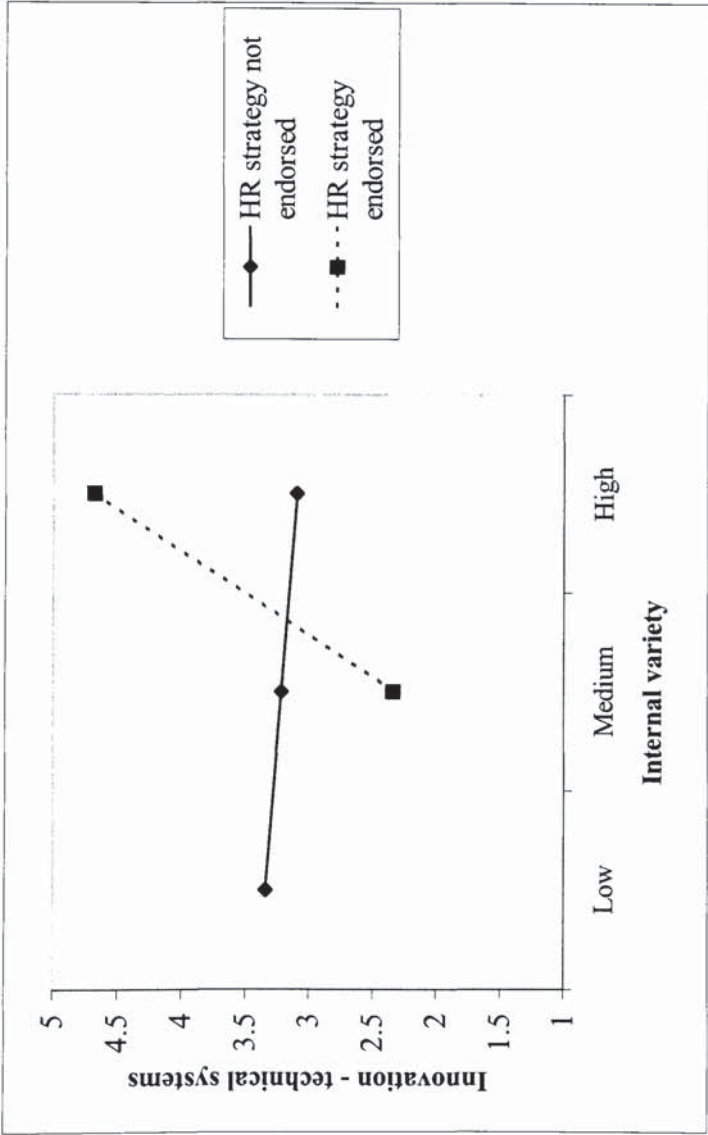


Figure 5: Degree of planning in HRM and innovation in technical systems

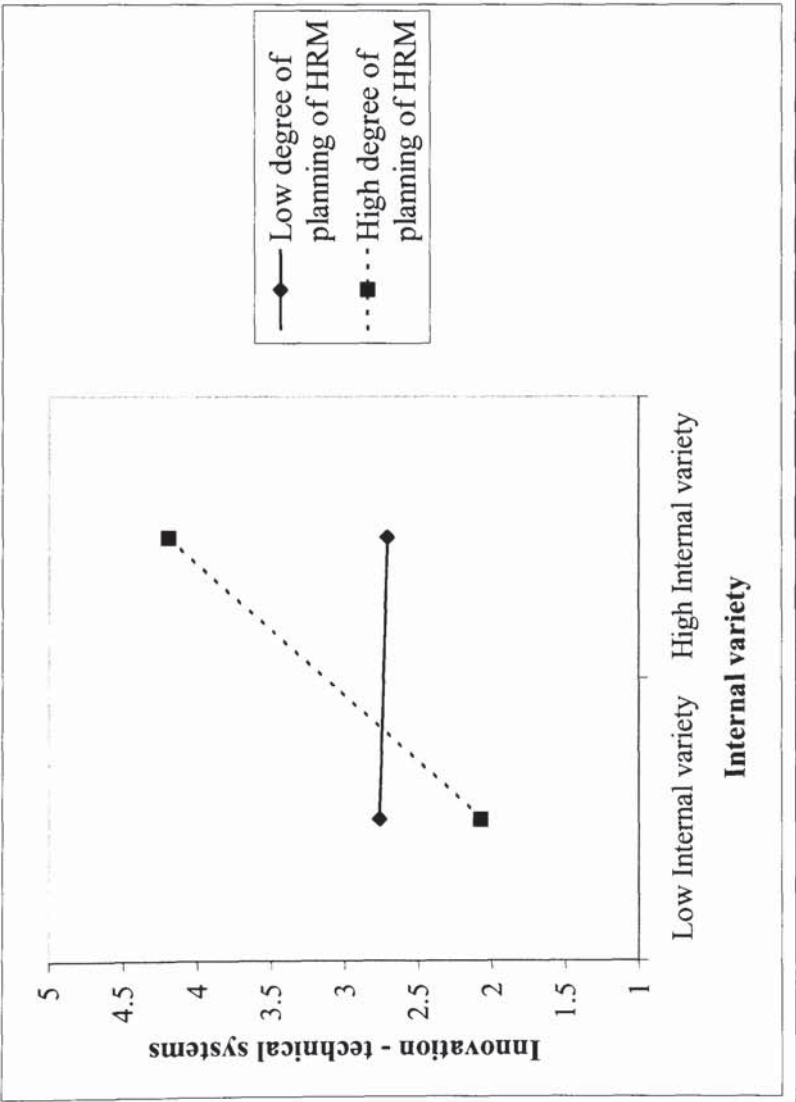


Table 6

Summary of Hierarchical Regression of Product Innovation and Innovation in Technical Systems onto HR strategy Endorsed by Senior Management, Internal Variety and Strategy Endorsed X Internal Variety

| Independent variables                     | Product innovation |              |                       | Innovation in technical systems |              |                       |
|---|--------------------|--------------|-----------------------|---------------------------------|--------------|-----------------------|
|   | $\beta$            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                         | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls                                  |                    | .24          | .14                   |                                 | .12          | -.04                  |
| Internal variety                          | .53*               | .56          | .30                   | .87***                          | .20          | .21                   |
| HR Strategy Endorsed by Senior Management | .16                | .10          | .06                   | -.34                            | .13          | .10                   |
| HR Strategy Endorsed X Internal Variety   | -.01               | .32          | .21                   | .88**                           | .32          | .41                   |

\*p< .05; \*\* p.01; \*\*\* p<.001; n=22

Table 7

Summary of Hierarchical Regression of Product Innovation and Innovation in Technical Systems onto HR Planning, Internal Variety and HR Planning X Internal Variety

| Independent variables          | Product innovation |              |                       | Innovation in technical systems |              |                       |
|--------------------------------|--------------------|--------------|-----------------------|---------------------------------|--------------|-----------------------|
|                                | $\beta$            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                         | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls                       |                    | .24          | .14                   |                                 | .10          | -.01                  |
| Internal variety               | .45*               | .55          | .26                   | .47*                            | .57          | .31                   |
| HR Planning                    | .16                | .31          | .16                   | .21                             | .29          | .18                   |
| HR Planning X Internal Variety | .21                | .02          | -.01                  | .47*                            | .15          | .09                   |

\*p< .06; \*\* p.01; \*\*\* p<.001; n=22

## Discussion

The findings suggest that two specific groups of HRM mechanisms are likely to generate the learning required to produce innovation in work organizations. Those designed to generate internal variety and those intended to develop skills appear to be related significantly to innovation. The effect is more powerful where both groups of mechanisms are employed simultaneously. These findings apply for both strategic and operational HR practices. It is clear from this study that where organizations adopt a strategic approach to people management activity, and at the same time make use of mechanisms designed to promote internal variety, more innovation is produced than where one or other of these approaches is adopted on its own.

Similar trends are revealed when I consider the relationship between HR practices at an operational level, mechanisms designed to promote internal variety and innovation. As indicated in Chapter 5, the sophistication and extensiveness of training is a significant predictor of innovation in technical systems but not of product innovation. This suggests that training in manufacturing organizations is focused around the skills of doing the job on the shop floor rather than around creativity, innovation or product development. This makes sense, since most manufacturing organizations are likely to invest responsibility for product innovation in R&D departments or functions. However, as detailed in earlier studies, innovation in technical systems is more within the domain of operators who tend to have direct responsibility for production processes and their improvement. The relationship between induction systems and innovation was also confined to technical systems, probably for similar reasons. Induction focuses on the

process of doing the job and the means of achieving organizational objectives rather than product innovation more specifically.

In contrast, the extent of mechanisms designed to promote internal variety and the sophistication and extensiveness of appraisal systems had significant relationships with both product innovation and innovation in technical systems in the manufacturing organizations considered in this study. Promoting internal variety via secondments; visits to customers and suppliers; through training beyond job requirements; and knowledge management practices (such as recording best practice solutions to problems) are less focused and more pervasive strategies for encouraging organizational learning and innovation. Consequently they may affect innovation in all major domains of organizational activity and particularly in technical systems and products. By creating an environment within which learning is developed and encouraged, employees and organizations may be ready to adapt to environmental change by innovating in most areas.

Appraisal may have similarly pervasive effects since, as discussed in Chapter 5, it focuses employees on key objectives in their work, making it more likely they will spot discrepancies between what they are and what they should be achieving (Guzzo & Bondy, 1983) – such performance gaps are often the stimulus for innovation. Appraisal provides feedback on performance gaps and is used as an opportunity to identify training and personal development needs (Campion, Pepper & Medsker, 1996). Finally, appraisal (properly conducted) allows employees to feel that they are valued and respected in the organization (Carlton & Sloman, 1992; Stiles, Gratton, Truss, Hope-Hailey & McGovern, 1997). This may create the psychological safety within which people are more likely to

experiment with ideas for new and improved ways of doing things (see Chapters 2 and 5 for the full rationale for these arguments). Overall, appraisal (when used extensively and in a sophisticated way) can be a powerful process for creating the conditions for encouraging organizational learning and innovation.

What is particularly striking about this study is the demonstration of the value of combining people management practices designed to promote internal variety with HRM practices focused on skill development (such as induction, training and appraisal).

Results reveal that when there is high internal variety there is a much stronger relationship between the sophistication and extensiveness of appraisal and product innovation than when internal variety is low. This suggests that managers need to create an environment within which learning is encouraged (a climate for learning supported by practical mechanisms such as secondments) along with means to encourage skill development and clarity of direction. The data suggest that there is a positive relationship between internal variety and innovation. When these mechanisms are combined with sophisticated appraisal systems that provide clarity of direction, identification of training needs and feedback on performance, the relationship is altogether stronger. It is combinations of people management practices rather than the application of individual practices that makes a difference to innovation in organizations. Similarly, much of the evidence presented in Chapter 1, exploring the relationship between HRM and performance, concludes that it is the combination and integration of practices which leads to positive outcomes, rather than particular interventions applied in isolation.

Similarly, when there is high internal variety in organizations there is a much stronger relationship between the sophistication and extensiveness of training in

organizations and innovation in technical systems than when the approach to training is unsophisticated. This supports again the interpretation that a combination of internal variety and skill development may be potent in encouraging innovation. Moreover, high internal variety in combination with weak approaches to training seems a worse combination (in terms of innovation in technical systems) than low internal variety and weak approaches to training. Whilst no specific hypothesis was presented to consider this possibility, the implications that it presents are nonetheless interesting. Firstly, a failure to train employees may lead to higher stress levels in situations of high variety since employees thus find themselves in situations of high demand (internal variety) and low control (low levels of skill development) – the opposite of the conditions that create ‘flow’ described above (Csikszentmihalyi & Sawyer 1995). These are instead the conditions which give rise to stress and failure to explore, create and learn (Beehr, 1995). Secondly, it is likely that through training and induction, organizational members gain a clearer insight into what knowledge, skills and attitudes are valued. Where there is a focus on innovation, articulated throughout induction and training, employees will be motivated to apply any knowledge that they acquire through being exposed to new experiences because they are clear that doing so will secure approval and reward. Finally, as outlined in Chapters 2 and 5, training and induction can enhance the team-building and communication skills of individuals, thus increasing the probability that knowledge will be shared within the immediate work-group and the wider organization.

When there are effective mechanisms in place to promote internal variety, there is a much stronger relationship between the sophistication and extensiveness of induction practices and product innovation than when such mechanisms are largely absent.

Moreover, effective mechanisms for promoting internal variety but without good induction is associated with *lower* levels of product innovation than when there are few mechanisms designed to promote internal variety and induction is poor. This may be because employees who encounter a complex environment with many opportunities for skill development are overwhelmed if the socialization process is not systematically handled, partly by the use of good induction procedures. As discussed in Chapter 2, such procedures are likely to provide important information about organizational goals, procedures and products making it more likely that employees can direct their energies towards appropriate and successful innovation (Brown & Duguid, 1991; Miller & Dollard, 1975). There is, in addition, theories concerned with managing the psychological contract suggest that where individuals believe that they will be expected to achieve rapid results through being encouraged to engage in exploratory learning activity, they will endeavour to perform in this way (Herriot & Pemberton, 1995). The theoretical case for this possibility is presented in Chapter 3. In essence, arguments suggest that in such circumstances, levels of anxiety are increased, and people are reluctant to move outside existing parameters. For these reasons, it is important that people believe that there is long-term support for learning at the highest levels of the organization. Such a commitment is communicated through the words and actions of the senior management team (Ashton & Felstead, 2001; Stern & Sommerlad, 1999).

Similar arguments apply when considering the relationship between measures of a strategic focus in people management activity, internal variety and innovation. I proposed in Chapter 5 that a strategic focus *per se* is important in generating the learning required to produce innovation. This is because such a focus enables employees to

acquire the skills necessary to establish a collaborative dialogue with one another. It ensures that a clear message is expressed to the effect that learning and supporting others in their learning is valued in the organization. The right type of strategic framework communicates that rewards- of a financial or non-financial nature- will be made available to those who make a conscious effort to listen actively to others, to provide appropriate and timely feedback and to act as coaches or mentors (Tyson 1997, Sparrow & Marchington, 1998, Storey 2001). Within such an environment, employees are able to share their knowledge with others and to respond positively to the suggestions made by the wider work group (Simon, 1991). A strategic focus in itself is a powerful driver for organizational learning (Bramham, 1996; Noe, Hollenbeck, Gerhart & Wright, 1994).

It is clear, however, that a particularly significant effect is generated where such a strategic focus is combined with an approach intended to enhance internal variety. The interaction between measurements of top management support for HR strategy and training is highly significant, accounting for 36% of the variance for innovation in technical systems. Why is this effect so pronounced? In the first chapter, I drew attention to a substantial literature that argues that there is a natural tendency for organizations to become better at what they are already doing, rather than to move into new and unexplored territories (Levinthal & March, 1993; March, 1991). Doing something new and different represents substantial risk. Mechanisms designed to expose individuals to new and different experiences and perspectives will yield uncertain returns. In order to derive positive benefit from the use of such mechanisms, it is necessary to make a commitment over time to their deployment. A strategic focus similar to that described above increases the likelihood that support and resources will be made

available to enable employees to engage in exploratory learning activity in the medium to long term (Leonard-Barton, 1998). This in turn increases the probability that such mechanisms will yield positive results, such as innovation.

### Conclusion

OL is generally a poorly defined term in the literature, with debate surrounding fundamental issues, for example, the extent to which it is a source of competitive advantage and whether and how it is possible to intervene in the process (March, 1993, Brown & Duguid, 1991). There are strong theoretical arguments supporting the idea that HR interventions will play a role in shaping the learning agenda and supporting innovation. Such arguments suggest that it is helpful for innovation to develop 'high performance' HR practices, with sophisticated approaches to training and performance management. In addition, theory suggests that practices designed to enhance absorptive capacity, boundary spanning and internal knowledge transfer do have a positive impact on organizational performance and innovative capacity (Cohen & Levinthal, 1992; McGrath, 2000; Nahapiet & Goshal, 1998). This study supports such propositions by showing that the way in which people are managed has an impact on the capacity of the organization to innovate.

This research suggests that it is important for technical innovation (innovation in technology and production processes) to ensure a combination of mechanisms designed to encourage high internal variety (secondments, customer visits, knowledge management, communication of best practice) along with sophisticated approaches to both induction and training. For product innovation, mechanisms designed to promote internal variety should be coupled with sophisticated and extensive appraisal systems.

The strengths of the study are similar to those outlined in the previous two chapters. The fact that prior levels of organizational innovation were controlled in the analysis is a significant strength of the study, making it possible to discount explanations of reverse causality (innovation led to changes in mechanisms designed to promote internal variety, appraisal, induction and training). Secondly, the design of the study makes it possible to control for the impact of extraneous variables such as size and profitability. The sample of organizations involved in this research is, however, small, so the findings, whilst striking, have to be interpreted with caution. Furthermore, and this limitation applies to studies presented in Chapters 4 and 5 also, I do not have a measure of organizational learning. My argument is that the both learning mechanisms and HR practices at strategic and operational level promote organizational learning, thus enabling organizations to produce relatively high levels of innovation. The argument would be considerably strengthened had it been possible to develop and implement a measure of organizational learning. I consider this theme in more depth in the final chapter of the thesis. Finally, the proposal in this and the previous studies is that organizational learning takes place where organizations make it possible for employees to experience variety and to develop team-working and communication skills. This perspective may represent only part of the overall picture, however. Perhaps one should also take into account employee attitudes, and consider whether employee motivation and/ or job satisfaction predicts learning and innovation performance. This possibility is considered in detail in the next chapter.

Further research is necessary in order to establish what particular features of the mechanisms considered in this study are significant in determining their effectiveness.

For example, what types of appraisal enhance learning and innovation performance?

Future research could explore the role of interventions designed to enhance variety and skills and examine whether developing variety or skills could be facilitated in other ways, for example, through the use of cross- functional team working or matrix structures. It would also be relevant to assess whether employee perceptions of work and the amount of control that they have impacts on OL. For example, what effect does their motivation to use opportunities created to develop skills and variety have on the process of organizational knowledge creation and innovation? A number of these questions are considered in chapters 7,8 and 9 of the thesis.

As I suggested in Chapters 1 and 2, innovation is vital for company performance and survival and understanding the factors that may influence innovation is therefore important if we are to understand how organizations can be most effective, be they manufacturing organizations, hospitals or schools. This study builds upon the framework and results reported in Chapters 4 and 5. It suggests that people management plays a fundamental role in creating an organizational environment that is conducive to learning and creativity. This happens as people experience variety, and as they receive feedback and clarity through sophisticated appraisal, training and induction.

## CHAPTER 7

### Job satisfaction and innovation

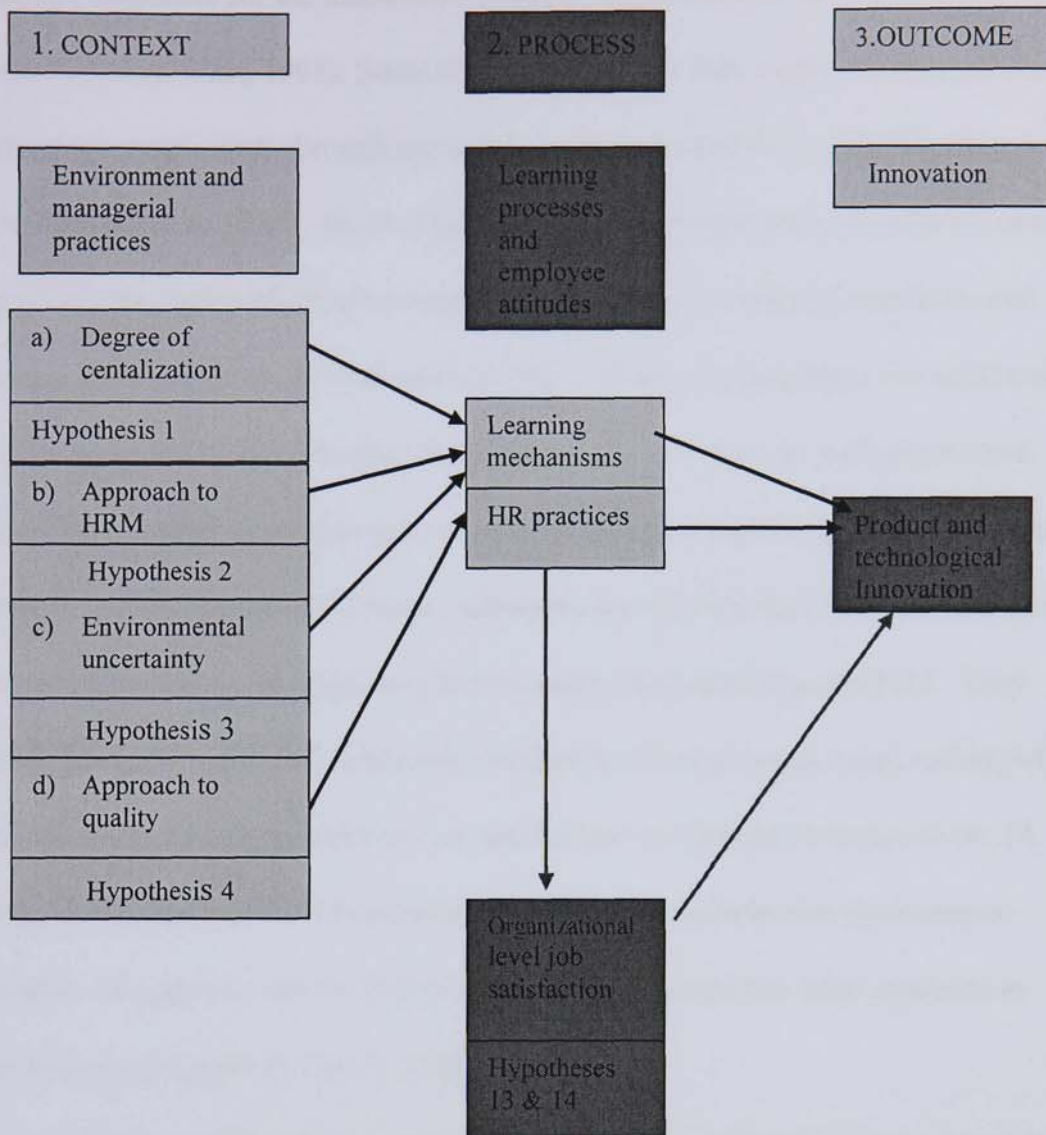
#### Introduction

The thesis so far has considered some ways in which people management practices have the potential to impact positively upon organizational learning. The theoretical framework suggests that exploratory learning takes place where opportunities are presented for individuals to experience variety and where practices are in place to provide direction and support for the development of skills. There is evidence, presented in chapters 4,5, and 6, to indicate that innovation results when opportunities are provided for individuals to experience learning of this kind.

There are two possible explanations for this effect. Firstly, the proposal is that the managerial interventions such as coaching and mentoring and appraisal generate organizational learning. Individuals who experience variety are able to contribute to the intuiting and interpreting stages of the process, and those who have highly developed interpersonal skills will ensure that knowledge is integrated and institutionalized. In other words, people produce creative outcomes where they have the knowledge and skills to facilitate organizational learning.

There is, however, an alternative explanation for these findings. It is reasonable to suggest that people who are engaged in learning activity will be positive in their approach to work. Perhaps when people experience job satisfaction, they will be able to generate more creative insights and be better at working with others than when no such attitudes are experienced. Job satisfaction may thus positively impact upon various desirable organizational outcomes, including innovation. The highlighted sections of the theoretical model presented below depict this possibility

## Model guiding the research



The argument debated above has strong face validity. The Human Relations school of thought takes as its basic premise the notion that employees who are treated well will perform better than those for whom little concern is manifested (see Gillespie, 1991). Much theory in organizational behaviour- for example, theories of job design

(Hackman & Oldham, 1976)- propose that ethical and humane approaches will yield not only positive outcomes for the individuals themselves, but also for the organization as a whole (Patterson & West, 1998). Some literature proposes that employee perceptions of satisfaction are maintained- through pro-active management of the psychological contract (Herriot & Pemberton, 1995). Hence, there is a large body of theory, particularly in the domain of people management, proposing that organizations seeking to perform well need to be concerned above all with maintaining or enhancing employee job satisfaction.

The empirical case for such a relationship is by no means so well established. A number of meta-analytical studies have concluded that the case for the job satisfaction/ performance relationship is fairly weak. Iaffaldano and Muchinsky (1985) concluded that the correlation between individual satisfaction and performance is around .17. They noted that this finding reflects conclusions reached by Vroom twenty years earlier, who reported the mean correlation between job satisfaction and job performance to be .14. They argued that 'the amount of empirical support for the satisfaction-performance relation does not approximate the degree to which this relation has been espoused in theories of organizational design' (p.270).

A recent meta-analytic review by Judge, Bono and Patton (2001) concluded more optimistically that employees' overall job satisfaction is on average correlated .30 with their work performance, a figure which they stated is 'not strong.... but would qualify as a moderate effect size' (p.388). Also, recent research exploring relationships between organizational-level job satisfaction and performance is promising. Evidence suggests that organizational-level job satisfaction predicts a range of performance outcomes, such as customer satisfaction, profitability and productivity. A study by Koys (2001), for example, showed that that organizational-level job satisfaction in the hotel and catering

industry had a positive impact upon customer satisfaction at a later point in time. Patterson, Warr & West (2003), also using a longitudinal research design, provided evidence to suggest that organization-level job satisfaction was significantly and positively associated with subsequent improvements in productivity in 42 UK manufacturing organizations. Ostroff (1992), in a cross-sectional study, found strong and positive relationships between organizational- level job satisfaction of teachers and student performance across 295 secondary schools in the US. The theoretical rationale for such a re-conceptualization of the satisfaction/ performance relationship is that positive outcomes are generated because where people experience job satisfaction they are more likely to work collaboratively together (George, 1996). A positive 'group affective tone' - may result in satisfied group members influencing the cognitive and creative capacities of the group as a whole (George, 1996). The underlying premise is that measuring satisfaction in terms of the individual fails to capture attributes and behaviours manifested when a group or even the organization as a whole experiences this state.

A number of re-conceptualizations of performance, as well as satisfaction, have emerged in recent years (Judge et.al., 2001). These involve measuring performance in terms of organizational citizenship behaviours (Bateman & Organ, 1988) and organizational spontaneity (George & Brief, 1992), for example. Few, if any, studies have addressed the relationship between satisfaction and innovation, however. Yet there is no empirical rationale for assuming that organizations seeking to produce innovation should adopt the same approach towards the management of employees as, say, organizations seeking to maximize profits. Neither is there necessarily an association between citizenship behaviours/ spontaneity and innovation. Organizations seeking to

produce innovation will need to facilitate learning and risk-taking behaviours, for example (cf Crossland, Lane & White, 1999). Furthermore, innovation cannot happen unless people have creative insights in the first place. So to what extent are people who experience positive affect more inclined and able to produce creative outcomes than those who do not report any such state of mind? And what implications does this have for organizational capacity to produce innovation?

A number of research studies conducted by Isen and colleagues show that people who are in a good mood tend to exhibit a range of creative and collaborative behaviours (Isen, Daubman & Nowicki, 1987; Isen & Baron, 1991). Research teams manipulated the mood of experimental groups in a variety of ways, for example, by offering individuals small gifts, or by presenting them with unexpected and pleasant surprises and/ or compliments. They then assessed the extent to which the ensuing good mood tended to predict outcomes such as recall of material, efficiency in making decisions, helpfulness and generosity to others, creative and innovative problem-solving and cognitive flexibility. Their findings suggest that positive mood does facilitate memory recall and increase the capacity of individuals to make (some kinds of) decisions. It also promotes greater concern for the well-being of others and predicts a capacity to perform well, or better than control groups, in tests designed to measure creativity. Substantial evidence was found to suggest that individuals experiencing good moods are more able to make associations between diverse stimuli than control groups and are thus better able to generate creative and unusual solutions to problems.

A number of provisos are attached to these conclusions, however. These research studies were conducted in a non-work setting and findings need not necessarily be replicated in the workplace, where a range of other complex factors such as relationships

with others and reward may influence mood- outcome associations. In addition, it is clear from these and other studies that whilst some findings suggest that good moods are positively associated with creative outcomes, other findings are not so clear-cut (Isen & Baron, 1991). There is evidence to suggest that individuals experiencing positive feelings may be reluctant to undertake tasks that are perceived to threaten the good mood that they experience cut (Isen & Baron, 1991). In addition, and for similar reasons, experimental work reveals that positive feelings can promote the over-simplification of complex tasks and a tendency to be less cautious than control groups when making high-risk decisions. Indeed, George and Zhou (2003) provide evidence to show that negative affect and dissatisfaction at work are more likely to predict creative outcomes than the converse. Those experiencing bad moods perceive that there is a mismatch between where they are and where they would like to be, and are, for this reason, inclined to put in extra effort to secure the outcomes that they seek. Research suggests that those experiencing good moods tend not to produce creative outcomes because they are confident with the work that they are producing and not inclined to put in further effort (George & Zhou, 2003). These findings were replicated in another study (Zhou & George, 2002) exploring the relationship between job dissatisfaction and creativity. The rationale is similar; employees experiencing job dissatisfaction will be active in dealing with perceived problems, and an active orientation will lead to demands for change. Such an active orientation will only be experienced in circumstances where individuals are committed to staying with the organization, where they perceive that they have voice and where they have supportive co-workers.

Much of the work conducted in this area is cross-sectional, and therefore does not consider the possible effect of the achievement of creative outcomes upon mood or

satisfaction. For example, it seems likely that those who are dissatisfied, and who achieve the change that they seek, will become satisfied as a result of doing so. One could hypothesize that in such circumstances, individuals will be more, rather than less, inclined to produce creative outcomes. This is clearly a question to be resolved through further research.

It is also possible that the negative relationships between affect and creative performance alluded to above may be counteracted when one considers satisfaction at the level of the organization. Research shows, for example, that the relationship between organizational level job satisfaction and customer satisfaction, productivity and profitability is positive (Patterson, Warr & West, in press). This may particularly be the case where organizations are seeking to produce innovation- when it is imperative that people collaborate and work together to develop new ideas. There is some theoretical support for this notion, expressed in detail in the second chapter. For example, ideas to do with 'group affective tone' (George, 1996) propose that the creative outcomes resulting from individual positive affect are amplified where these feelings are exhibited by a significant proportion of the work group. I thus argue that there will be a positive relationship between organizational-level job satisfaction and innovation. This will be the case particularly where it is possible to measure the impact of job satisfaction upon innovation over the course of time. The broad proposition guiding this research study was presented in Chapter 2, as follows: -

Hypothesis 13: There will be a significant and positive relationship between organizational-level job satisfaction at one point in time and innovation at a later point in time.

Given the research noted above, which shows that job dissatisfaction, rather than satisfaction, may lead to creative outcomes in certain circumstances (George & Zhou, 2003; Zhou & George, 2002), perhaps one needs to explore employee perceptions of the work environment in order to understand more fully the context in which job satisfaction will predict innovation. Perhaps job satisfaction results in creative outcomes only where employees perceive that the workplace offers them opportunities for learning and development. In order to show that this may be the case, I need to show, firstly, that particular aspects of the work environment present opportunities for learning and development (i.e. are associated with the production of innovation), and secondly, that employees particularly value these aspects of the work environment.

There are a number of aspects of the work environment that may facilitate learning and growth. In summary, literature considered in the first two chapters proposes that learning takes place where individuals are exposed to variety and where they have the opportunity to develop skills. There is a case for arguing that autonomy, climate for innovation/ flexibility and participation are variables that represent opportunities for individuals to experience variety. Where people have autonomy, for example, they are required to find out solutions to problems themselves and may thus be motivated to look for alternative ways of working. Many theories of job design propose such exposure to variety is highly motivating (e.g. Hackman & Oldham, 1976). The experience of autonomy can also have a direct effect on performance; for example, Jackson & Wall (1991) showed that operators experiencing autonomy were better at preventing problems on production lines from occurring than those not experiencing such a state. Similarly, those operating within a climate supportive of innovation will be frequently exposed to the ideas of others, and thus likely to see the need for creativity and learning and to attach

high value to such activities (cf Amabile, Conti, Coon, Lazenby & Herron, 1996).

Training, for example, is highly valued by employees because it develops skills and is thus likely to have a direct impact on individuals' capacity to perform a task and the fulfillment that they derive from doing so (Harel & Tzafrir, 1999). In order to measure the impact of these variables upon outcomes (i.e. innovation), one needs to allow sufficient time for individuals to adjust to the opportunities presented in this way and to effect behavioural change.

There is some debate about the extent to which employee perceptions of organizational climate (or work environment), and job satisfaction are indeed separate constructs. There is an argument for suggesting that employees who profess themselves to be satisfied at work will tend to refer positively to most aspects of organizational climate because of the feelings that they experience about work and the organization (see James, 1982). In other words, it is difficult to separate descriptive and evaluative perceptions (Guion, 1973). Other research shows that employees experience job satisfaction where they attach particular value to aspects of climate that are highly rated (Patterson, Warr and West, 2003). There is thus a theoretical and empirical rationale for proposing that employees who are committed to learning and to generating creative outcomes will attach particular value to those aspects of climate that they believe best enable them to make such a contribution. I propose that where organizational climate is perceived to offer opportunities for experiencing variety and for developing skills, job satisfaction will be higher than when these features are not present. This makes sense, since it would suggest that job satisfaction is derived from inherent interest in the job itself, rather than from a general and passive acceptance of the status quo. So where

organizational climate promotes learning, employees may experience the positive affect most likely to promote creativity (cf Isen & Baron, 1991).

I proposed in Chapter 2 that ‘there will be a positive relationship between aspects of the work environment which tend to promote learning and growth (such as autonomy and training) and innovation. This effect will be mediated by job satisfaction’.

(Hypothesis 14). In order to demonstrate that there is a close relationship between these aspects of climate and job satisfaction, it is necessary to show that climate variables for training, autonomy and for perceptions of organizational support for flexibility/innovation are positively related to innovation. This effect would be mediated by job satisfaction. I thus present specific hypotheses derived from the broad proposition noted above, as follows: -

#### Hypothesis 14(a)

Variables measuring autonomy and will be significantly and positively associated with technological innovation, mediated by job satisfaction.

#### Hypothesis 14 (b)

Variables measuring climate for innovation/ flexibility will be significantly and positively association with technological innovation, mediated by job satisfaction.

#### Hypothesis 14 (c)

Variables measuring training will be significantly and positively association with technological innovation, mediated by job satisfaction.

Cross sectional designs are not altogether satisfactory when seeking to establish the effect of one set of variables upon a particular outcome. Although correlations across one point in time can provide some important indicators of associations, such designs do not rule out the possibility that the directionality of any relationship is the opposite to that

predicted; for example, rather than job satisfaction predicting innovation, perhaps the innovation itself denotes that higher levels of job satisfaction will be experienced. The case for causality can be more strongly argued where a longitudinal design is employed. Such a design makes it possible to show that prior innovation (e.g. the rate and magnitude of innovation at Time 1) has no significant bearing upon innovation at Time 3. This strengthens the case for arguing that job satisfaction (measured at Time 2) was significant in predicting Time 3 innovation.

## Method

### Sample and procedure

Data were derived from 30 manufacturing organizations in the United Kingdom, by means of two surveys: the first, at Time 1, was an employee attitude survey, the second, at Time 2, was an in depth survey of the rate of innovation. Fifteen of the organizations in the sample were engaged in engineering-related activities, eight were in the plastics and rubber industry, two in the food and drink industry and two fitted into the miscellaneous category. The attitude survey is described in detail below; details relating to the innovation survey can be found in Chapter 4. Data from the employee attitude survey could only be used where corresponding data existed for the two innovation surveys. Hence the sample is not identical to that described in earlier studies, although there are substantial overlaps. Twenty-one organizations from the sample presented in chapter 5 are represented in this study. I also drew upon data provided by a further nine organizations, which provided information on employee attitudes and innovation, so that a total sample of 30 organizations form the basis of this study.

When measuring employee attitudes it was important to ensure that, as far as possible, employees were describing an environment that was experienced in a similar

way. This was particularly the case because the research methodology required the compilation of a mean score for each organization relating to climate and to job satisfaction. Differences in employee perceptions of climate can occur various ways, for example, in large organizations employees will be influenced by diverse policies and practices which will effect how they rate aspects of climate measured (see James, 1982). It was therefore important to ensure that each organization was comparable with the others in the sample, in terms of size and degree of centralization. This made it possible to arrive at a score which accurately depicted the aggregate of employee attitudes within that environment.

For the attitude survey, 100% of employees were approached in 26 of the organizations included in this study. For larger organizations, a random sample of 500 employees (n=4) was asked to complete forms. The questionnaire surveys were either distributed to employees by a nominated representative from the organization or handed to employees on-site by a member of the research team. A letter explaining the project together with a pre-paid envelope addressed to the appropriate member of the research team was included with the questionnaire. Individuals were told that their names would not under any circumstances be divulged. 3717 employees returned completed questionnaires, representing a response rate of 63.9%.

#### Independent variables

**Job satisfaction:** It was important to use a measure of job satisfaction that was readily understandable, particularly since many of the individuals in the survey did not have a high level of educational attainment. It was also imperative that the questionnaire was not too time-consuming to complete, since people needed to make a commitment to returning completed questionnaires. A scale developed by Warr, Cook and Wall (1979) was used

for this purpose. It is a 15- point questionnaire, asking people how satisfied or dissatisfied with features of their jobs, such as ‘the recognition you get for good work’, ‘the attention paid to suggestions you make’, ‘the opportunity to use your ability’ and ‘relationships between management and workers in the organization’. Responses are provided on a 7-point scale, ranging from ‘extremely dissatisfied’ to ‘extremely satisfied’. The internal reliability of the job satisfaction scale, assessed using Cronbach’s alpha, was .92. In order to establish a measurement for organizational-level job satisfaction, a mean was calculated using the individual job satisfaction measures to give a total score for each organization for the experience of this attitudinal state.

**Organizational climate:** The competing values model, proposed by Quinn and Rohrbaugh (1983) was used to develop the scales for employee climate. This model shows how organizations are subject to competing pressures, firstly, as they interact with the external environment, whilst also seeking to establish effective internal ways of operating, and secondly, as they focus upon developing human resources, as opposed to controlling performance. Seventeen items were developed to tap aspects of climate relating to the four sets of organizational values: human relations, rational model, open systems and internal process. Not all of the climate variables were drawn upon for this study. There is a strong theoretical rationale, considered in the first two chapters, to indicate that innovation is produced where organizations exhibit an orientation towards ‘open systems’ and/ or ‘human relations’ values. The process of engaging in interaction with the external environment facilitates the acquisition of knowledge. Where organizations exhibit a tendency to invest in the development of staff, such knowledge can be put to effective use. I therefore drew upon climate variables which measured whether or not employees perceived that the organization encouraged them to engage

with the external environment, and whether it was seen to be concerned with the their development. The following scales were thus considered in the study: autonomy, participation, and climate for flexibility/ innovation, departmental co-operation, training, reflexivity and customer orientation. Through autonomy, participation, departmental co-operation and training, employees are presented with opportunities for development. A climate for flexibility/ innovation, reflexivity and a customer orientation ensures that the necessary engagement with the external environment takes place.

#### Dependent variables

Full details of the methods used for gathering data for the innovation survey are provided in chapter 4 and summarized in chapters 5 and 6. To re-iterate the main points: - **Innovation in products:** respondents gave estimates of the number of entirely new and adapted products developed in the last two years; percentage of production workers involved in making the new products; current sales turnover accounted for by the new products; and the extent to which production processes had been changed to accommodate the new products.

**Innovation in production technology:** Production technology changes included the introduction of new machines or systems such as single cycle automatics, CNC and robots. Respondents listed the three most significant changes in this category introduced over the previous two years. They also gave estimates of the magnitude and novelty of the change for their organization on a three-point scale, ranging from 1 -- “minor”, through 2 -- “moderate”, to 3 -- “major”. Further questions concerned the percentage of production workers requiring retraining to use the different technology, and the proportion of the total production process incorporating the technology.

**Innovation in production techniques/procedures:** This section focused on such changes as the introduction of scheduling and planning systems (e.g. MRP II), Just-In-Time (JIT) management or Total Quality Management (TQM). The questions took the same form as that described above for changes in production technology.

**Innovation in technical systems:** This represents the researcher's perception of the extent to which the organization engaged in technical innovation. In order to arrive at a score, researchers took into account responses made in all three of the areas detailed above. This category thus represents the informed perception of the researcher of the overall commitment to technical innovation exhibited in relation to an organization's products, its technology and its processes. The questions took the same form as that described above for the other types of innovation.

#### Control variables

Controlling for size, profitability and prior innovation allowed me to establish whether or not any relationships between the independent and dependent variables were attributable to control variables.

The companies ranged in size from 70 to 1150 employees. It was possible that there might be higher levels of innovation in larger organizations, perhaps as a result of the availability of additional resources, therefore it was important to control for organizational size. Performance was calculated by analyzing company financial accounts, and dividing the total figure for each organization by the number of employees. The possibility to be controlled for concerned whether or not high levels of profitability impacted on rates of innovation, perhaps because, again, of the effect of additional resources being available. Finally, I controlled for prior innovation. By doing so I was

able to ascertain the extent to which high levels of innovation at the third point in time was related to levels of innovation at a time 1.

#### Analytical approach

Climate variables taken at Time 2 were entered separately into a regression, using all four measures of Time 3 innovation (in products, technology, processes and technical systems) as dependent variables. As outlined above, I controlled at Time 1 for prior innovation, organizational size and profitability and took these variables into account in the regression analysis. The same procedure was adopted for organizational-level job satisfaction (measured at Time 2). There was approximately one year between each time measurement point. In order to demonstrate that there was a close relationship between aspects of the work environment which tend to promote learning and job satisfaction, I needed to show that climate variables for autonomy, training and perceptions of flexibility/ innovation were positively related to innovation performance. This effect would be mediated by job satisfaction were this to be the case. Thus, when the preliminary analysis had been conducted as detailed above, each significant climate variable was entered jointly into a regression together with the measure of organizational-level job satisfaction. As described on page 249, the criteria for mediation by job satisfaction were taken to be, firstly a substantial reduction of the beta-weight of an initially significant climate scale after inclusion of the potential mediator (job satisfaction) and, secondly, a significant beta coefficient for that mediator (job satisfaction) in the final analysis. A commonly used convention suggests that the significant contribution of the climate variable should be rendered non-significant after job satisfaction has been entered into the regression (Patterson, Warr & West, in press). This was the approach adopted for this analysis.

### Reliability of scales

To establish discriminant validity of the seven climate scales, they were entered into a confirmatory factor analysis with the seven factors allowed to correlate. The results were satisfactory: Chi squared (573 df)= 3352.7; the comparative fit index (CFI) was 0.915; the Tucker-Lewis index (TLI), or non-normed fit index (NNFI) was 0.906, and the root mean square error of approximation (RMSEA) was 0.051. Sample items for a climate for innovation/ flexibility are: 'People here co-operate to help develop and apply new ideas'; for autonomy: 'Management here trust people to take work-related decisions without getting permission first', for training: 'People are strongly encouraged to develop their skills'. Four response alternatives were provided (definitely false, mostly false, mostly true and definitely true) and items from different scales were intermingled in the questionnaire.

### Results

Means, standard deviations and correlations are reported in Table 1. Significant and positive statistical correlations were observed between job satisfaction and innovation in products, technical systems and production technology ( $\beta = .50$ ,  $p < .001$ ,  $\beta = .67$ ,  $p < .001$ ,  $\beta = .64$ ,  $p < .001$  respectively). In addition, significant or very significant correlations were found between many of the climate variables and various types of

innovation. For example, the correlation for climate for autonomy and innovation in technical system was significant ( $\beta = .39, p < .05$ ).

Table 1 : Means, Standard deviations and correlations for all study variables

|   | Mean | SD   | 1.    | 2.    | 3.    | 4.    | 5.  | 6.    | 7.    | 8.    | 9.    | 10.   | 11.   |
|---|------|------|-------|-------|-------|-------|-----|-------|-------|-------|-------|-------|-------|
| 1. Job satisfaction T2                    | 4.52 | .37  |       |       |       |       |     |       |       |       |       |       |       |
| 2. Product innovation T3                  | 3.11 | 1.44 | .50** |       |       |       |     |       |       |       |       |       |       |
| 3. Innovation in production technology T3 | 2.90 | 1.09 | .67** | .47** |       |       |     |       |       |       |       |       |       |
| 4. Innovation in technical systems T3     | 3.20 | .80  | .64** | .73** | .64** |       |     |       |       |       |       |       |       |
| 5. Innovation in production processes T3  | 3.14 | 1.27 | .19   | -.07  | .09   | .48** |     |       |       |       |       |       |       |
| 6. Auton. T2                              | 2.33 | .19  | .34   | .28   | .23   | .39*  | .31 |       |       |       |       |       |       |
| 7. Particip. T2                           | 2.32 | .29  | .68** | .32   | .36   | .51** | .37 | .675* |       |       |       |       |       |
| 8. Training T2                            | 2.56 | .28  | .81** | .35   | .50** | .50** | .19 | .49*  | .76** |       |       |       |       |
| 9. Dept. co-op. T2                        | 2.31 | .29  | .50** | .24   | .35   | .36   | .27 | .29   | .69** | .58** |       |       |       |
| 10. Flex./ Inn T2                         | 2.54 | .22  | .59** | .53** | .34   | .51** | .11 | .20   | .65** | .55** | .62** |       |       |
| 11. Reflexivity T2                        | 2.64 | .21  | .48*  | .24   | .31   | .41*  | .23 | -.03  | .63** | .53** | .66** | .81** |       |
| 12. Customer focus T2                     | 3.17 | .34  | .54** | .26   | .42*  | .32   | .04 | -.21  | .25   | .42*  | .26   | .25   | .62** |

\*p&lt; .05; \*\* p.01; \*\*\* p&lt;.001; n=30

Turning to job satisfaction and its relationship with innovation, Table 2 shows that the relationships suggested by the data presented in Table 1 were generally supported in regression analyses, taking into account control variables. Job satisfaction at the first measurement point predicted innovation in technical systems two years later ( $\beta = .66$  ( $p < .01$ )). Furthermore, job satisfaction explained some 34% of the variance against this dependent variable. Statistically positive relationships were found between job satisfaction and product innovation ( $\beta = .40$ ,  $p < .06$ ,) and also job satisfaction and innovation in production technology ( $\beta = .73$ ,  $p < .001$ ). Job satisfaction accounted for 41.5% of the variance against innovation in production technology. This data present substantial support for Hypothesis 13, that there will be a positive relationship between organizational-level job satisfaction and product and technological innovation.

Table 2

Summary of Hierarchical Regression of Product Innovation and Innovation in Technical Systems onto Job Satisfaction

| Independent variables  | Product innovation<br>T3 |              |                       | Innovation in technical systems<br>T3 |              |                       |
|------------------------|--------------------------|--------------|-----------------------|---------------------------------------|--------------|-----------------------|
|                        | $\beta$                  | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                               | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls<br>T1         |                          |              |                       |                                       |              |                       |
|                        |                          | .28          | .04                   |                                       | .13          | .02                   |
| Job satisfaction<br>T2 | .40                      | .11          | .09                   | .66**                                 | .44          | .38                   |

\*p&lt; .05; \*\* p.01; \*\*\* p&lt;.001; n=30

Table 3

Summary of Hierarchical Regression of Innovation in Production Processes and Innovation in Production Technology onto Job Satisfaction

| Independent variables | Innovation in production processes |              |                       | Innovation in production technology |              |                       |
|-----------------------|------------------------------------|--------------|-----------------------|-------------------------------------|--------------|-----------------------|
|                       | $\beta$                            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                             | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls              |                                    | .10          | .01                   |                                     | .15          | .04                   |
| Job satisfaction      | .39                                | .12          | .10                   | .73***                              | .42          | .45                   |

\*p< .05; \*\* p.01; \*\*\* p<.001; n=30

A different pattern emerged when the climate variables were entered into a regression, taking account of control variables. Departmental co-operation, reflexivity and customer orientation and participation became non-significant at this point for all types of innovation. Only three aspects of climate remained significant: autonomy, climate for flexibility/ innovation, and training and most of the relationships are observed in relation to innovation in technical systems. For example, entered separately into a regression, autonomy accounted for 11.9% of the variance in innovation in technical systems ( $\beta = .38, p < .05$ ). Also entered separately, climate for flexibility/ innovation explained 12.3% of the variance in innovation in technical systems ( $\beta = .40, p < .05$ ) and training accounted for 14.9% of variance against the same dependent variable ( $\beta = .50, p < .05$ ). The relationships between these variables and other types of innovation are depicted in tables 4 and 5.

Table 4

Summary of Hierarchical Regression of Product Innovation and Innovation in Technical Systems onto Autonomy, Climate for Innovation/ Flexibility and Training

| Independent variables               | Product innovation |              |                       | Innovation in technical systems |              |                       |
|-------------------------------------|--------------------|--------------|-----------------------|---------------------------------|--------------|-----------------------|
|                                     | $\beta$            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                         | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls                            |                    | .28          | .18                   |                                 | .13          | .02                   |
| Autonomy                            | .37*               | .13          | .11                   | .38*                            | .14          | .12                   |
| Controls                            |                    |              |                       |                                 |              |                       |
| Climate for flexibility/ innovation | .38                | .27          | .18                   | .40*                            | .13          | .02                   |
|                                     |                    | .16          | .16                   |                                 | .14          | .12                   |
| Controls                            |                    | .28          | .18                   |                                 | .13          | .02                   |
| Training                            | .28                | .05          | .02                   | .50*                            | .16          | .15                   |

\*p< .05; \*\* p.01; \*\*\* p<.001; n=30

Table 5

Summary of Hierarchical Regression of Innovation in Production Processes and Innovation in Production Technology onto Autonomy, Climate for Innovation/ Flexibility and Training

| Independent variables               | Innovation in production processes |              |                       | Innovation in production technology |              |                       |
|-------------------------------------|------------------------------------|--------------|-----------------------|-------------------------------------|--------------|-----------------------|
|                                     | $\beta$                            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                             | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls                            |                                    | .15          | .04                   |                                     | .15          | .04                   |
| Autonomy                            | .38*                               | .04          | .01                   | .20                                 | .04          | .01                   |
| Controls                            |                                    |              |                       |                                     |              |                       |
| Climate for flexibility/ innovation | .38                                | .10          | -.01                  | .25                                 | .15          | .04                   |
|                                     |                                    | .02          | -.04                  |                                     | .06          | .03                   |
| Controls                            |                                    | .28          | .18                   |                                     | .13          | .02                   |
| Training                            | .28                                | .05          | .02                   | .50*                                | .16          | .15                   |

\*p< .05; \*\* p.01; \*\*\* p<.001; n=30

### Job satisfaction as a mediator

As detailed above, tables 3- 6 represent relationships between aspects of climate and (most types of) innovation. Those aspects of climate found to be positively associated with innovation are autonomy, climate for innovation/ flexibility and training. These findings are not in themselves the subject of formal hypotheses because the focus of this study was job satisfaction and its relationship to innovation. They are nonetheless important because they provide contextual information about the environment most likely to promote job satisfaction. In other words, given the magnitude of the relationship between job satisfaction and innovation, the next step was to establish whether or not job satisfaction had any mediating effect upon the significant climate variables noted above and innovation.

The criteria for mediation by job satisfaction were taken to be, firstly, a substantial reduction of the beta weight of an initially significant climate scale after inclusion of the potential mediator (job satisfaction), and, secondly, a significant beta coefficient for that mediator (job satisfaction) in the final analysis. It is not clear what magnitude of reduction one would need to find in order to claim mediation. A commonly used convention suggests that the significant contribution of the climate variable should be rendered non-significant after job satisfaction has been entered into the regression (Patterson, Warr & West, 2001).

The findings are presented in table 6-8. It can be seen that, in relation to autonomy and job satisfaction, autonomy was significant ( $\beta=.38$ ,  $p<05$ ) when entered alone into the regression, explaining, as detailed above, 11.9% of the variation in

innovation in technical systems. However, entered jointly with job satisfaction, autonomy ceased to be significant. Job satisfaction remained highly significant, accounting for 19.9% of the variance. Autonomy, input together with job satisfaction, explained 4% of the variance, representing a beta-weight decline of approximately 66%. This percentage decline in beta-weights between steps 2 and 3 appears to reflect almost full mediation by overall job satisfaction in the case of autonomy.

The patterns were more pronounced in relation to climate for flexibility/innovation. This variable entered alone accounted for 11.9% of the variance in innovation in technical systems ( $\beta = .38, p < .05$ ). However, entered into a regression with job satisfaction, the (adjusted)  $r^2$  declined to -.02. Job satisfaction remained highly significant ( $\beta = .60, p < .01$ ). The percentage decline in beta-weights between steps 2 and 3 appeared to reflect full mediation by overall job satisfaction in the case of this climate variable.

Whilst these findings were striking in relation to innovation in technical systems, this pattern was not found when the other types of innovation were taken into account. Training was the only exception to this general finding. As shown in table 10, job satisfaction fully mediates the relationship between training and innovation in technical systems as well as training and innovation in production technology. However, the findings in relation to training have to be interpreted with caution. This variable was highly correlated with job satisfaction ( $\beta = .84^{***}$ ), above the .7 figure usually taken to denote multi-collinearity. Therefore, limited conclusions can be drawn from the findings presented in table 10.

Table 6

Summary of Hierarchical Regression Showing the Mediating Effect of Job Satisfaction upon the Relationship between climate for Autonomy and Innovation in Technical Systems.

| Innovation in technical systems |                      |              |  |              |                                       |                       |
|---------------------------------|----------------------|--------------|--|--------------|---------------------------------------|-----------------------|
|                                 | Step 1<br>(controls) |              | Step 2<br>(Variables entered separately) |              | Step 3<br>(Variables entered jointly) |                       |
|                                 | $\beta$              | $\Delta R^2$ | $\beta$                                  | $\Delta R^2$ | $\beta$                               | Adjusted $\Delta R^2$ |
| Controls                        |                      | .07          |  | -.10         |                                       |                       |
| Job satisfaction                |                      |              | .66**                                    | .44          | .58**                                 | .45                   |
| Autonomy                        |                      |              | .39*                                     | .14          | .20                                   | .06                   |
|                                 |                      |              |  | .12          |                                       | .04                   |

\*p< .05; \*\* p.01; \*\*\* p<.001; n=30

Table 7

Summary of Hierarchical Regression Showing the Mediating Effect of Job Satisfaction upon the Relationship between climate for Flexibility/ Innovation and Innovation in Technical Systems.

| Innovation in technical systems     |              |                       |  |              |                       |                                       |              |                       |      |
|-------------------------------------|--------------|-----------------------|--|--------------|-----------------------|---------------------------------------|--------------|-----------------------|------|
| Step 1<br>(Controls)                |              |                       | Step 2<br>(Variables entered separately) |              |                       | Step 3<br>(Variables entered jointly) |              |                       |      |
| $\beta$                             | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                                  | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                               | $\Delta R^2$ | Adjusted $\Delta R^2$ |      |
| Controls                            | .07          | -.10                  |  |              |                       |                                       |              |                       |      |
| Job satisfaction                    |              |                       | .66**                                    | .44          | .38                   | .60*                                  | .34          |                       | .36  |
| Climate for flexibility/ innovation |              |                       | .40*                                     | .14          | .12                   | .12                                   | .01          |                       | -.02 |

\*p< .05; \*\* p.01; \*\*\* p<.001; n=30

Table 8

Summary of Hierarchical Regression Showing the Mediating Effect of Job Satisfaction upon the Relationship between Training and Innovation and Innovation in Technical Systems.

| Innovation in technical systems    |              |                       |  |              |                       |                                       |              |                       |
|------------------------------------|--------------|-----------------------|--|--------------|-----------------------|---------------------------------------|--------------|-----------------------|
| Step 1<br>(Controls)               |              |                       | Step 2<br>(Variables entered separately) |              |                       | Step 3<br>(Variables entered jointly) |              |                       |
| $\beta$                            | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                                  | $\Delta R^2$ | Adjusted $\Delta R^2$ | $\beta$                               | $\Delta R^2$ | Adjusted $\Delta R^2$ |
| Controls                           | .13          | .02                   |  |              |                       |                                       |              |                       |
| Job satisfaction                   |              |                       | .66**                                    | .44          | .38                   | .72*                                  | .34          | .38                   |
| Climate for flexibility/innovation |              |                       | .50*                                     | .16          | .15                   | -.08                                  | .00          | -.03                  |

\*p< .05; \*\* p.01; \*\*\* p<.001; n=30

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market is volatile. They may enjoy the status of being part of a large organization that is a major employer in the area. Such perceptions may or may not be articulated, but nonetheless will have a profound influence both on peoples' commitment to the organization and on levels of job satisfaction. It is hard to envisage, however, that there will necessarily be a positive association between job satisfaction that is derived from the factors noted above (which are by no means exclusive) and learning, creativity and innovation. Indeed, the opposite argument may apply. Perhaps people who have a need for high levels of security, and who perceive that their needs in this respect are met, will be less inclined to support initiatives designed to promote change than those who profess themselves to be dissatisfied with work. There is a need for more research in this area, but it seems at least possible that employees experiencing this type of 'passive' job satisfaction may in fact actively resist change because of the threat that it poses to a state that is very important to them, i.e. security. So it is important to take into account the context in which the job satisfaction occurs when establishing whether or not this attitude is likely to be related to positive organizational outcomes.

This study has a number of theoretical implications for those concerned with managing creativity, learning and innovation in the workplace. It provides broad support for the idea that organizations whose members experience job satisfaction are more creative and more inclined to produce innovation than where the converse applies. This is an important finding, especially given the limited research that currently exists to address this point. The study also suggests that job satisfaction predicts innovation where employees attach particular value to those aspects of the work environment that promote learning and growth. The empirical analysis shows that job satisfaction mediates the

relationship between autonomy and innovation, for example. This finding implies that one can understand the relationship between job satisfaction and innovation only where one has some understanding of the context in which job satisfaction is reported.

The study also provides evidence to suggest that it makes sense to take an organizational, rather than an individual, perspective of job satisfaction. Perhaps where the majority of employees in an organization experience job satisfaction, some of the limitations associated with individual measurements of job satisfaction can be to some extent ameliorated. For example, there is evidence to suggest that those who experience positive affect are reluctant to engage in activities that represent a threat to their state of mind (cf Isen & Baron, 1991). Perhaps where job satisfaction is experienced at group or organizational level, social influences prevent individuals from exhibiting such avoidance strategies.

In terms of practical applications, people will attach value to opportunities for learning and growth when they believe that the organization will recognize and reward their involvement in such activities. Therefore, it is important for people management practitioners and other managers to consider the ways in which the organization recognizes and rewards those who make the most of opportunities presented for learning and growth. It also makes sense for organizations to consider how to design jobs in a way that enables individuals to experience the motivating effects being exposed to a variety of perspectives, whilst simultaneously developing the skills to enable them to apply any learning acquired in this way.

People management issues are generally neglected by the organizational learning literature. Where proposals are made to enhance individual learning, for example,

through designing jobs differently or through providing training opportunities for employees, motivational issues are rarely considered. Yet research suggests, firstly, that people experiencing high levels of intrinsic motivation will exhibit energy and persistence in the fulfillment of tasks (Amabile, 1983; 1988), and secondly that such attitudes may be amplified in a group setting (George, 1996). This suggests that those concerned with managing learning in organizations should pay particular attention to the way in which work groups operate and the extent to which they present a supportive environment for learning and innovation. Further research is required in order to develop a clearer framework for understanding the processes whereby groups with positive affective tone support the learning of their members.

### Conclusion

Overall, this study suggests that interventions designed to promote learning have an effect on creative outcomes in two ways. Firstly, effective interventions of this kind present opportunities for people to acquire and apply knowledge. Much of the learning organization/ organizational learning literature has adopted this perspective, which has been considered empirically in Chapters 4, 5, and 6. Secondly, where opportunities for learning are presented and are valued by employees, high levels of motivation will be experienced. This, in turn, may engender 'collective affect'. There are many important ways in which collective affect is a helpful attitudinal state for groups and organizations seeking to produce innovation.

Many of the limitations associated with this study are similar to those noted for the previous three chapters. The sample size for this study is relatively small (30 organizations), so any conclusions need to be interpreted with caution. It is impossible to

rule out the effect of extraneous factors, although the research design, being longitudinal, makes the case for causality stronger, especially since it has been possible to control for prior innovation. As was the case for the earlier studies, measurements for independent and dependent variables draw upon different sources, thus adding to the credibility of the conclusions derived. A potential weakness in the research design unique to this study is the measurement of employee attitudes and job satisfaction and their treatment as separate constructs. Statistically significant relationships exist between many of the climate variables and job satisfaction, as can be seen in Table 1. The advice in such situations is to interpret with caution any statistically significant correlations above .7. In this study, autonomy is not correlated with job satisfaction; other climate variables (participation and climate for flexibility/ innovation) are significantly correlated, but less than .7. The only exception is training, and this potential limitation is clearly pointed out in the analysis section.

Perhaps more importantly in relation to the overall thesis, it has been impossible to establish empirically whether the learning mechanisms referred to in subsequent chapters predict organizational-level job satisfaction. I did not have a measure of job satisfaction taken after the learning mechanisms data had been collected. This study does not therefore fit into the model presented in Chapter 2 as neatly as it may have done had I been able to analyze this relationship. However, the findings are strong enough to make it feasible to derive logical hypotheses from the study. For example, it is reasonable to assume that where employees value autonomy and participation, they will also attach value to mechanisms designed to promote variety and to develop skills. It is thus possible to present an overall rationale for the approach adopted.

Further research needs to establish by what mechanisms collective affect generates creative outcomes. For example, do individuals who are part of a group experiencing positive affective tone become more creative as a result? Does this mean that some of the limitations associated with positive affect at individual level are ameliorated? Perhaps also where groups or indeed organizations experience high affective tone, they are willing to accept that individuals will make mistakes and committed to ensuring that damaging consequences do not result from this. In other words, it would be relevant and useful to consider to what extent members of groups with positive affective tone experience 'psychological safety' (Edmondson, 1996).

Finally, further research needs to consider, in more depth than has been possible in this study, the relationship between perceptions of the work environment, collective affect and creative outcomes. It would be interesting, for example, to explore the extent to which peoples' experience of autonomy, participation and training generates intrinsic motivation. Is there a difference between the creative outcomes of individuals who are motivated in this way and those who experience positive affect because they attach value to the security aspects of their employment, for example?

The implications of this study for this thesis are two-fold. Firstly, it provides evidence to support the central premise of the thesis, which is that those with responsibility for people management have a significant role to play in developing organizations able to produce creative outcomes. The work environment can be shaped so that people have a sense of control in their jobs, and are able to participate in decision-making, for example. Secondly, whilst I was unable to build directly upon the studies outlined in previous chapters, this study does suggest that learning mechanisms will

achieve positive results where they are highly valued by employees. Therefore, organizations, and people management practitioners in particular, need to consider how they can create an environment where learning is valued and where there is a general sense of satisfaction at work. It thus makes sense in business terms to establish ways of enhancing job satisfaction, particularly where it can be shown that employees attach value to any interventions introduced.

It is more important than ever before that organizations are able to respond rapidly to demands presented by the external environment. This study shows that there is a positive association between organizational-level job satisfaction and subsequent innovation. It thus makes sound business sense to manage the work environment, and take note of employee perceptions of the work environment and of the job satisfaction that they exhibit, in order to foster learning, creativity and innovation.

## CHAPTER 8

### Ricoh (Telford) and Raychem UK: a comparative study

#### Introduction

The next two chapters are qualitative studies that focus upon two similar manufacturing organizations. The intention is to explore in some depth how these organizations manage learning and to compare the extent to which they succeed in creating a vibrant, dynamic workforce capable of sustaining change and innovation. This chapter gives background on both organizations. It briefly details the methodological framework for the two studies and considers the challenges implicit in the external environment, and the implications thus presented for the management of learning and innovation. The next chapter (Chapter 9) develops a comparative framework, and assesses the extent to which there is a relationship between the management of learning and innovation within the two organizations detailed in this section. The intention is to show that where organizational learning is managed systematically and proactively, there is a higher probability that sustained innovation will be produced than where the converse is the case.

#### Methodological approach

The research presented in earlier chapters is based upon quantitative techniques exploring relationships between dependent and independent variables. Statistical tools such as regression analysis were used to address questions concerned with the effect of dependent variables (for example, human resource planning) upon outcomes, such as, say, innovation in technical systems. Such an approach has many strengths. Quantitative approaches draw upon data derived from a number of organizations and make it possible for researchers to

present a framework that has general applicability. Regression analysis can also take into account control variables and, where applied longitudinally, can look at developments and changes over time, thereby substantiating cause/ effect associations. By using quantitative approaches, I have been able to make an empirical, as well as theoretical, case in support of the model proposed in chapter 2.

There are, however, some limitations attached to this approach. Although control variables can take into account factors such as size and profitability, quantitative approaches make it difficult to assess the impact of such extraneous variables that have not been part of the original research design (Johnson & Gill, 1997; Miles & Huberman, 1984). For example, factors such as whether or not the organization embraces team-working or quality management may explain its capacity to produce sustained innovation, rather than the variables that are being directly considered.

In order to address this potential limitation, I take a qualitative approach in this and the next chapter and explore issues surrounding learning and innovation within a particular context. A number of researchers argue for this type of triangulation of data gathering. Jick (1979, p.604), for example, proposes that 'any biases inherent in particular data sources, investigators and methods would be neutralized when used in conjunction with other data sources, investigators and methods.'

Qualitative approaches to data-collection, according to Miles and Huberman (1984), require prolonged contact within a particular context, in situations where 'normal' activity is taking place. They rely upon the researcher capturing data through being empathetic with the actors and rarely use measurement devices. A variety of interpretations of the data are possible, although one or two may become more compelling than others through internal

consistency or through links with theory. The approach means that the researcher remains open to unexpected findings and can probe in areas where there is nothing specifically mentioned on the questionnaire schedule. Johnson and Gill (1997, p.37) note that the emphasis is on 'theory grounded in empirical observations taking account of subjects' meaning and interpretational systems in order to gain explanation by understanding.' This was the approach adopted for the research conducted within the two organizations in this study.

### Method

Data for the Raychem study were collected as part of the much larger research exercise referred to in chapter 3. The overall purpose of the exercise was to explore the relationship between people management practices and organizational effectiveness. Interviews were conducted with representatives from management for all the companies in the survey in order to explore perceptions of environmental uncertainty, quality, HRM, structure, job design and training. Detailed analyses were made of a range of outcome measures, such as profitability, productivity and innovation. The innovation survey drew upon the perceptions of technical experts relating to whatever sphere of innovation was most relevant for their area of expertise (as described in chapter 4). Furthermore, the responses of technical experts were considered together with employee perceptions of the climate for innovation/ flexibility, thus substantiating any case made for or against the propensity of some organizations to produce innovation. A significant strength of the study lies in the way it draws upon data from distinct and separate sources.

Raychem UK was selected as a particular focus for this study for a number of reasons. Firstly, as outlined above, it was similar in size and in terms of the types of

products manufactured to the organization considered in previous chapters. It appeared to be a highly innovative organization, on the basis of the scores it received as part of the research exercise detailed above. Furthermore, transcriptions of the interviews conducted within Raychem revealed that Raychem management appeared to be strongly committed to the learning and development of all employees, from operators to more senior personnel. I felt, therefore, that a specific focus on this organization might provide a clearer understanding of the relationship between people management practices, learning and innovation.

A number of interviews were conducted within Raychem UK. The first was with the chief executive of Raychem UK and provides background information about the organization's relationship with the parent company, its structure and the main competitive challenges that it faced. The second interview was carried out with the organization's HR Manager and was designed to elicit information about the organization's approach to the management of people and the role of HR in this. It explored the extent to which the organization engaged in a range of HR practices at operational and strategic level and also considered how the HR function provided support for the line management team. The third in-depth interview was conducted with the production manager for Wire and Cables, which was part of Raychem UK, and which used sophisticated approaches for the managing teams and quality. The interview considered in detail the approach taken towards the management of teams by Wire and Cables in particular and Raychem UK in general. Furthermore, the interview provides insight into the Raychem approach to quality management. It considers in particular the

way in which the organization sought to use quality tools as mechanisms to enhance the learning of operators, team leaders and managers.

Turning to RPL, this company was selected as a particular focus because it was similar in many ways to the other organizations considered in the thesis. It was a manufacturing operation, producing high specification office equipment and was regarded as a major employer in the area. The organization was also open to scrutiny, and, as part of its efforts to gain quality accreditation, was apparently willing to take into account employee perceptions of the learning environment in order to develop strategies for addressing any concerns. Since there was limited data available in the Raychem study on employee perceptions of learning, the RPL study represented an opportunity to gain this type of insight.

Much of the data for the RPL exercise was gathered as described above with reference to Raychem. In-depth interviews were carried out with the Chief Executive Officer to gain contextual information. Interviews with production and technical managers were also conducted for this purpose. I also spoke to HR and training managers. As was the case for the Raychem exercise, the intention was to consider the extent to which HR supported line management and to ascertain whether there was strategic integration between the objectives of the business and its approach to people management.

I also focused upon employee perceptions of the learning environment within RPL, since I had limited access to such data within Raychem. I spoke to five individuals who were regarded as 'high performers' (as assessed by the HR manager). Three of these individuals worked in the technical area of the business and the two other 'high performers'

worked in support operations- one as manager of HR and the other as manager for the environmental aspects of the business. I also gathered data using employee focus groups. Some of these employees worked on the shop-floor, either as production operators or as team-leaders. Others were employed as apprentices, or in areas such as stores or environmental/ waste management. As a basis for discussions, I devised a questionnaire, based on the theoretical section of the thesis and upon the scale portrayed in detail in Chapter 3. The questionnaire asked employees to detail any changes or innovations with which they had been directly involved, and asked them to assess the extent to which learning experiences in the internal or external environment had made it possible for them to contribute to the change or innovation concerned. The questionnaire asked, for example, whether the employee had learnt from internal sources, such as career development plans, or secondments to other parts of the business. It also asked whether he or she had learnt through visiting customers and/ or suppliers, and whether it had been possible to pass on any knowledge acquired in this way through the use of mechanisms designed to facilitate the transfer and storage of best practice ideas. There was also a section on factors constraining or enabling learning.

All the interviews were tape-recorded and transcribed prior to being coded into themes. Because the qualitative research was conducted at a relatively late stage of the thesis, I had in mind a set of variables that I believed to be important to understand what factors impacted upon learning. Following Easterby-Smith, Thorpe and Lowe (1997), I grouped responses and quotations into themes, first to set the context (Chapter 8) and then to establish a comparative framework (Chapter 9). Since it was a comparative study, I needed to show that the two organizations were similar in many respects, therefore I developed

themes giving general background about the organizations and providing information about the approach each organization took towards the management of learning and human resource management. The theme of environmental uncertainty was also explored in this chapter. It was important to have detailed these findings because, in the following chapter, I consider their significance in relation to the major themes which have emerged to date in the thesis. For example, results presented in chapters 4 and 5 suggest that effective people management, at a strategic and operational level, play an important part in generating organizational learning, because it offers a sense of direction for individuals and clarifies what skills are valued and rewarded. I therefore discuss in Chapter 9, with reference to both organizations, the importance of having a structure and sense of direction for learning. Further details of the themes that I have used as a way of explaining the significance of the findings reported in Chapter 8 can be found on the opening page of Chapter 9.

Finally, I attempted to reach an understanding about the extent to which RPL exhibited high or low levels of innovation. The methodology used for this part of the research is as outlined above with reference to Raychem. Innovation was measured by asking technical experts to detail changes or innovations in products, production technology and production processes which had occurred over the last two years, and which were planned for the future. Respondents were asked to rate the innovations on a scale 1- 7, with 1 being 'not at all innovative' and 7 'highly innovative.' They were also asked to rate the innovations according to their magnitude and their impact upon others within the organization.

## Findings

### Organizational background

There were, superficially at least, many similarities between the two companies. Raychem UK was larger, with 1300 employees in comparison with 700 at RPL, but both organizations were foreign-owned and both were engaged in the manufacture of high specification products for demanding consumers. Both organizations were part of large, global operations. Furthermore, the Ricoh Group and Raychem worldwide were seen as market leaders in their fields. Their UK subsidiaries had to compete with sister-companies for scarce resources. RPL and Raychem UK thus had to manage the expectations of the parent company in order to convince them that they were able to deliver high quality and cost-effective end products. Both organizations were required to conform to Head Office requirements in terms of reporting procedures, information systems, budgeting and the communication of organizational values. Furthermore, it was clear that both organizations attached significant value to the people that they employed. RPL provided a number of amenities for staff and was committed to their on-going employment regardless of the market situation: Raychem UK clearly believed in the need to invest in the skills of staff, whilst having a less robust commitment to on-going job security.

### Organizational purpose and structure

The Ricoh Group was founded in 1935. It was, at the time of writing, a world leader in the manufacture office equipment, including photocopiers, faxes, scanners and printers. It had outlets in China, Japan, Taiwan and the States, as well as in Europe (France, Holland, Germany and Italy and the UK). The company had increased its market share over the past

five years, performing, according to one source, at least as well as main competitors, such as Xerox, Cannon and Minolta. According to one source, 'we were considerably ahead of our competitors in placing digital copiers in the European market and we remain to date the no.1 market leader in this field.'

The Telford-based operation (RPL) was the first European subsidiary to be opened, with production commencing in January 1985. It employed approximately 650 employees and had a turnover of between £80 – 85 million p.a. and profits of between £7 - £15 million p.a. Its contribution to global turnover was relatively small, representing, according to one source, around 2% of this figure. It was, however, seen as a strategically important operation, in terms of its proximity to a substantial actual and potential customer base (leveraged through two sales dealership operations). The primary purpose of the organization was to produce photocopiers and in the process of doing so to manufacture some of the key constituent parts of the product. Accordingly, drum and toner- items required in order to ensure the effective functioning of the machine – was produced and input into the final product. Other component parts were manufactured in Ricoh, China and the assembly and quality testing were carried out at Telford.

The Raychem Corporation, based in California and started in 1957, was similarly a worldwide operation. It employed around 10,500 employees globally with a total turnover of around \$1.5 billion. Its technology was novel and involved exposing plastic materials to electron beam radiation. The Corporation developed a global impetus rapidly, establishing outlets in key main European countries within a few years of its existence. It manufactured goods to meet the needs of three main markets: telecommunications, selling systems which allow the sealing and protection of wiring systems for customers such as British Telecom;

electronics, providing cabling for the defense industry and for railway communications and commercial aircraft and industrial, providing power technologies for the offshore oil industry and pipeline coating to prevent corrosion.

Raychem UK Ltd was the first of the manufacturing plants established outside the States, starting to operate in 1980. It employed around 1300 people and had a turnover of £146 million. Its main product groups were: Wire and Cable accounting for 30% of business; Thermofit (a heat-shrinking product) accounting for 60% of sales and raw materials (10%). Despite unfavourable trading conditions and the contraction of the defense industry, the operations steadily increased turnover without a proportional increase in the number of people employed. According to the company's Chief Executive, success of the business was attributable to three factors: firstly, high investment in Research and Development (between 6 and 10% of sales were on average invested into the business), secondly, a determination to reduce costs, especially in manufacturing and, thirdly, an ability to attract and retain key personnel.

Raychem UK Ltd. had strong links with its parent company with regard to management information systems, accounting procedures and broad values, especially to do with human resource management and development. It was, however, unlike RPL, encouraged to take responsibility for new product development and for anticipating the needs of the UK and European market in particular. It was thus strongly encouraged to develop its own identity separately from the parent company.

RPL was also structured into three businesses. The largest area was Plain Paper Copying (PPC), where photocopiers were assembled, tested and shipped out to distributors. This area employed around 200 people. Work was organized in two main ways: around

half of the operators were employed on a straightforward assembly line, whilst the other half worked in cells carrying out specific aspects of the assembly operation. Toner production employed approximately 80 members of staff, whilst Organic Photo Conductors (OPC), manufacturing photocopier drums, employed around 50 operators. Whilst OPC was the smallest manufacturing outlet, it was, according to one source, generating the highest revenue per capita, with profits of around £1.5 million p.a. (the profit for the whole of RPL was £8 million).

There were six levels between the bottom and the top of the organization: operator, senior operator, team leader, assistant manager, general manager and chief executive. Team leaders were able to make decisions to do with the promotion or the selection of an operator, while assistant managers decided upon the allocation of work and overtime priorities. General Managers would consider the feasibility of creating a new position. In terms of progression through the levels, one source stated that 'training for semi-skilled jobs (senior operator or team leader) is quite quick: we are looking for motivation and commitment.' The company endeavoured to capture the views of the workforce about their perceptions of opportunities for consultation, participation and learning. A recent employee attitude survey highlighted employee concerns in some of these areas. Pay and conditions were decided unilaterally (there was no union representation at the business).

Raychem similarly was structured in a traditional format, with five levels between operator and Chief Executive. It was perhaps unusual in the importance that it attached to dual reporting. All senior managers had responsibilities for function, product or geographic area, organized on a matrix basis. For day-to-day operations, a management team comprised of twelve individuals met each month. Changes in structure involved

efforts to push operational decision-making down to teams at shop-floor level. This was an important theme that will be raised in more detail in the following sections.

The main formal vehicle for top-down communication was an annual meeting between senior operating manager and workforce and regular visits by the president of the Corporation to raise issues with management personnel to do with strategic direction. Divisional and other company newsletters were produced on a quarterly basis. A new development was the use of attitude surveys to test the perceptions of staff about a range of employment-related issues. Despite the strong drive to enhance learning and empowerment, discussed below, the employee attitude survey alluded to perceptions of the poor quality of provision provided for bottom-up communication. However, the extent to which this was acknowledged as an issue by Raychem management was questionable. The company did not recognize a trade union and did not have an employee representative group. As far as pay negotiations were concerned, there was a strong view that there would not be an arena for discussion, but that management would come to decisions unilaterally.

#### Environmental uncertainty

Raychem prospered on the basis of its technological lead over other businesses, and there was a strong perception that the company was better than the competition, and had been so over the past five years. Whilst there was competition– 3M or BICC were the companies mentioned most frequently– most senior members of the organization took the view that Raychem's product was inherently superior and would continue to be so.

However, some influential players within the business held that this competitive advantage had led to a certain feeling of invulnerability or even arrogance. Despite the

clear technological advantages enjoyed by Raychem, it was operating in a highly volatile market. This situation was likely to become more pronounced as a result of the cuts in the defense industry. This (defense) had traditionally been one area of the business where demand was predictable, allowing production planning well in advance. Without this business, the company was forced to rely on the private sector, and to take a variety of much smaller orders in order to maintain production capacity. The result was that the UK business as a whole produced around 7000 different products, 60% of which were 'one-offs'. The average batch size within Wires and Cables, for example, was cabling of 250 metres - as the Production Manager commented, very few other companies were able or willing to take work of this order of magnitude. Every order was made to specification: in addition, some 20% of work required major changes in production technology.

There was clearly a large and growing requirement for the Raychem workforce to be flexible and multi-skilled. This resulted in increasing interest within the company in raising skill levels and developing a situation whereby employees took responsibility for meeting customer demands. The company's approach to this challenge is summarized in the following sections.

Turning to RPL, according to a number of sources, the photocopying industry was highly competitive, with about five key organizations dominating the sector and aiming to 'manipulate the market place the make the customers go in a certain direction.' One example of this trend was the development of so-called 'pre-configured' machines, providing customers with the exact (custom-made) combination of facilities to copy, scan, fax, email and print material that customers require. Thus the Ricoh Group saw its

priority as being ‘to produce leading products and to provide total customer satisfaction.’

Sustained innovation – in both products and services- was required to maintain market share.

RPL was somewhat protected from these pressures, however. The Ricoh subsidiary companies were not involved in selling to the end-users of the product or in providing support or training services to them. RPL supplied product to a UK-based distribution company, which in turn provided sales dealers with the required items to pass on to the final customer- a for-profit business, a hospital or a school. There is a widespread view that where there is no direct contact between the organization and the final user of the product, there is a potential difficulty in developing the impetus to effect innovation and change. It is therefore not unreasonable to suppose that the lack of such exposure may inhibit learning. In an attempt to address this problem, RPL management emphasized to employees the importance of regarding the sales companies as customers, stating that any innovations which facilitated the process of transferring stock between manufacturer and sales company would be of direct benefit for the end-user and thus likely to consolidate RPL’s position. It was noted that ‘high quality includes on-time delivery’, and that the ‘sales company can say (to the parent company) when they feel that quality and delivery is not standard.’ It was not clear, however, how much influence the sales companies had upon the everyday activities and thinking of employees, even those who are in a position to enact innovation. In practice, it would perhaps not be in interests of the sales companies to undermine RPL in the eyes of the parent company, since doing so may have serious consequences for their own business.

RPL’s main internal competitor within the Ricoh Group was Ricoh Industrie. One source noted that ‘we weren’t chosen to produce digital toner- that went to our sister

company in France.' Ricoh China were also potentially a major internal competitor: however, the latest global production strategy proposed that European and Asian factories concentrate their efforts on different stages in the same supply chain. One effect of this strategy was to develop the manufacture of the lower specification photocopier parts in the Far East, whilst the assembly and final testing of the product took place in Telford. Similarly, drum and toner manufacture, was subject to competition from independent suppliers who could supply Ricoh compatible products. Again, in practice, it is difficult to see to what extent external suppliers represented a significant threat to these operations, since drum and toner were produced in order to allow RPL to manufacture the completed photocopier (i.e. there was a clear internal market).

#### Approach to HRM and learning

Raychem UK saw itself single status, with considerable investment in benefits, such as pensions and private health insurance available to shop floor as well as administrative and managerial staff. Despite a rash of redundancies, the company 'sought redeployment rather than redundancy whenever possible', Pay, in the opinion of the HR Manager, was about average compared to the competition for shop-floor workers and above average for management. The company was not committed to collective bargaining and did not provide any mechanism for the discussion of wage claims. To date there had been no major disputes or strikes.

The HR function within Raychem appeared to be held in high esteem. One manager commented, for example, on the way the function arranged for every manager to hold regular briefing sessions with staff. On a quarterly basis, managers would bring together around twelve employees, listen to their views about work and any issues of

concern and generally allowing people to 'blow their fuses'. These sessions in the view of the manager concerned 'worked extremely well and the HR manager sat in on every one...all eighteen of them, which goes to show to commitment shown by the function to production'.

The HR Director was represented on the UK Board: there were thirteen people employed altogether in HR and seven of these people had personnel-related qualifications. There was a formal HR strategy endorsed by the senior management team, but the function operated a 'hands off' approach in its relations with line managers, the HR Manager taking the view that managers saw training, conducting disciplinary interviews and carrying out selection as part of their jobs: 'they take more responsibility for personnel matters than a lot of companies I have come across.' The key function of HR was to provide the back-up and support in terms, for example, of dealing with the logistics of selection and advising about appropriate methods. The function also had a commitment to improving the capacity of managers to manage effectively, so the whole business of training and development, have managerial and shop-floor people, was taken seriously. For example the shop floor would be expected to undertake skills-based and teamwork training. Whilst much of this was organized within Divisions, the HR function took an overview of training needs, taking into account business plans.

The assessment process when seeking to fill posts was oriented towards looking for skills – such as team working which were seen as necessary to enable the organization's progression and advancement. (Group-based interviews, for example, were used when selecting employees for work in the shop floor). This was followed by an induction procedure involving all recruits, comprising four days in total. One of the

key purposes of these sessions was to orient new recruits into the culture and values of the company. Training of shop-floor workers was directed towards developing skills and also improving peoples' capacity to work in teams. Managers and professional staff were encouraged to undertake development that would allow them to improve on their people management skills. A course in developing coaching skills, for example, had recently been set up: 'All managers should be coaching the people...the principle of coaching as being part of your job, that is accepted...anybody who has responsibility for managing or supervising other people.' Anyone with responsibility for people was expected to undertake training in appraisal skills, and to receive regular updates on this. The HR function had recently developed a set of management guidelines, which were intended to develop a consistent approach across divisions to a whole range of people management issues.

Although HR staff were well informed about most of the formal learning interventions established within the organization, they did not take responsibility for managing these practices. Line managers made the decisions about what training opportunities were appropriate for which members of staff. Most of the formal training carried out was qualification-based, with BTEC's popular options for clerical and administrative staff as well as MS's and Diplomas. Management were encouraged to take MSc courses at Warwick University, programmes which had been designed taking into account the specific requirements of the organization. The company had considered using a National Vocational Qualification scheme, but found the process too unwieldy and bureaucratically driven. Informally, the company favoured the use of secondments, particularly for managers; it operated a mentoring scheme for graduate employees, and it

supported the process of employees visiting suppliers and customers in order to gain further insights into the production process and their role within this. People were encouraged to undertake educationally based training even in situations where it was not directly related to their jobs, on the basis that 'a trained and educated workforce is likely to be more willing and able to respond positively to change'. The organization thus scored positively for nine of the fourteen questions referred to in chapter 3 as 'learning mechanisms.'

Evidence suggested that much of the learning taking place within Raychem was attributable to the importance attached to team working. As indicated above, this was an area in which Raychem invested heavily. All three plants used quality improvement teams and significant efforts had been made to organize work across the three divisions so that teams, rather than individuals, had responsibility. Within Wire and Cables this process was particularly well established; teamwork was seen to be 'absolutely, totally, the only way forward'. Here, business units had been created, comprised of fifty to sixty people, which were encouraged to take ownership of the final product. These were divided into sub-teams of five or six people. Success was monitored by measuring both output and scrap levels, as well as customer complaints, as detailed above.

One result of this was that Wire and Cabling found itself able to run smaller batches without increasing levels of scrap. In addition, a loss of 18% or forty members of the workforce as a result of redundancy led only to a drop in production of 3% and productivity improvements continued to be pronounced: 'productivity has gone up, all the way through this, even when I have been doing all of these changes, I haven't gone out and asked for money...'

This was achieved by being fairly ruthless about who should be involved in the new team structure. Those who were in junior leadership positions but were not perceived to have the necessary people management skills or approach to change were encouraged to take voluntary redundancy or early retirement: 'we used to have shift leaders, we took them on an away day...it wasn't a course, it was an awareness session, and at the end of it they all said, so what we have been doing the last fifteen years is a waste of time and I said yes, you are adding no value to the organization.' People went through a selection procedure to determine what their new roles would be, a procedure that took into account the views of operators: '...we asked all the operators what they would expect from working team leaders. We didn't ask them who they wanted, we asked what they would expect and then came the basis, if you like, of the interview.' People who were perceived to be 'not team players' were encouraged to apply for voluntary redundancy, so that the organization was left with a hard core of committed team members.

As the team operation gathered momentum, it continued to be challenging: 'you are changing the culture of everybody who has worked a certain way for the last twenty, thirty years, it's a real, real problem. Some of the operators don't like the way I work because it's very informal, they say we expect managers to be bastards, to shout at us, you don't, you confuse the hell out of us. They like boundaries.... they say, we don't like this, we can't blame you any more...' The production manager referred to the need to temper autonomy with a sense of direction: 'you have to set some performance measures...you have to try to dictate what they are doing but not let them realize what's going on, if you allow total empowerment, these guys will just focus on their own thing.'

Several examples were provided of the way in which improvements in effectiveness resulted from a more focused team effort. One team decided of its own volition to run short batches – requiring frequent set-up changes- during the day shift when there were more people available to assist with this process. The night- shift was set aside for the longer runs, since there were fewer personnel available to carry out the necessary set-up changes. Another decided to video its members in action on the production line, and then to scrutinize the video in order to look for ways of improving the process. This provided evidence to suggest that teams were beginning to work effectively not just within shifts, but also across a 24-hour cycle. The next phase in their development, according to the production manager, would be to increase their contact with suppliers and customers, and this was beginning to be addressed in some of the ways outlined in the above section considering quality issues.

These positive results were not achieved without a cost. The commitment to training was on-going: ‘when you say how long does it take to train somebody, I would say forever, I have said minimum six months, but we don’t stop training...it is a continual renewal process.... it is a long, long haul.’ On average, each team member received around five weeks off-job training in team-building skills, together with an additional two-day refresher course at regular intervals. A substantial proportion of the teams were not felt to be fully functioning even after this effort had been expended, with around seven from a total of twenty-two teams within Wire and Cables continuing to require substantial support from management in areas such as scheduling over a twenty-four hour period – supposedly the key task of the team. One of the difficulties inherent in setting up self-managing teams was frequently the attitude of management. There was a recognized need

to train everyone in the concept of team working, not just operators: 'everyone in manufacturing has gone through this training.'

Despite these difficulties, the company remained committed to the concept of team working, seeing this as 'the only way forward'. The opportunities for empowerment within teams played an important role in the development of individuals. This happened as developmental opportunities were presented in the workplace and, to a more limited extent, externally. At work, shop-floor operators were said to have a great deal of variety in their jobs and to get very involved in dealing with significant supply problems.

Together with other team members, they took responsibility for setting up machine for changeover and for new products. They could also decide when to take breaks: 'they can take them when they want.' They were responsible for establishing the order in which to tackle jobs within a 24-hour schedule.

The company also used quality accreditation as a way of generating commitment for both acquiring knowledge and sharing best practice. One of the managers from Wire and Cables, for example, commented that in his view, distancing quality from day-to-day operations was not helpful: 'I think it is crazy, people sit there for an hour and talk quality, and go back to the good old ways'. He preferred instead to use quarterly briefing during which operators would volunteer to present their perceptions of quality to the division as a whole. This, in his view, had the advantages both of leading to discussion of issues of perceived relevance, whilst at the same time providing recognition to the team and operator concerned. The same manager held that it was necessary to change people before attempting to change processes and systems: 'I think that you have to go through radical change first...' This suggests that, in his view, people cannot take on additional

responsibilities for quality audit unless they have to have the skills and knowledge to allow them to do so effectively. In order to promote learning in this area, operators were required to play an active role in monitoring customer complaints. They would, for example, be asked to make presentations to management together with the wider team detailing the nature of the complaints and action taken to deal with the issue: 'some of the operators who get out there they say I have never done a presentation in my life, and it is good.... it is a combination, the whole team, people from production control, engineers, people from marketing...they come out with some really good issues...'

A second point to emerge was to do with the perceived value of many of the quality audits undertaken: 'they (the customers) expect you to test the hell out of a product, but slowly we are moving out of that into why do you really need to do it and who should do it.' As a result of this approach, customers were encouraged to develop close relationships with Wire and Cable, so that they would not feel it necessary to conduct in-house testing: 'it is a partnership, basically, where they have come to understand what we do, are happy with it and we are trying to go down that route because it saves money and it is a competitive advantage.'

Turning to RPL, the approach adopted to people management was, according to Purcell and Sisson's (1983) typology, paternalistic rather than progressive. For example, in 2001, following a down-turn in production, over one hundred production operators could no longer be employed in their production roles: they were instead offered secondments to other parts of the business. HR staff offered counseling support to staff and oversaw the operation of a generous voluntary redundancy scheme. On the other hand, there was no

Board level representation of the HR function and no obvious strategic plan for people management issues.

How did RPL manage the learning of its employees? In many ways, individuals were encouraged to contribute to teams. Respondents referred the open and friendly dialogue that existed: 'this is a very approachable organization. I will talk to production managers, engineering managers. There is no formal route, but you can learn quite a lot through bouncing ideas off one another.' Another stated that 'we have a lot of interaction with other engineers; we're all really open, we look at an idea, take it to pieces, try to look at different ways of doing it. We try it out, see if it works, share it with the wider group.' Discussing the transfer of knowledge, another respondent commented that 'best practices are transferred through regular managers' and general managers' meetings. . the departmental manager can request further support from other sections.' A number of individuals made reference to the positive climate for discussing new ideas, stating that few negative penalties were attached to enacting new ideas that did not work out. One respondent from Toner noted that 'we can come up with some bizarre ideas- some will work, others won't. Whether it's the relaxed culture...we can try anything.' Another Assistant Manager commented that 'my ideas have always been welcomed and encouraged ...and I come from a production line.' Some expressed the view that the organization was 'soft' and unwilling to tackle performance problems. One source stated that in his view, having a culture that is supportive of new ideas 'is a bit detrimental: we ought to tackle some of the issues, not from a disciplinary point of view, but from a learning point of view.' Others expressed the view that there was insufficient transfer of knowledge between the different production operations, for example, between PPC and Toner: 'I'd like to take some

of the good things we do into another area...we don't tend to do that...departments tend to be quite isolated.'

There was little evidence of any structured attempts to develop team-working and communication skills. The performance review process was generally seen as a device for enabling managers to assert control over the achievement of specified targets. Senior management and other respondents spoke of the absence of a system for considering employees' long-term career development needs, and there did not appear to be any recognition of mentoring roles. Although a number of respondents made reference to a 'World Class Team Leader' scheme, intended to develop team and leadership skills, few people appeared to have attended the programme in recent years. Neither did I find any evidence to suggest that the organization used quality accreditation processes to drive organizational change, in the way described at Raychem. Clearly, quality was, in the words of the CEO, 'very much embedded in thinking.' Significant emphasis was attached to 'Kaizen', to training the workforce to endorse basic quality measures to improve the production process. Evidence from focus groups suggested that operators were trained to endorse clear quality guidelines, with little provision made for questioning their impact.

There were, however, some striking illustrations of individual development. A number of respondents mentioned the long-standing apprentice scheme; it had provided them with the technical knowledge to see the relevance of new ideas and to understand how they could be applied. One respondent noted that the craft apprenticeship he acquired at RPL gave him the confidence and skills to undertake more advanced technical study, leading to completion of a degree in mechanical engineering and a desire to undertake Masters study. Because of his technical knowledge, this person was able responsibility for

implementing a major innovation within Toner, which added substantially to the worldwide reputation of RPL. Apprentices were seen as special and distinctive in comparison with other shop-floor workers; referring to the company's initiative to develop the I.T skills of all employees, one respondent commented that: 'the computer courses.... when it comes to managing our time, it goes out the window... you being an apprentice, they manage you better.' Although the apprentice scheme was generally highly regarded, there were difficulties with it. One respondent noted that it was difficult to provide apprentices with the mentoring support that they required, stating that 'I've never been trained on how to communicate that type of information.' Another respondent stated that there was little follow-up to the apprentice programme: 'once you come to the end of it, you tend to fall off the edge. It's very much down to the individual to do their own personal development.'

The 'world class team leader' scheme was mentioned by an assistant manager (promoted from the shop-floor) as important in shaping his contribution and ability to implement improvements: 'the team leader experiences and development have prepared me for this.' This was cited by others who had been rapidly promoted as an important vehicle for providing insight into managerial activities. Furthermore, nearly all the identified high performers involved in production or engineering had been strongly influenced by the Japanese advisors who visited from Head Office. They were seen as both coaches, providing guidance on specific aspects of technical tasks, and also, on occasions, as mentors, providing longer-term career guidance. One respondent stated simply that 'I have gained all my knowledge from the Japanese advisors.' When asked what sort of skills the Japanese brought to facilitate learning, people responded differently. One respondent stated that 'the Japanese communication is better: they always ask for data, we tend to operate on

the basis of gut feelings.’ Another argued that the Japanese have more regimented reporting and procedural systems, adding that in his view ‘combining the British and the Japanese (approaches) can be very powerful learning.... they are more cautious and methodical, we are more quick, more willing to try new things.’ The support worked well in certain circumstances: ‘how this works is reliant on the personality of the Japanese advisor, it depends on the relationship you have with this person, on the extent to which you are proactive in asking him about particular aspects of the job.’ On the negative side, there was an acknowledgment of the language difficulty, which was on occasions insurmountable, and also of the very different styles of the advisors, with some much more willing to offer help and support than others.

Some respondents mentioned the contribution of UK managers to the development of their subordinates. One individual provided a vivid analogy of the developmental process: as he took on a new project ‘it was like letting out a piece of rope...as I could take on more of the rope, he would let out more.... at first, he was the leader, but as the project went on I was there at the front of meetings. at quite a young age presenting where we were up to with a £1.2 million budget to spend.’ The same respondent stated, ‘if you have someone who is a control freak, who is not willing to leave you to it, that will stifle progression and stifle innovation because nobody will feel that they can do it by themselves.’ One respondent discussed her commitment to supporting the learning of her subordinates, stating that ‘I can encourage my team to develop new skills.... I want my team to learn as much as possible from me.’

Several of the identified ‘high performers’ referred to the learning generated through being involved with the innovation itself, particularly where the idea behind the innovation

had arisen from the UK, rather than Japan. A senior engineer commented that because his role involved carrying out special projects, he was able to gain experience in areas outside the engineering role. One manager involved with developing configuration technology stated that 'I don't think there was anything which prepared me for it- basically, on the job, as it was happening, I gained the experience.' This particular project expanded the respondent's thinking about the range of products made by RPL, and provided opportunities for liaison with customers and with other parts of the business: 'this gave me the full picture of what we are doing here. I saw the end of what we are producing, instead of a small starting point. It allowed me to get more involved with the business planning and senior management issues- in engineering, we are very isolated, we tend not to get involved in those sorts of issues...it was a real developmental experience.' Another respondent from Toner noted that as a result of his involvement in the development of new bottling machines for the product, he gained 'exposure to something that was totally new to me. I used the background experiences I had in engineering and used the innovation itself as a learning experience.'

Respondents varied in the extent to which they were exposed to the external environment. A number stated that they had no relationship with key stakeholders outside the organization, for example, 'I would love to have more contact with customers; this doesn't happen at all.' Others, particularly those with responsibility for special projects, had considerable experiences like this, for example: 'I've had the opportunity to visit Ricoh overseas sites. We sell to distributors- I also visit 'end-of-line' customers- the final user.' On the whole, respondents cited the importance of liaison with other parts of the Ricoh Group, rather than with the wider environment. Several stated that they had visited Japan

on a number of occasions, sometimes for technical advice, sometimes to attend conferences around quality-related themes such as 'Kaizen'. In addition, RPL was involved with Department of Trade and Industry benchmarking initiatives. These were designed to provide individuals with the opportunity to visit other companies and to gain knowledge from them about relevant initiatives, such as cellular manufacturing or environmental management issues. One individual with responsibility for environmental and safety issues, who had introduced a successful innovation around the theme of 'zero waste' commented that 'this is very relevant for us. We visit local companies- people have visited us and come back to tell us about their health and safety practices- I set that up locally. DTI meeting provide me with lots of contacts.' However, it appeared that only a small proportion of the workforce had the opportunity or the motivation to develop links with the external environment in this way. For example, only about ten visits per year across all categories of staff were recorded. A number of respondents took the view that 'we should get out a lot more.' Echoing the concerns expressed earlier to do with the lack of fluidity within the management team, the same respondent commented that 'probably half the people who work here and most of the management team, all their experience has been with Ricoh...we should be pushing the D.T.I. scheme more.'

'Midlands Excellence' were responsible for promulgating ways of achieving effective business performance; a group of assessors visit organizations that apply for validation and consider the extent to which business practices conform with the model. RPL's involvement was considered to be valuable: 'Business Excellence has forced us to look very critically at what we are doing...this is a very big initiative, a major vehicle for change.' One respondent stated that: 'I don't think we communicate it very well... we are

learning. Another stated that a number of innovations had arisen directly from involvement with this scheme, including the introduction of an employee satisfaction survey and a re-launched employee suggestion scheme.

There was, however, little evidence of any planned development for managers, although, as previously mentioned, a high proportion of management staff had been promoted through the ranks from shop-floor level. Some of the senior management team seemed to take the view that they had progressed beyond the need for further development; one interviewee, for example, when asked whether he had the opportunity to discuss long-term career plans, reacted quite defensively: 'do you mean me? You must be joking- I report to the MD.' A number of respondents referred to the lack of change within management ranks, in terms of turnover and also in terms of new ideas: the following comment brought together the views of a number of those interviewed:

'I think the company is too stagnant, too complacent, there needs to be more movement. We have a very low turnover, especially in indirect areas- you could argue that this is where the thinkers should be. Managers never leave, you get no thinkers, no innovation...the managers are a very close-knit group.'

To what extent were employees encouraged to gain formal qualifications? A number of respondents made reference to the importance of a strong technical background when developing new production technology and processes. However, only one of the identified 'high performers' in technical areas was educated to degree level. Within Business Support, the two respondents interviewed had gained professional qualifications outside RPL, one to Masters' level. The HR Assistant Manager cited the importance of CIPD qualifications in shaping her approach to work. She felt that her impact was limited,

however: 'there doesn't seem to be the interest from the top.' Another Assistant Manager took the view that there was little acknowledgment of the value of formal qualifications within RPL. That RPL does not value formal qualifications was substantiated to some extent by the Training Manager: 'we've got a lot of people who've reached academic career development- to use it is something completely different. They've got there by being able to use specific bits of information to convince examiners what they have to offer.' In other words, people with formal qualifications were frequently not perceived to use their knowledge to add value to the organization, perhaps because the standards that they had reached were insufficiently exacting.

In summary, there were many examples of powerful learning happening at an individual level, for those who were particularly motivated and well informed about what opportunities existed and how they could present a case for exploiting them for their own learning and progression. There was, however, little evidence to suggest that the organization was systematically capturing the knowledge of individuals and thus developing new and improved ways of working. A number of possible explanations for the limited organizational learning exhibited are raised in the next chapter.

### Innovation

It was fairly clear upon investigation that there was a fairly limited commitment at senior level to the concept of innovation at RPL, and this was borne out through discussion with technical experts. When asked to outline details of innovations enacted to date, most technical experts took the view that any innovations produced were relatively small-scale, involving only a small proportion of staff. Thus, overall scores for innovation in products, processes, technology, work administration and HRM were fairly

low. This finding was partly attributable to the fact that virtually all product innovation was instigated by the parent company in Japan. Production technology was sophisticated to enable the manufacture of complex electronic parts and was obviously updated as new products were introduced. However, data suggest that RPL was not particularly innovative in terms its approach to work systems. This was particularly the case for the largest of the operations, PPC. The innovation score would therefore be higher for innovation in production technology- perhaps 3- and lower for product innovation (2) and innovation in administrative systems and HRM (2). It is probably reasonable to allocate a score of 2 on a scale 1-7 for overall innovation.

On the other hand, Raychem UK was classified as highly innovative in many of these areas. On a scale 1- 7, Raychem scored 6.5 for product innovation, 5 for innovation in production technology, 5 for innovation in production processes, 5.5 for innovation in work organization, 3.5 for innovation in HRM and 5 for innovation in administrative systems. The overall score for innovation in technical systems was 5.5.

### Conclusion

This chapter has presented a comparative framework for Raychem and RPL. Using qualitative methodologies, it has been possible to explore in some depth those aspects of organizational functioning that may explain whether the organization as a whole is able to capture and apply the learning of individuals to generate innovation. The next chapter considers in some detail what implications this comparative study presents for the thesis and for theory and practice concerned with organizational learning.

## CHAPTER 9

### Ricoh and Raychem: discussion and learning

#### Introduction

Findings presented in the last chapter revealed a dichotomy of practice within Raychem and Ricoh (RPL). There was evidence that learning was managed differently and teams were accorded a higher priority within Raychem as opposed to RPL. It is possible that this divergence of practice may go some way towards explaining why Raychem appeared to exhibit higher levels of innovation than RPL, despite the two organizations being similar in terms of their size, product bases and ownership.

Details of the analytical methods are outlined in the methods section of chapter 8. In brief, I coded the data in two ways. Firstly, I established a descriptive framework, intended to show that the two organizations were broadly comparable, but drawing attention to distinctive features that they exhibited. Thus, in Chapter 8, I outlined findings to do with organizational background and structure, environmental uncertainty and approaches to learning/ the management of human resources. Secondly, drawing upon the findings presented in chapter 8, I used the data to address the main themes raised in the thesis so far. For example, results presented in chapters 4 and 5 suggest that effective people management, at a strategic and operational level, plays an important role in generating organizational learning, because it offers a sense of direction to individuals and because it clarifies what skills are valued and rewarded. I therefore discuss in this chapter, with reference to Raychem and RPL, the importance of having a structure and sense of direction for learning. Secondly, evidence outlined in chapter 6 indicates that where individuals have opportunities to experience variety at work, organizations tend to

produce higher levels of product and technological innovation than where the converse is true. It makes sense to suggest that this is particularly the case for managers, who are the role models and sources of support for other employees. I thus consider the extent to which this theme is relevant in seeking to understand why Raychem exhibited higher levels of innovation than RPL, with a specific focus upon opportunities presented to managers for this type of learning.

Findings detailed in chapter 3 suggest that organizations exhibit a 'learning orientation' where they take a pro-active approach towards the management of quality. As a third theme, therefore, I consider this possibility with reference to Raychem and RPL. Fourthly, I take into account the extent to which the organizations in the study were concerned with enhancing the performance of teams. There are two reasons for this focus. Findings presented in chapter 7 revealed that the creative potential of individuals might be amplified in a group setting, given that group affective tone is positive. Furthermore, discussions with employees at RPL suggested that there were significant limitations inherent in the way in which teams were managed within this organization, and it seemed likely that this may have been an inhibiting factor for both individual and organizational learning.

Finally, chapter 3 presents qualified support for the idea that organizations will be more inclined to take a pro-active approach towards the management of people and learning where they perceive that the external environment is turbulent. The argument is that where this is the case, senior figures within the organization are more inclined to invest the resources necessary to foster learning and the building of organizational capability than would be the case otherwise. Because close scrutiny revealed that the two

organizations in the study operated within different contexts, this chapter therefore briefly highlights the notion of environmental uncertainty and its implications for the management of learning and innovation. These themes are depicted in the table detailed below.

|   | Ricoh   | Raychem   |
|---|---|---|
| <u>Descriptive themes</u>   |   |   |
| Background and structure  | Japanese-owned. Engaged in the manufacture of photocopiers and associated products. 700 employees.  | US- owned. Manufacture of electronic products. 1200 employees.  |
| Environmental uncertainty   | Closely linked to Japanese parent company. New product development initiated from Japan. Steady global demand for products managed through Japan. | Linked to US parent company. Encouraged to take responsibility for anticipating demand in Europe. Withdrawal of defense contracts presented need for flexibility. |
| Approach to the management of human resources                       | Hierarchical. Little evidence of strategic approach to HRM. Limited planned development of employees. On-job coaching by Japanese specialists.    | Single status. Pro-active HR function. Wide variety of approaches to management and employee development  |
| <u>Main themes within thesis</u>                                    |   |   |
| Sense of direction for learning                                     | Weak performance review system. Few opportunities for job rotation. Little evidence of efforts to manage learning proactively.                    | Effective development of managers. Staff expected to engage in job rotation and encouraged to take responsibility for learning.                                   |
| Experience of internal variety                                      | Relatively small proportion of employees experienced internal variety.  | Recognition of the importance of exposing everyone, from operators to senior managers, to new and different experience.   |
| Pro-active management of quality                                    | Interest in promoting 'Kaizen', representing concern with fairly low- level quality initiatives.  | Used quality systems to enhance learning and to promote closer links with customers.  |
| Concern with team performance                                       | Efforts to introduce team-working some years previously had not been sustained.   | Total commitment to effective team-working and substantial investment in team functioning.  |
| Impact of environmental uncertainty upon the management of learning | Little exposure to end user of product. Thus limited appreciation of the need to enhance flexibility and change orientation.                      | Direct exposure to customers. Sense of need to respond to environmental pressures led to engagement in strategic HRM.   |

### Structure and direction for learning

To achieve the level of innovation detailed at the end of chapter 8 by Raychem UK is challenging. It suggests that the organization has developed fairly sophisticated practices to facilitate learning. Literature proposes that organizational learning can be accelerated where individuals are encouraged to generate creative ideas and also where the organization has in place systems and procedures to ensure that ideas are discussed, deliberated upon, disseminated and enacted (Crossnan, Lane & White, 1999). It is also important that organizational values and norms communicate clear endorsement of the importance of learning, creativity and innovation (Leonard-Barton, 1998). Literature further suggests that individuals are creative where there is a clear structure and sense of direction, together with frequent communication and freedom (cf. Brown and Eisenhardt 1998). It follows from this point that in order to make full use of opportunities presented for empowerment, or freedom, employees will have to exhibit high skill levels

There is evidence that management at Raychem recognized the need to provide a sense of direction for staff, whilst at the same time fostering independence. This was particularly the case as the organization sought to encourage work teams to operate autonomously. The production manager of Wire and Cables, for example, took the view that 'you have to dictate what they are doing, but not let them realize (it).' In other words, it was important to give people responsibility but to provide a structure to enable them to make sense of change. There was also an understanding within Raychem UK that where people generated solutions to problems themselves, they were less likely to be defensive about any identified areas for improvement. For example, the production manager referred to the way in which effective teams on the shop-floor had started to use

video equipment in order to consider ways in which practice could be improved, noting that to do so himself would have secured adverse reactions. Furthermore, it was fairly clear that all staff from operators to higher management were expected to play an active role in enhancing their skills. Operators were expected to be multi-skilled and were moved around the factory to gain experience in different parts of the production process (although there was little evidence of operators studying for formal qualifications such as NVQ's). In addition, operators worked regularly with specialists from other parts of the company, especially where they were considering how to improve quality or how to develop a better understanding of customer requirements. Perhaps most importantly, individuals were expected to participate wholeheartedly in training exercises designed to enhance their team-working skills. There was a strong credence attached to the importance of effective team working, rooted in the belief that teams with high skills levels would respond rapidly and positively to requirements for change. The support for individuals to acquire team-working skills was therefore unequivocal and supported by substantial investment.

RPL, however, did not exhibit much, if any, commitment to this type of empowerment. Operators were not encouraged to undertake formal qualifications such as NVQ's, although nominally this was organizational policy. Perhaps more importantly, individuals were not expected to undertake on-the-job learning activity either. For example, there appeared to be few opportunities for operators to undertake job rotation, despite evidence that those who progressed to team-leader level had fortuitously experienced a variety of roles, perhaps as a result of covering for absence or staff holidays. There was little attempt by management to intervene in this ad-hoc process, an

approach rationalized by reference to the operators' own lack of motivation. For example, a senior manager stated that 'they (the operators) prefer to sit with their friends.' In summary, the rather passive approach to the management of learning and creativity exhibited at RPL was perhaps unlikely to communicate a clear message about the extent to which innovative activity was valued and rewarded on the shop floor and elsewhere.

#### Exposure to a variety of perspectives

Theory suggests that knowledge is created as people are exposed to a variety of experience and perspectives both within and outside the organization (Tsai, 2001, Cohen & Levinthal, 1991, Daft & Weick, 1984). Research further proposes there are two ways in which knowledge can be created in organizations; firstly, internally, as employees undertake secondments, job rotation etc. and secondly, externally, as they acquire formal qualifications and establish linkages with customers, other organizations, and professional bodies.

Discussion with high performers at RPL revealed that many of these individuals had acquired significant learning through the pursuit of professional qualifications and through following through opportunities presented by the organization. Evidence is provided of how experiences resulting in the generation of internal variety facilitated learning. Involvement in projects and/ or secondments, taking individuals away from the immediate demands of their day-to-day jobs, were cited by a number of respondents as important; indeed all the identified 'high performers' had had the opportunity to operate in this way. A number of individuals alluded to the learning generated through being involved with external stakeholders, with the D.T.I initiative supporting benchmarking of best practice being

referred to on a number of occasions. The Midlands Excellence scheme was also seen as a powerful instrument for exploratory learning. In addition, individuals who had had the opportunity to develop links with other Ricoh establishments frequently cited the ways in which such relationships provided them with new ideas about improvements that could be enacted within RPL.

Furthermore, RPL had a number of advantages over other businesses engaged in similar operations. The Japanese advisors played an important role in embedding the knowledge of the parent company into RPL activities, and advisors worked alongside permanent members of staff and assisted them in their day-to-day tasks. Some of the advisors went further and offered opportunities for staff to reflect upon their managerial style and career progression. In addition, a number of respondents suggested that the general culture of the organization tended to support and encourage individuals to enact new ideas, without attaching negative penalties where such ideas failed to work out as planned.

Despite some individuals citing the importance of powerful learning experiences like these, there was little evidence that such experiences were planned in order to shape development, or that individuals were encouraged to reflect upon their learning and share the knowledge acquired with others. A performance review system existed, but it was not cited by any of the respondents as relevant in developmental terms. One individual commented that 'appraisals are more short-term; career development isn't discussed.' Another stated that in her view the appraisal was a 'flawed process', with managers giving 'different awards for different levels of work.' There was a general feeling that there was little interest in reflecting upon performance and developing plans for personal development to enable individuals to acquire the experiences necessary to allow them to

be innovative. The difficulty appeared to surround a lack of clarity about how to measure performance: one senior respondent noted that 'there are problems with the assessment system...I don't think we reward effective performance that well.' The process was linked to remuneration, although people did not appear to believe that the link with pay was beneficial in terms of their development. Main criticisms appeared to surround the unclear criteria for effective or ineffective performance, coupled with the size of the award made for outstanding performance (generally felt to be derisory).

Research suggests that individual learning per se is not enough to enable organizations to produce innovation on a sustained basis. Dougherty and Hardy (1996) show that determined and able individuals can frequently enact one-off innovations, but that unless the organization as a whole is prepared to take on board the learning generated by such individuals, they are unlikely to be repeated on a regular basis. Only a relatively small proportion of individuals within RPL had the opportunity to experience variety. Furthermore, there was little communication of the need for individuals to make the extra effort necessary to experience variety in some of the ways outlined above.

Conversely, it was apparent from discussion with management at Raychem that there was recognition of the importance of exposing everyone, from operators to senior managers, to new and different experiences. Those with responsibility for others were also asked to participate in the development of those reporting to them, for example, through providing them with coaching support, so that subordinates gained an appreciation of how to approach work differently. Managers who subscribed to the Masters' programmes endorsed by the organizations were expected not only to attend lectures, but also to give lectures around an area of expertise and thus contribute to the knowledge creation process.

RPL, in line with the Japanese philosophy endorsed by its parent company, attached limited value to formal qualifications, preferring to promote from within. Raychem exhibited the US preference for the acquisition of formal qualifications and managers in particular were strongly encouraged to participate in tailor-made Masters programmes designed to facilitate strategic and innovative thinking. One approach is not necessarily better than the other. According to Nonaka (1994, 1995), knowledge is generated as people engage in project work in multi-functional teams, and institutionalized as they develop routines and procedures to enact the ideas put forward. Japanese ideology therefore suggests that the workplace can be a powerful forum for the articulation and dissemination of knowledge. It probably makes sense, however, to suggest that where formal qualifications are not seen as important, there needs to be a strong emphasis upon the experience of variety and learning in the workplace. The RPL culture, whilst not penalizing people for making suggestions for improvement, did not appear encourage people to share their ideas with others. There was therefore little sense that groups of people were coming together with suggestions for improvement and innovation. In other words, there was difficulty in generating organizational, rather than individual learning.

#### Learning through management development

It is particularly important that managerial staff have the opportunity to generate knowledge, since as Ohmae (1989) notes, it is managers' 'high responsibility to rethink...business systems on a regular basis, to take them apart in their minds, to go through a disciplined mental process of decomposing them and then restructuring them from scratch.' Theorists refer to the fundamental importance of developing managers

where organizations are seeking to develop higher order learning. Eraut, Alderton, Cole and Senker (1998), for example, refer to the way in which leaders who exhibit coaching and mentoring skills have an important role to play in shaping the quality of the learning environment and creating the potential for innovation. Becherman, McMullen and Davidman (1998) argue that continuous learning will only happen where there is a strong belief among senior management that training, employee involvement, motivation, accountability and the ability to be self-managing are complementary ingredients of company success.

RPL management did not exhibit this type of commitment, possibly because few of them had themselves engaged in higher-level learning. As discussed above, many had been directly promoted from the shop floor and had not received any significant development to enable them to perform the role in a way that fostered innovation and creativity. On the other hand, there was a clear commitment exhibited at Raychem to develop its managerial staff, in the ways detailed above, but also through secondments, project work and work shadowing. Furthermore, managers would have gained significant new knowledge as a result of the importance attached to developing self-managed teams. It is highly probable that given such a context employees would be encouraged to manifest interest in learning, creativity and innovation, and this is borne out by the findings of the study.

Thus outstandingly innovative organizations are concerned with the development of managers, who, in turn, provide developmental and coaching support for their subordinates. The converse is also true: the managers at RPL, who had largely been promoted from the shop-floor, had not themselves been exposed to the developmental

experiences which may have led them to question the approach towards learning adopted by this organization. The result was that management were not perceived to be good generating new ideas. They were described by some respondents as 'stagnant' or 'complacent'.

Levinthal and March (1993) argue that organizational learning is constrained by the cognitive limitations of managers, who tend to favour approaches designed to improve existing practice, rather than seeking to direct resources into the exploration of new areas. They propose that such an approach can be damaging to the long-term interests of the organization, particularly in terms of its approach to innovation. There is a strong argument to suggest that at the time of the research exercise RPL were more concerned with exploitation- i.e. getting better at what they were already doing- than exploration, and that this approach was apparent particularly in relation to management development and people management. Whilst this may have been appropriate in the short-term, it meant that the organization was not in a strong position to embrace change should external circumstances change. Through not attaching a high priority to people management aspects of the business, Ricoh may not have been able to survive in the event of a change of ownership, for example.

#### The management of quality and of people

Leonard-Barton (1998, p.3) points out that 'the core capabilities which constitute competitive advantage have been built up over time and cannot be easily imitated.' Whether or not companies can do so may depend on a number of factors, such as the previous experience they have at managing quality. Evidence presented in chapter 3 suggested that organizations are most likely to exhibit learning orientation where there is

a culture of involving people in quality initiatives and a commitment to using quality as a tool to promote learning. Findings derived from this study suggest that Raychem was more aware of the need to adopt a strategic approach to the management of quality than RPL.

Literature suggests that within a manufacturing environment, people have to be managed in a way that enables the organization to achieve quality outcomes (Sitkin, Sutcliffe & Shroeder, 1994). Therefore, through understanding what approach the organization takes towards the management of quality, it is possible to gain insight into the extent to which the organization is committed to engaging in higher-level learning. Certainly, within RPL there was commitment to the achievement of quality standards. However, operators were not expected to take responsibility for quality at a very high level. There was interest in promoting 'Kaizen', a fairly low level quality control instrument designed to encourage staff to go 'back to basics', to adopt tidy working practices and to follow every detail of standard operating procedures. The training department in RPL had planned a series of half-day sessions at the time when this research exercise was conducted, sessions that were designed primarily for operators in order to communicate this basic quality advice. Raychem did not appear to attach high value to this type of intervention, which they would probably have perceived as too low level to meet the demands of the industry. They were instead concerned to use the quality standards laid down by customers and quality regulators in order to enhance the learning of everyone involved in the process. The production manager of Wire and Cables, for example, noted that before quality systems could work effectively it was necessary to change people, stating that '...when we started this whole process there were four major things we needed to do, one was change the

people, one was change the processes, one was to apply the systems and the other was to get the resources to do it.' The quality systems thus provided the impetus for the deep-seated commitment exhibited towards team working, flexibility and multi-skilling. In addition, the quality systems provided a rationale for bringing operators into direct contact with customers, and also for the operation of teams made up of members of different functional groups. Whilst evidence suggested that the organization worked to the highest quality specifications, senior members of the organization questioned the validity of some of the quality exercises imposed upon it: 'we have an unbelievable amount of testing, and the question is, do we really need to do all that.'

These points suggest that Raychem was attempting to use quality as a way of developing closer links with the customer, thus promoting 'total quality learning' rather than 'total quality control.' Sitkin, Sutcliffe and Shroeder (1999) suggest that total quality learning is appropriate where organizations experience high levels of environmental uncertainty – perhaps as a result rapid product life cycles and/ or the shifting strategies of competitors. RPL was not exposed to the external environment in the same way. It thus makes sense that RPL were more inclined to practice 'total quality control', in that operators were trained to endorse clear quality guidelines with little provision made for questioning their impact.

#### Learning through team-working

Investment in team training within RPL was limited. Efforts had been made improve team leadership skills when the managers of PPC tried to organize work through people operating in 'cells' rather than on the production line, but this initiative had not been sustained. Possibly as a result of this, team working did not appear to have been

widely acclaimed as a better way of working, and there was little indication that this approach would be more widely adopted across the organization. The high levels of energy and time invested by staff at Raychem in making teams work effectively were described in the previous chapter. The previous chapter presented evidence to suggest that Raychem was strongly committed to making teamwork effective, seeing the process as 'totally the only way forward.' This commitment meant that it was possible to overcome some of the difficulties attached to operating in this way- for example, shop-floor workers taking responsibility for decision-making. It also meant that the organization was willing to allocate resources to the development of teams over time and to recognize that team training was a continual process: '. it's a long, long haul.'

Teams are likely to play an important role in the process of managing workplace learning for a number of reasons. Teams present opportunities for individuals to acquire flexibility, which in turn leads to better performance, since team members can better anticipate problems through having an understanding of the whole production process. Secondly, through working in teams, particularly where the teams are working well, individuals frequently experience high levels of motivation. Evidence presented in chapter 7 suggests that positive affect at organizational level is associated with high levels of creativity and innovation. Thirdly, teams represent an ideal environment for the exchange of tacit knowledge and for the almost sub-conscious exchange of knowledge that is a feature of the situated learning perspective (Brown & Duguid, 1991).

#### Environment uncertainty

I alluded in the last chapter to Raychem's perception that it was operating in a highly volatile environment, where cuts in defense spending made it particularly

important that the organization was able to produce one-off specifications for a variety of customers. RPL, on the other hand, was not expected to establish a relationship with customers; the parent company took responsibility for the sales aspects of the business. So, it was clear that RPL had made efforts to enhance its relationship with the external environment, particularly through its engagement with 'Midlands Excellence' and with D.T.I. initiatives. But such efforts failed to produce high levels of innovation because there was insufficient recognition of the need to integrate knowledge acquired in this way through developing mechanisms for knowledge sharing. Enhancing team-working and communication skills was not seen as a high priority.

Evidence suggests that the opposite was the case at Raychem. As well as providing sustained support for the development of team-working skills, Raychem was committed to adopting a strategic approach towards the management of people and to using quality systems as drivers for change and innovation. These initiatives were set in motion because there was strong recognition by senior staff of the need to respond to environmental pressures.

### Conclusion

This analysis lends support to the model put forward in chapter 2, which forms the theoretical rationale for the thesis. Organizational learning happens as people experience variety at work, provided that such individuals have the team-working and communication skills to influence others and to apply the knowledge that they have acquired. This analysis is borne out to a large extent by findings presented in chapter 6. These suggest that high levels of innovation are achieved not just where individuals have opportunities to experience variety, but also where the organization gives a clear signal

that it values the contribution made by individuals who seek to work in this way. It is thus the combination of variety together with focus and direction for the acquisition of skills that results in the organizational learning required to produce innovation on a sustained basis.

This is in practice difficult to achieve. As Weick & Wesley (1995) assert, in many ways the term ‘organizational learning’ is an oxymoron: - ‘to learn is to disorganize and increase variety...to organize is to forget and reduce variety’. The case studies raised in this and the last chapter provide evidence to show that management development and effective team working are powerful triggers for organizational learning and innovation. Such activities make it possible for organizations to capture the knowledge of individuals and to develop shared patterns of thinking and acting, which can be challenged and superseded as they are found to be no longer relevant. Team working and management development may make it possible for organizations to engage in the ‘unlearning’ process described in chapter 1.

Furthermore, this comparative study provides evidence to suggest that the workplace itself is an important site for the development of the core capabilities that enable organizations to learn and to innovate. Stern and Sommerlad (1999) argue that workplace learning happens in three main ways. The first approach involves the use of planned interventions that take place in the workplace- for example, in-company management training programmes. The second approach also involves the use of planned interventions designed to support and structure the learning of individuals, such as job rotation, coaching, mentoring or work shadowing. The third approach takes the view that learning and work are closely interconnected, and that learning is part of

everyday work activity. Investigation of both case study examples reveals that Raychem was committed to all three of the approaches detailed above. Its training programme for managers involved formal study outside the organization, at Warwick University. The Masters programme endorsed was, however, designed to take account of the specific needs of the business, and managers were expected to provide input into the programme around particular areas of expertise. In this way, the programme addressed business needs, whilst encouraging participants to take a wider, strategic perspective. The organization was committed to multi-skilling; thus participants were expected to engage in job rotation and to provide coaching and mentoring support to subordinates. And it appeared to be accepted practice for the organization to form multi-functional teams drawing upon expertise from different parts of the company

Within RPL, the picture was somewhat different. It was a Japanese-owned operation, and the Japanese approach to learning and creativity has long been associated with a determination to help learners to solve problems as they arise on the shop floor. To this end, much importance was attached to the role of the coach, a person seen as skilled in transmitting information and responding to requests for help. It was reasonable to anticipate, therefore, that RPL would perhaps be stronger at providing support for the development of skills in the workplace. To some extent, this expectation was borne out by the study; many respondents alluded to the open and friendly culture of the organization, stating that they were able to ask questions and to put forward suggestions for improvements without fearing that any negative consequences may arise from this. A number of respondents commented on the quality of support that they had received from Japanese advisors. However, there was little evidence that anyone other than the Japanese

advisors was encouraged to take responsibility for coaching others and consequently there appeared to be limited organizational learning arising as a result of these initiatives. Furthermore, there was little recognition of value of coaching and mentoring others. Although individuals did cite how particular managers had enabled their development, whether or not this happened appeared to be largely a matter of chance.

In summary, this study suggests that highly innovative organizations adopt a distinctive approach to the management of workplace learning. They make widespread use of teams, they take particular care to develop managers effectively and they strive to use external accreditation as a mechanism for generating reflection and dialogue. They are also likely to adopt a strategic approach to the management of human resources and to have a clear and distinctive vision, both of the type of person who they would wish to employ and also of how existing employees are inducted, managed and motivated. The 'core capability' (Leonard-Barton, 1998) that they are seeking to develop emerges over the course of time, as a result of constant endeavours to promote creative thinking and to develop processes for capturing and disseminating knowledge.

#### Limitations of the study

This study draws upon qualitative data derived from in-depth discussion with selected members of the two organizations that form the basis of the analysis. Whilst there was a clear rationale for the methodology employed, the conclusions drawn from the study are based upon the perceptions and opinions of the respondents, which may not necessarily be representative of the feelings of other members of the organizations concerned. Clearly, organizations are comprised of different interest groups, each of which has a different understanding of the phenomena being investigated. Some interest

groups will, for example, emphasize the importance of initiatives put forward in order to make it apparent to the wider world that they have been instrumental in securing certain benefits for the organization. In any case, respondents can only raise issues of which they have direct experience. It is therefore possible that had I been able to talk to a wider range of respondents, a different picture may have emerged.

Furthermore, although this is a comparative study, circumstances dictated that I employed slightly different methods for each case study. For the Raychem study, I drew upon data gathered through interviews with managers. I also spoke with management at RPL, but in this organization I interviewed employees and was thus able to gain their views about management initiatives and the extent to which they were seen to be effective. This dissimilar approach may have had an impact upon the validity of the findings.

What was striking about the RPL study, however, was the degree of consensus between management and employees about the strengths and weaknesses of the organization. Data revealed that both management and employees had similar concerns, and a coherent overall understanding appeared to emerge from the two perspectives. Furthermore, the outcome variable for the study- low levels of overall innovation – was reported consistently across employee groups and sub-divisions of the business.

Conclusions drawn from the study are based upon the perceptions and opinions of the respondents, which may not necessarily be representative of the feelings of other members of the organizations concerned. Organizations are comprised of different interest groups, each of which has a different understanding of the phenomena being investigated. Some interest groups will, for example, emphasize the importance of

initiatives put forward in order to make it apparent to the wider world that they have been instrumental in securing certain benefits for the organization. In any case, respondents can only raise issues of which they have direct experience. It is therefore possible that had I been able to talk to a wider range of respondents, a different picture may have emerged. It is impossible to rule out this eventuality.

On the other hand, interviews were conducted with nominated experts in the relevant field, and since the respondents were talking to independent researchers, rather than senior members of their own organizations, it is hard to envisage why they should wish to mislead interviewers. Most importantly, a number of different sources were drawn upon for each of the organizations concerned. Within RPL, I spoke to nominated technical experts, to perceived 'high performers' in the organization and to employees in focus groups. Within Raychem, interviews were conducted with three senior managers- the Chief Executive, the Personnel Manager and the Production Manager for the Wire and Cables part of the division. In addition, for Raychem, the innovation scores were derived through a separate research exercise. A postal questionnaire was sent to nominated technical experts after the initial research exercise had been conducted. These data were then interpreted by researchers and scores allocated as described in Chapter 4. Within RPL, innovation scores were derived through discussion with technical experts who gave full details of their perception of the novelty and magnitude of the innovations described.

#### Implications for the thesis

Work to date suggests that the relationship between workplace learning and performance is difficult to substantiate. Most studies, described in chapter 2, have

considered the extent to which so-called 'high performance' practices have impacted upon organizational productivity and profitability. Uniquely, this study considers the extent to which practices designed to enhance learning result in the production of sustained innovation. The findings of this comparative study provide further support for theories based upon studies of highly innovative organizations, raised in chapters 1 and 2, and for the empirical studies presented to date. They suggest that to manage organizational learning, it is necessary to develop mechanisms to enable the sharing and dissemination of knowledge and to enhance the team-working and communication capabilities of individuals so that they have the skills to make use of the knowledge that they have acquired.

This and the previous study presented opportunities to explore, in more depth than is possible in quantitative analyses, employees' perceptions of the learning environment within which they operated. Through asking people for their understanding of the importance of initiatives designed to enhance learning, it was possible to understand what value employee attached to such initiatives. It was also possible to ascertain – particularly at RPL- the extent to which employees felt that the organization had omitted to address their learning needs. This was clearly a substantial factor for many people in preventing them from working with others to achieve change and innovation. Furthermore, it is reasonable to suggest that employees are unlikely to experience job satisfaction within such a context. Since analysis presented in chapter 7 in particular suggested that employees experiencing high levels of job satisfaction will be willing and able to achieve creative outcomes, this is potentially a serious problem for organizations seeking to produce innovation.

Most importantly, this study presents evidence to suggest that continuous innovation happens within a context where efforts are made to move beyond individual learning. For example, the RPL case suggested that highly motivated and able individuals were able to produce innovation by making active efforts to create learning opportunities as they emerged. But less talented individuals tended to become demoralized and to adopt a more minimalist approach to their jobs where there was no clear structure to facilitate the dissemination and application of knowledge. To produce on-going innovation, the Raychem case study suggests that it is necessary to make concerted efforts to share learning and to capture and apply ideas. Doing so represents a commitment to higher order learning, to 'double loop' or 'generative' learning (Argyris & Schon, 1978; Senge, 1990). Perhaps organizations do not perceive that it is worthwhile to make such efforts unless they are faced with highly turbulent environments. Qualified support for this proposition is presented in chapter 3. The final chapter of the thesis now considers the overall implications of the findings outlined in this and the previous chapters, and details suggested areas for future research.

## CHAPTER 10

Conclusions, theoretical and practical implications and suggestions for future research

### Introduction

What are the key findings emerging from this research? The work presented in all seven studies reveals that organizations can significantly improve their chances of producing innovation through effective people management. There are two main ways in which this happens. Firstly, people management practices, where appropriately designed, equip individuals with the knowledge and skills required to achieve creative outcomes. Secondly, a work environment promoting growth and learning enhances job satisfaction, which, in turn, stimulates learning and creativity and enhances innovation performance at organizational level.

By what mechanisms are such effects generated? Findings presented in the thesis suggest that knowledge and skills are enhanced as individuals learn from new and different experiences, and as they are provided with direction and support for their learning. This thesis suggests that a number of mechanisms facilitate this process. Career development discussions, for example, help to provide individuals with an understanding about what behaviours are valued and to generate a sense of long-term commitment to the achievement of learning objectives. Through supporting the development of coaching and mentoring skills, organizations increase the probability that individuals will be guided by more experienced practitioners as they seek to acquire and apply knowledge. Furthermore, evidence is presented to indicate that where there is clear support for strategic-level HR activity, individuals will be able to work well with others to produce innovation. This is particularly the case where strategic-level activity such as

human resource planning is employed in conjunction with practices guiding day-to-day practice, such as training and induction. Perhaps the most striking finding of the thesis is that mechanisms designed to promote variety (such as visits to customers), used together with interventions intended to develop skills (such as appraisal), tend to have more impact upon innovation performance than is the case where these sets of variables are implemented separately.

Evidence is also presented to suggest that it is possible to draw a distinction between highly innovative and less innovative organizations by focusing upon the way in which learning is managed. Case study research reveals that management and HR staff in highly innovative organizations are pro-active in looking for learning opportunities as they occur in day-to-day practice. For example, such organizations use quality systems to emphasize the importance of establishing a frequent dialogue with customers., rather than as devices to enhance managerial control. The significant investment in training exhibited in such organizations enhances knowledge and skills and provides direction and support for individual and organizational learning.

Evidence presented in chapter 7 reveals that job satisfaction- measured at organizational level- is positively associated with the innovation performance. Employee perceptions of the opportunities that the work environment presents for autonomy, flexibility and training, in turn, have a direct influence on job satisfaction. This suggests that people management practitioners have an imperative to manage the work environment in a way that elicits job satisfaction. There are a number of ways in which this can be achieved. Effective reward systems, for example, provide people with appropriate recognition for behaviour that is valued(Milgram & Roberts, 1992;.

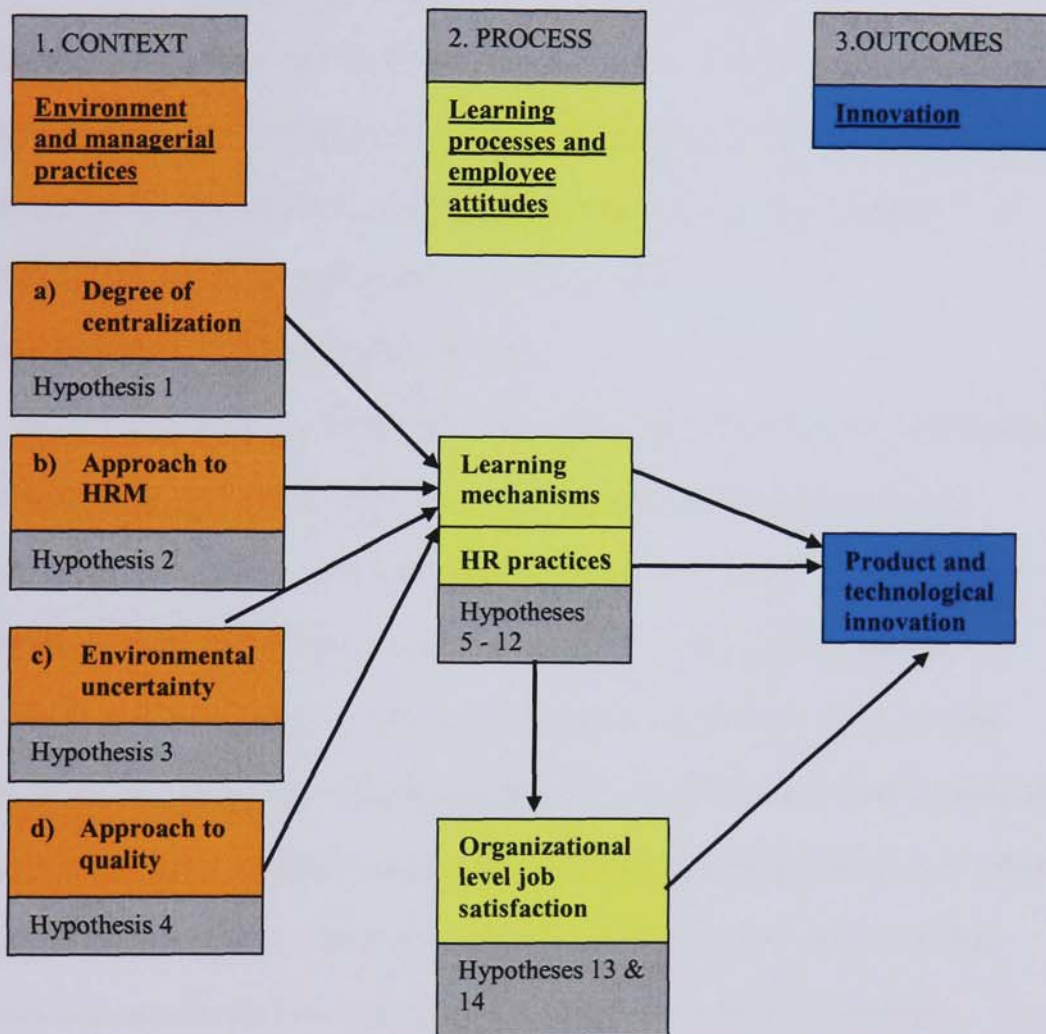
Milkovich & Newman, 1996) Training activities increase the propensity of individuals to contribute at a high level to the achievement of organizational goals, thereby adding to the interest and variety implicit in the job itself (Delaney & Huselid, 1996; Harel & Tzafrir, 1999; Lawler, Mohran & Ledford, 1995). Performance management, conducted effectively, adds to individuals' perceptions that their contribution is respected and valued (Erez, 1977; Bandura & Cervone, 1983). The rationale for such endeavours is the positive association between organizational-level job satisfaction, exploratory learning, experimentation and innovation (Isen & Baron, 1991; Isen, Daubman & Nowicki, 1987).

The research design exhibits a number of strengths. Technological innovation in manufacturing organizations was used as the outcome variable for several of the studies. Thus the theoretical rationale for the thesis – that there would be a positive relationship between people management, organizational learning and innovation- could be tested empirically. Furthermore, conclusions derived from the research exercise were based upon data drawn from a wide range of sources. Innovation was measured through consultation with technical experts by means of a postal survey. Learning mechanisms and HR practices – and indeed the contextual factors that formed the basis of the first study- were calculated through in- depth interviews with relevant professionals. The job satisfaction data were derived through asking people for their perceptions of the work environment and their feelings about work. Furthermore, I was able to make use of longitudinal data. Conclusions were derived from data gathered at three separate points in time. This made it possible to control for extraneous variables such as prior innovation, so that I was able to put forward a stronger case for a causal relationship between

dependent and independent variables. It also meant that it was possible to allow for the impact of measures designed to enhance learning to take effect.

Qualitative studies were used in conjunction with quantitative approaches. Two chapters explore the relationship between learning and innovation at Raychem UK and Ricoh, Telford. These qualitative studies present a more in-depth analysis of learning within a particular context than was possible for the other studies presented in the thesis. They complement the quantitative studies in a number of ways. The qualitative studies suggest that internal variety can be engendered through creating opportunities for individuals to work in teams, for example, or through adopting a developmental rather than a controlling approach to the management of quality. Undertaking a comparative analysis was also valuable. It enabled me to assess the limitations associated with the approach adopted by the first organization, in a way that would not have been possible had I been unable to refer to a 'best practice' organization. Secondly, I used the insights gained through analysis of learning and innovation at RPL to present a justification for focusing in some detail upon support for team-working, management development and quality orientation when transcribing data drawn from the Raychem research exercise.

# Model guiding the research



This section considers each part of the model in turn and explores the theoretical implications implicit in the research as a whole. Four parts of the model are reviewed as follows. Part 1 considers the circumstances in which organizations adopt measures designed to promote high-level learning. Part 2 asserts that learning mechanisms and HR practices promote organizational learning and innovation; part 3 argues that such interventions enhance job satisfaction, which has an important role in play in facilitating exploratory learning and innovation and part 4 proposes that innovation represents the institutionalizing stage of the organizational learning process.

#### Part 1: Environmental and managerial practices

The first stage of the model proposes that a number of factors in the external and internal environment determine whether or not organizations implement measures designed to enhance organizational learning, or 'learning orientation'. The following variables were used as a basis for testing the applicability of the model in practice: environmental uncertainty, quality orientation, approach to HRM and organizational structure. These variables were selected because there is a substantial theoretical rationale for proposing that they are highly significant in predicting successful performance within the manufacturing sector. The theoretical rationale for focusing upon environmental uncertainty, for example, is that organizations need to develop structures that are appropriate for the environment in which they operate (Lawrence & Lorsch, 1967, Burns & Stalker, 1961). In other words, if the external environment is volatile, or is perceived to be so, organizations will be inclined to make the effort necessary to manage learning pro-actively

Substantial, but not full, support for this theoretical proposition was found in the research study presented in chapter 3. I found a positive relationship between one aspect of environmental uncertainty, i.e. perceptions of technological uncertainty and technological innovation. I suggest that this is because in a manufacturing environment survival depends upon employees being able to cope with changes in technology. Technological uncertainty thus shapes the extent to which organizations exhibit a commitment to employees' learning and development. This point is further supported in the case study research. Both Raychem and Ricoh were required to make use of sophisticated technology in order to compete in specialist markets. However, Ricoh relied upon Japanese advisors to update staff upon on new developments in this area, whilst Raychem were expected to bring in the new technology themselves, in order to gain customer and quality accreditation body approval. Raychem were thus required to invest in the staff learning of that everyone was able to achieve or exceed the quality standards laid down by accrediting bodies. Ricoh, however, did not attach the same degree of importance to the staff learning, because their perception was that they were operating in a fairly stable environment, meeting the demands of the parent company in Japan. There were therefore fewer mechanisms in place to provide focus and support for learning activity.

As a further point, and in support of the model, both the case study research, and the study reported in chapter 3, suggest that quality systems create a perception of the need to adopt mechanisms designed to trigger high-level learning. Furthermore, this research supports the idea that highly centralized structures are detrimental to perceptions

of the need to adopt such mechanisms. This may be because managers in such structures are reluctant to endorse learning activity that may threaten the status quo.

It is important to consider the extent to which organizations actively support learning for a number of reasons. Firstly, where no such efforts are made, individuals will not necessarily have the skills or the motivation to create learning opportunities for themselves. Secondly, through managing learning, organizations may be able to draw upon individual learning in a way that facilitates the achievement of important organizational objectives. It is simplistic, however, to assume that organizations can choose to implement measures intended to develop higher-level learning, as proposed by some scholars of the learning organization school of thought. The willingness of key players to instigate such mechanisms is shaped by many factors, particularly by perceptions of the need to change and in terms of the history that they of managing people effectively. Furthermore, findings suggest that where organizations are required to invest regularly in new technology and new quality systems in order to maintain competitive advantage they will be more likely to support employees as they learn than where the converse is the case.

## Part 2: Learning processes

This stage of the model considers the extent to which learning mechanisms and HR practices enhance organizational learning, resulting in innovation. A number of theoretical assertions in support of this point are made in Chapter One. Firstly, it is held that organizations that are able to capture and disseminate knowledge – in particular, tacit knowledge- perform better than those that have no such capability (Lam, 2000; Nonaka & Takeuchi, 1995; Spender, 1996). Secondly, theories of social capital propose that

where individuals have the opportunity to interact with one another and to establish networks, they develop mutually beneficial sets of obligations that facilitate the exchange of knowledge (Bourdieu, 1986). Thirdly, the situated learning perspective asserts that individuals learn through being part of a community of practice, therefore, any interventions intended to enhance learning and knowledge dissemination should take account the immediate work environment (Brown & Duguid, 1991).

These theoretical arguments were borne out in the studies presented in chapters 4-5. Strong, positive relationships were found between learning mechanisms, HR practices and technological innovation. These findings are particularly striking because they apply not just to mechanisms associated with employee development, but also to practices that fall within the broader remit of people management. For example, there is a significant, positive relationship between induction and technological innovation, and between endorsement of HR by the senior management team and this outcome. I argue that this is because such mechanisms facilitate the creation and dissemination of knowledge. They also make it possible for organizations to develop social capital. For example, individuals who undertake job rotation and who regularly visit customers and suppliers are likely not only to acquire knowledge but also to influence others to take account of best practice ideas. Employees who are involved in coaching and mentoring programmes and who learn about processes that occur in other parts of the factory will establish new networks and allegiances through the conduct of such activities, thereby generating social capital. Furthermore, career development meetings, secondments and other HR initiatives such as induction promote workplace learning. They are thus likely to be seen to be relevant by

individuals seeking to be accepted as effective practitioners, in accordance with the situated learning perspective.

Theory and research suggest that the mechanisms detailed above must operate in conjunction with one another if they are to foster a climate of continuous learning. Mumford (1997), for example, refers to the importance of project work, regular visits to customers and suppliers and of having plans for development and action learning. Others argue that organizations need to make use of performance appraisal, mentoring and coaching and self-managed work teams (Ashton & Felstead, 2001). Lank (2002) proposes that organizations should take a strategic approach towards the management of knowledge, whilst O'Dell and Grey (1998) propose that organizational reward systems should recognize the value of sharing and exchanging knowledge and best practice.

There is some evidence to suggest that such integrated practices tend to be adopted by organizations that focus upon innovation and product differentiation (Becherman et.al. 1997). This research would support such assertions. Organizations in the study that have high levels of innovation tend to have in place many of the mechanisms recommended by best practice literature. Such organizations also tend to invest in the development of shop-floor operatives, as well as managers. By doing so, they increase the probability that knowledge is acquired as employees engage in collaborative dialogue across organizational hierarchies.

A further premise of the thesis, expressed in the model, is that organizational learning results when opportunities are presented for individuals to experience variety, when at the same time mechanisms are established to provide direction and support for the acquisition of team-working and communication skills. Following Crossnan, Lane

and White (1999), I argue that this is because the experience of variety enables individuals and groups to 'intuit' and 'interpret' knowledge, whilst through developing team-working and communication skills, individuals, groups and the organization as a whole is able to integrate and institutionalize knowledge. Evidence is presented in chapter 6 in support of this argument. There is a pronounced interaction effect between the measure of internal variety and appraisal, for example. There is also a statistically significant interaction effect between human resource planning and training. In other words, organizations committed to enabling employees to experience internal variety, whilst at the same time providing a focus for the development of skills, produce higher levels of innovation than organizations that do not employ such mechanisms in support of one another.

Similar findings are observed in the case study examples presented in the final two chapters. Raychem was committed to exposing employees to new learning experiences as opportunities emerged. For example, operators were expected to work with multi-functional teams to present their solutions to wider management in the event of significant quality problems. Raychem were at the same time willing to invest significantly in the team-working and communication skills of the workforce, arguing that only through doing so was it possible to empower teams to take responsibility for outcomes such as quality. Ricoh, on the other hand, had few, if any, formal mechanisms in place to facilitate the acquisition of team-working skills. Some opportunities did exist for individuals to experience variety, but such opportunities were not made widely available across the work-force, and tended to be taken up by experienced and motivated practitioners, who could see a clear route for their own career development. As a

possible consequence, higher levels of technological innovation were reported in Raychem than in Ricoh, despite many other superficial similarities between the two organizations.

The theoretical framework put forward at this stage of the model represents an important new perspective to be taken into account by organizational practitioners. It suggests that those concerned with learning in organizations need to achieve a balance—on the one hand, challenging peoples' thinking through exposing them to new and different experiences, on the other hand providing them with the support necessary to make sense of the experiences. The importance of adopting such a balance is widely recognized in the organizational effectiveness literature, as discussed in the first chapter. The implications of such a perspective for those responsible for managing learning have not always been made clear, however. If the intention is to formulate new and different perspectives, employees should be encouraged to learn through exploring new territories—both within and outside the organization, through secondments, dialogue with internal experts and liaison with customers, for example. If instead the goal is to make it possible for knowledge to be applied (to produce innovation), the organization needs to make use of mechanisms such as appraisal, formal induction and training. Where organizations adopt a strategic approach to the management of people, through human resource planning and through gaining the support of the whole management team for people management, it becomes possible to both explore new territories and to make use of existing knowledge. This thesis provides substantial evidence in chapters 6, 7 and 8 to support this point.

### Part 3: Employee attitudes

The studies discussed above were concerned primarily with the structural mechanisms organizations can employ in order to improve upon the quality of organizational learning. This study takes into account the cultural dimension; it explores the extent to which peoples' feelings about work and about their relationships with one another are significant. This theme is frequently addressed within the organizational literature: for example, Argyris (1996) argues that organizations have difficulty in achieving 'double loop' learning because defensive reactions arise when individuals are encouraged to reflect on possible areas of improvement in practice. Furthermore, there are strong arguments to suggest that knowledge will be exchanged in situations where individuals and groups experience high levels of trust, liking and respect for one another (Mishra, 1996; Edmondson, 1999). George (1996) suggests that where the majority of members of a group experience positive affect, they tend to exhibit high levels of cognitive flexibility and creativity. Perhaps such feelings are amplified where the majority of individuals within an organization experience job satisfaction. This would suggest that organizations vary in the extent to which they elicit job satisfaction from employees and that when exploring the antecedents to innovation performance researchers may find it helpful to focus upon organizational-level measures of this attitude.

Evidence presented in chapter 7 supports such propositions. It reveals that there are statistically significant relationships between organizational-level job satisfaction and various types of technological innovation. Indeed, job satisfaction accounts for 41% of the variance for innovation in production technology. The study further suggests that

employee perceptions of autonomy, training and participation have an effect upon innovation because of the way in which they elicit job satisfaction.

These are important findings, especially given the limited research that currently exists to address this point. What implications do they hold for theory development in organizational learning? Mechanisms designed to promote learning will work effectively where employees feel positive about them. Job satisfaction releases the creative potential of individuals by promoting cognitive flexibility (Isen & Baron, 1991). To ensure that learning opportunities are valued, managers need to recognize and reward good practice (apparent where individuals are willing and able to make a contribution to all four stages of the organizational learning cycle). To promote job satisfaction, managers should seek to manage the organizational climate so that individuals perceive that they can work relatively autonomously, that they can participate in organizational decision-making and that new ideas will be given consideration. The learning mechanisms considered in chapters 4, 5 and 6 might enhance job satisfaction, for two reasons. Firstly, through implementing such mechanisms, organizations present a powerful message to the effect that learning and creative activity is important. Secondly, individuals with the knowledge and skills to make the most of such opportunities may experience intrinsic motivation and perhaps the 'flow' associated with high levels of creative performance (Csikszentmihalyi & Sawyer, 1995). Thus job satisfaction and innovation can be mutually reinforcing. Structural mechanisms designed to enhance learning are important both because they develop knowledge and skills and because they make it possible for people to engage in more satisfying, motivating and interesting work. It therefore makes sense to suggest that employees should have the opportunity to participate in decisions

made about what learning mechanisms to use and how jobs can be designed to enhance learning potential.

#### Part 4: innovation as the outcome of organizational learning

A key challenge facing researchers investigating organizational learning lies in establishing what measurements to use when analyzing cause/ effect relationships. As discussed in the first chapter, there is by no means a consensus about what organizational learning is, regardless of whether or not it is possible to enhance outcomes. This makes it difficult to establish empirically what mechanisms are most likely to be associated with effective performance, despite general acknowledgment that learning is a fundamental pre-requisite for organizational survival. There is, for example, a dichotomy between ideas put forward by scholars of the learning organization literature and actual practice. Exhortations to engage in 'double loop' learning (Argyris & Schon, 1978; Argyris, 1996), to develop practices for 'looking out' and 'looking in' (Pedler, Burgoyne & Boydell, 1999) and to expose individuals' mental models (Senge, 1990) present a coherent strategy to which organizations can aspire, but provide only limited guidance as to how such a strategy may be implemented.

A number of common themes run through the literature. For example, researchers propose that organizational learning is concerned with knowledge creation, and that the learning leading to innovation happens as organizations produce, combine and exchange knowledge (Kogut & Zander, 1992; Nahapiet & Ghoshal, 1998; Nonaka & Takeuchi, 1995). There are substantial challenges attached to managing learning in this way. For example, perceptual limitations and 'competency traps' make it difficult for organizations to engage in exploratory learning (March, 1991; Tushman & Anderson, 1986). In other

words, it becomes increasingly difficult to effect change where organizations become competent at performing an activity because it is difficult for managers to take an objective view about whether such competent activity is important for long-term competitive survival and success (Levinthal & March, 1993). Furthermore, unless practitioners can see a direct relationship between planned learning activity and their effective performance as practitioners, they will be unlikely to endorse such efforts (Brown & Duguid, 1991).

My definition of organizational learning draws upon a framework presented by Crossnan, Lane and White (1999). This framework presents an argument to suggest that organizational learning that is well managed leads to strategic renewal. So an organization's capacity to learn effectively can be gauged in relation to the willingness of its members to embrace change. However, not all change- for example, cost cutting or redundancy- is the result of creative endeavours. Innovation, however, is the tangible outcome of creative activity. I therefore suggest that the effectiveness of organizational learning can be gauged insofar as innovation is produced on a sustained basis. I also suggest that in order to produce sustained innovation, organizations need to develop mechanisms for managing all four stages of the organizational learning cycle - intuiting, interpreting, integrating and institutionalizing. Thus, organizational learning does not become self-limiting. Furthermore, where each stage is handled well, organizational members can see the purpose and benefits of engaging in learning and developmental activity, because through doing so they become increasingly able to make a contribution to the achievement of important organizational outcomes.

I discussed in the first chapter the different ways in which people management practices have the potential to impact on all four stages of the organizational learning cycle. At the intuiting and interpreting stages, it makes sense to expose individuals to new and different experiences, perhaps through the use of secondments, job rotation or short-term project work. Formal opportunities away from the work environment- for example, studying for a degree or professional qualification- may also create internal variety through exposing protagonists to new and different paradigms. For the integrating stage of the process, it is important to make use of mechanisms such as appraisal and induction that can provide support and direction for the development of team working and communication skills. Institutionalizing happens as routines and procedures are established to guide best practice. It makes sense to suggest that performance management, training, reward and induction activities influence the extent to which knowledge is codified and procedures adhered to. This thesis thus presents a framework for understanding how people management practices facilitate the organizational learning required to produce sustained innovation

Nevis, DiBella and Gould (1995) argue that organizations have different learning orientations, that some are better than others at drawing knowledge from the external environment, for example. They also argue that it is possible to make fundamental shifts in a learning orientation once the preferred style has been identified. Where one has a clear outcome variable, such as innovation to establish whether or not organizational learning is working effectively, it becomes possible to conduct such a diagnosis. For example, where there are low levels of innovation perhaps there are not enough opportunities made available for individuals to experience variety. Perhaps also where

there are low levels of innovation, insufficient attention is given to the development of team-working and collaborative skills. Such a framework makes it possible for organizational practitioners to decide which people management interventions should be employed, depending upon where the problem appears to be sited.

### Limitations of the research

One of the main limitations of the research is that it does not directly measure organizational learning. There are a number of methodological approaches that I could have adopted in order to do so. The 'learning curve' perspective, for example, presents empirical evidence to show that organizations, like individuals, learn at different rates, and that it is possible to intervene to maximize positive results (in productivity terms). The creativity literature explores the extent to which it is possible to manage the work environment in order to produce ideas and knowledge. Other work argues that one can establish whether or not organizations learn effectively by asking for employees' perceptions of the learning environment and their willingness to endorse change, as I did in the study presented in Chapter 7. Another perspective proposes that people are asked directly whether or not they believe that organizational learning is effective. One study, for example, draws upon Nahapiet and Ghoshal's (1998) typology and asks employees for their perceptions of organizational capacity to 'assimilate' and 'exchange' knowledge (Farrel, Flood & MacCurtain, 2003). It may also be possible to measure organizational learning by adjusting the 'reflexivity' scales detailed in chapter 1. This would make it possible to explore a number of organizational attributes that are fundamental to organizational learning, such as the extent to which there is organizational-level support

for new ideas and whether or not people are encouraged to take time out from work to reflect on activities.

I decided to use innovation as my main outcome variable for the study because I felt that one could not be sure that organizational learning had taken place without analyzing what changes in practice had occurred as a result of the learning. This approach linked to the Crossnan, Lane and White (1999) framework, which formed the basic theoretical rationale for the thesis. However, the study would have been considerably strengthened had it been possible to take into account other measures. For example, I could have asked employees for their perceptions of the organization's management of each of the four stages of the process alluded to above. I could also have established whether or not there was a relationship between employees' endorsement of organizational learning and their willingness to embrace change. Alternatively, and given more time, it may have been possible to assess the extent to which organizational learning mechanisms enhance productivity, or lead to higher levels of creativity, by measuring outcomes before and after their implementation. However, in practical terms it was not possible to generate such data, and these ideas remain possibilities to be considered in future research.

The measures for internal variety and skill development could be stronger. For example, there is no direct evidence to support the argument that appraisal fosters the development of team-working and communication skills, although a strong theoretical rationale can be made for this point. Neither does the measure of variety take into account the many different ways in which organizations can expose individuals and groups to new and different experiences. Research and theory suggest that one should

seek to enhance variety through exposing a broad range of 'receptors' to the external environment (Cohen & Levinthal, 1990). Variety can also be created within the organization. Tsai (2001), for example, shows that departments or 'units' that had significant interaction with other parts of the business performed better than those that had less opportunity for communication. This point is considered in more detail in the next section.

The model presented a useful framework for guiding the research, but it has some limitations. For example, the model is intended to suggest that a learning orientation is manifested where factors within the internal and external context enable this to happen. This possibility was not tested to its full extent; findings presented in chapter 3 focus upon learning mechanisms, and do not explore the relationship between contextual factors and HR practices, although the model suggests that I test for this possibility. Furthermore, as I pointed out in the study, there is likely to be substantial overlap between dependent and independent variables for this study, in that organizations which manifest learning orientation are likely to have at the same time effective HR practices. Furthermore, I have not explicitly tested for the relationship between learning mechanisms/ HR practices and organizational-level job satisfaction. There is a strong theoretical argument to suggest that where employees perceive that the learning environment offers them opportunities for autonomy, training and creative thinking they will experience job satisfaction, and this was to some extent borne out by the findings presented in chapter 7. One could suggest that learning mechanisms and HR practices will create an environment within which employees are able to experience job

satisfaction, but this is a hypothetical possibility which is not directly considered in the research.

The methodology that I employed does not make it possible for me to draw causal inferences from the study. Although most of the data are longitudinal, thus strengthening the case for cause/ effect relationships, it is possible that the outcomes noted could be attributed to other factors- leadership, for example-, which have not been measured. Furthermore, sample sizes for the quantitative studies are small. This means that one has to interpret with caution any conclusions drawn from the findings. Finally, the data for the main qualitative study, presented in chapter 8, are cross-sectional. This again weakens the case for causality.

#### Next steps in research

There is no clear consensus about what organizational learning is and its relationship to performance. Some protagonists take the view that individuals who are committed to learning will automatically share their knowledge with others, thereby enhancing organizational performance (Senge, 1990; Pedler, Burgoyne & Boydell, 1999). Others suggest that the routines and procedures established to guide the enactment of knowledge present barriers or 'competency traps' that seriously impede an organization's capacity to change and adapt (Nelson & Winter, 1982, March & Olsen, 1975). Others propose that organizational learning takes place automatically within communities of practice, and that managerial intentions to enhance learning frequently ignores the needs of such communities. Although there is general acknowledgment that organizational learning cannot happen without the engagement and motivation of people,

little empirical work has considered what impact people management may have upon the effectiveness of the process.

This lack of conceptual clarity presents many opportunities as well as challenges for researchers. Firstly, one needs to have a clear outcome variable, and some possibilities appertaining to this point were raised in the last section. This should make it possible to conduct research, preferably of a longitudinal nature, in order to gauge what interventions are most likely to promote positive results. Secondly, building upon the findings of this study, to what extent do people management practices increase individuals' propensity to share knowledge with others to produce sustained innovation? In other words, what learning mechanisms promote variety and what HR practices enhance skill development? Furthermore, what factors in the organizational context make people willing or motivated to challenge and question existing routines, policies and procedures so that the organization does not become prone to short-term, limited thinking? Finally, how can learning be managed so that people perceive that their experiences are relevant but nonetheless challenging?

In relation to the first point, future research studies could develop more robust scales for the measurement of variety and skill development. Studies could build upon the findings of this thesis to establish whether there is evidence of a positive association between high scores on these scales and a number of possible outcomes, such as creativity, innovation and performance. For example, to what extent do people interact with the external environment- not just through liaison with customers and suppliers, but also through benchmarking practice in other companies, through engaging in professional development activities and/ or through attending trade fairs/ conferences that facilitate the

exchange of knowledge? Are there opportunities for individuals to share best practice within the organization and to what extent is there dialogue between functional areas, as evidenced, for example, through use of cross-functional teams, or through the number of communications apparent between one department and another? How does the organization seek to develop team-working and communication skills? Is there a positive relationship between a willingness to support individuals as they work collaboratively with others and outcomes such as those noted above? Researchers could investigate performance management systems in order to establish what value is attached to the development of such skills, and what support is available to encourage people to share their ideas with others- both in financial and motivational terms. Given the significant negative relationships noted in this thesis between appraisal linked to pay and innovation, future research could look in more detail at whether performance-related pay inhibits or facilitates organizational learning. Furthermore, since this research suggests that appraisal, induction and training are important predictors of learning and innovation, future research could look in more detail at why this may be the case. Is it the focus or the support that is most important for individuals in enabling them to engage in the collaborative behaviours necessary to produce innovation on a sustained basis? Is there a point at which high levels of support and focus inhibit creative outcomes? These questions are important because they are concerned with how best to achieve an equilibrium: on the one hand exposing individuals to new and different perspectives, whilst on the other seeking to impose control on the direction of learning and its application.

Longitudinal, quantitative data, gathered from a larger number of relatively homogeneous organizations than were considered in this study, could provide further insights into these questions. Rather than relying on management, it would be valuable to extend the analysis to consider the perspectives of employees. This would make it possible to develop a richer understanding of precisely what mechanisms are most likely to facilitate organizational learning, and how this happens. Furthermore, the analysis could be extended to include different types of organizations- not-for-profit organizations, or public sector enterprises, such as local authorities or hospitals.

I alluded above to the importance of exploring what factors in the organizational context make people willing or motivated to challenge and question existing routines, policies and procedures. The model suggests that organizational-level job satisfaction predicts innovation, perhaps because of the way such feelings elicit cognitive flexibility and creativity. However, it is possible to envisage that in some circumstances job satisfaction – for example, where it is linked to perceptions of job security- will not be positively associated with creative outcomes such as innovation. Therefore, the next step is to develop a scale for measuring intrinsic motivation. The application of such a scale would reveal whether or not individuals are motivated by the learning opportunities which are available to them and whether they derive satisfaction from the effective conduct of work activity. Perhaps in such circumstances, people will be more inclined to question existing practice, and organizations less prone to competency traps.

This question could be investigated empirically by conducting a comparative study of good and less effective practice. For example, where there are many opportunities for learning available, and/ or where people have opportunities for working

autonomously, are higher levels of intrinsic motivation to be found than where the converse is the case? Is there a positive relationship between intrinsic motivation and outcomes such as innovation, or other measurements of organizational capacity to assimilate and exchange knowledge?

Finally, how can learning be managed so that people perceive that their experiences are relevant but nonetheless challenging? The model suggests that it is important that people have focus and direction for learning activity. Furthermore, most of the learning mechanisms used as a basis for the study are routed in the workplace and thus likely to be perceived by employees as relevant to the conduct of their jobs. However, the next step would be to test these points empirically. One method would be to ask people which learning opportunities they believed to be most valuable. Supervisors could then be asked for their ratings of subordinates' performance, either in terms of the achievement of goals or in relation to the number of new ideas put forward. This would go some way towards revealing, firstly, employee perceptions of the value and importance of learning interventions, and secondly whether or not such perceptions of value result in individuals being able to perform well in the workplace.

#### Implications for practitioners

What steps can practitioners take to facilitate learning and to increase the propensity of organizations to produce sustained innovation? Findings presented in this thesis suggest that some organizations will be in a stronger position than others to implement measures designed to promote higher order learning. This is particularly the case where there is a perception that technological change is endemic and where there is a commitment to achieving high quality standards. There is a negative relationship

between measures of centralization and organizational propensity to learn. Managers would be advised, therefore, to look at ways of removing hierarchical boundaries. Quality programmes may play an important role in gaining the support of the wider organization for taking a more proactive approach to the management of learning. This is also the case where there is a clear need to update technology regularly. Thus it makes sense to suggest that those managing organizations should make incremental changes to ways of operating before endorsing full commitment to a wide range of learning practices. The Raychem study also suggests that quality accreditation processes should be used as developmental opportunities, and that the skills of working collaboratively with others are acquired as people operate within semi-autonomous teams, so practitioners should look at ways of starting to manage learning proactively by directing attention to these areas.

The thesis reveals that where organizations adopt a strategic approach to people management they are more likely to produce sustained innovation than where the converse is true. Organizations therefore need to ensure that senior managers are convinced of the importance of managing people consistently and supportively, and have a plan to anticipate demand for skills and knowledge. The case study examples suggest that individuals are unlikely (unless they are particularly able and motivated) to engage in learning activity that is not recognized and rewarded by the management team. Therefore, consideration needs to be given to messages communicated during appraisal, induction and training. I argue that these people management practices are important because they make it possible for people to work together to integrate and institutionalize knowledge.

Furthermore, and perhaps most importantly, organizations seeking to produce sustained innovation need to encourage individuals to acquire knowledge and to work independently to bring new ideas into the organization. Developmental activity therefore has to achieve two purposes: to expose people to new experiences, and to support them as they gain the skills necessary to engage in collaborative dialogue with others.

Mechanisms designed to promote variety facilitate risk-taking and experimentation, whilst practices intended to develop skills make it possible for individuals to perceive how their ideas and those of others around them can be applied. A strategic approach to people management should ensure that both sets of mechanisms are used in conjunction with one another.

What has been learnt overall about people management, organizational learning and innovation? To produce innovation on a sustained basis is a huge challenge. Some organizations are able to operate in this way, but they are relatively few in number. I suggested in the introduction that one possible reason for such disparity in practice lies in the way in which people management practices are employed. This thesis has presented a theoretical and empirical rationale in support of this argument. Furthermore, the thesis has presented a case to suggest that people management practices are positively associated with innovation because they promote organizational learning. Thus, developmental activities equip individuals with the knowledge and skills required to acquire and apply knowledge. Furthermore, through experiencing learning and growth, individuals achieve satisfaction at work, an attitude that in itself is conducive to on-going learning and creativity.

The German philosopher, Goethe, proposed that ‘things which matter most must never be at the mercy of things which matter least.’ I argue in this thesis that what matters least in organizational life is being committed to ideas and principles which are no longer relevant. What matters most is that organizations learn how to innovate and to question existing ways of working. Thus, organizations draw upon the talent and motivation of the people they employ, and position themselves to meet the challenges of years to come.

## APPENDICES

# Organisational Change Survey

## Instructions

This questionnaire is designed to establish the level and type of organisational change experienced in the last two years and planned over the next two years in your company. It is a repeat survey based on research conducted in your organisation in 1994. This survey is part of a major initiative designed to promote effective change management in UK industry.

Your responses will only be seen by members of the research team and individual confidentiality is assured. However, we still require you to complete the background details below to help us analyse the data.

Please note that this survey has been sent to a small number of other managers in your organisation. This is to ensure that we can assess the extent of agreement in opinions amongst those in your company about change.

We would like you to complete each of the six sections of the questionnaire. If you belong to a company with more than one site, it is important that your answers relate to **your site only**. If you find it difficult to be totally accurate in response to a particular question (e.g. those involving percentages), please answer nevertheless by giving your best estimate.

Written feedback on how your company compares with others will be available 12 weeks after receipt of your completed questionnaires. We will also be happy to provide more general feedback by telephone at an earlier date. The attached report details the findings from the initial survey.

## Background Details

Line 1

1. Your company name: ..... 2 Compia 1-4
2. Your company site/location: .....
3. Your position/job title: ..... 2 Jobs pos 5
4. Total number of employees at your company site (approx. Full Time Equivalent): ..... 20
5. Total number of *production* employees at your company site (approx. Full Time Equivalent): ..... 25
6. Length of time you have worked in your company? ..... years ..... months 2 years
7. Please tick the appropriate industrial sector:  
 Engineering ☐ Electronics ☐ 20 Compia 1-4  
 Plastics ☐ Food and Drink ☐  
 Other (please specify) ..... YEARS / MONTHS

## Section A: Changes in products

1. Has the company (your site) started making any new products in the last two years?

IS

Yes

☐

1

0

No

☐

if "no" go straight to question 5 below

If yes, estimate the number of these which are:

- entirely new products (i.e. a different range)

..... 1

- adaptations of existing products (i.e. the same range as previously)

..... 1  
enter estimated number in spaces provided

2. What percentage of production workers are involved in making these entirely new products?

65-67

Enter percentage estimate

..... %

3. What percentage of your current sales turnover is accounted for by these entirely new products?

25-30

Enter percentage estimate

..... %

4. To what extent have you had to change your production processes in order to accommodate these entirely new products?

please tick the appropriate box

1 Not at all ☐

A lot ☐ 4

2 A little ☐

In major ways ☐ 5

3 Moderately ☐

Almost completely ☐ 6

5. Do you have plans to introduce new products (entirely new or adaptations) in the next two years?

Yes

☐

1

No

☐

0

(BUT NEW, 2 FUTURE?)

## Section B: Changes in production technology

Such changes could include, for example, the introduction of new machines or systems, such as CNC, robots, single cycle automatics, self-feeding machines, etc.

1. In the last two years have you introduced changes in production technology?

3 TECHNOL 39

Yes ☐ **1**

**0** No ☐ if "no" go straight to question 5 overleaf (page 4)

If yes, please list the three most significant changes below:

3  
Technology 1  
to 3  
40-42

1. ....  
.....  
2. ....  
.....  
3. ....  
.....

2. Taking each of the three changes in turn, please rate them on the following dimensions:

What was the **magnitude** of this change for your organisation (site)?

A

|          | 1<br>Very small          | 2<br>Small               | 3<br>Moderate            | 4<br>Big                 | 5<br>Very Big            |
|----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Change 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Change 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Change 3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

How **novel** (i.e. new and different) was this change for your organisation (site)?

40-41

|          | 1<br>Not at all novel    | 2<br>Not very novel      | 3<br>Moderately novel    | 4<br>Novel               | 5<br>Highly novel        |
|----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Change 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Change 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Change 3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

3. What percentage of your production workforce had to be retrained to use this different technology?

Enter percentage estimate

..... %

43 44-48

4. What proportion of the total production process uses this different technology?

*please tick the appropriate box*

Small ☒ 1      Most ☐ 3  
Moderate ☒ 2      All ☐ 4

5. Do you plan to introduce any changes in production technology in the **next two years**?

Yes ☐ ☒ 1      No ☒ 0

*If yes, please list the **three** most significant **planned** changes below:*

1. ....
2. ....
3. ....

6. Taking each of the **three planned** changes in turn, please rate them on the following dimensions:

What will be the **magnitude** of this planned change for your organisation (site)?

1      2      3      4      5  
Very small      Small      Moderate      Big      Very Big

|          |                          |                          |                          |                          |                          |
|----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Change 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Change 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Change 3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

How **novel** (i.e. new and different) for your organisation (site) will this planned change be?

1      2      3      4      5  
Not at all      Not very      Moderately      Novel      Highly  
novel      novel      novel

|          |                          |                          |                          |                          |                          |
|----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Change 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Change 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Change 3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

## Section C: Changes in production techniques/procedures

Such changes could include, for example, the introduction of new production processes, information scheduling & planning systems (e.g. MRP II), Just-In-Time management (JIT), or Total Quality Management (TQM).

1. In the last **two years** have you introduced changes (excluding technology) to production techniques or procedures?

Processes

57

Yes ☐

1

0

No ☐

if "no" go straight to question 5 overleaf (page 6)

If yes, please list the **three** most significant changes below:

1. ....
2. ....
3. ....

2. Taking each of the **three** changes in turn, please rate them on the following dimensions:

What was the **magnitude** of this change for your organisation (site)?

1 Very small      2 Small      3 Moderate      4 Big      5 Very Big

Change 1 ☐ ☐ ☐ ☐ ☐

Change 2 ☐ ☐ ☐ ☐ ☐

Change 3 ☐ ☐ ☐ ☐ ☐

How **novel** (i.e. new and different) was this change for your organisation (site)?

1 Not at all novel      2 Not very novel      3 Moderately novel      4 Novel      5 Highly novel

Change 1 ☐ ☐ ☐ ☐ ☐

Change 2 ☐ ☐ ☐ ☐ ☐

Change 3 ☐ ☐ ☐ ☐ ☐

3. What percentage of your production workers had to be retrained to work with these new production procedures?

Enter percentage estimate

..... %

4. What proportion of the overall production process uses these different procedures?

*please tick the appropriate box*

PROCC  
b7

Small

☐ 1

Most

☐ 3

Moderate

☐ 2

All

☐ 4

5. Do you plan to introduce any changes to production procedures in the next two years?

PROCEEDS

b8

Yes ☐ 1

No ☐ 0

FUTPRO

*If yes, please list the three most significant planned changes below:*

1. ....
2. ....
3. ....

6. Taking each of the **three planned** changes in turn, please rate them on the following dimensions:

What will be the **magnitude** of this planned change for your organisation (site)?

FMVFI  
b7

3

9-71

|          | Very small<br>1          | Small<br>2               | Moderate<br>3            | Big<br>4                 | Very Big<br>5            |
|----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Change 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Change 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Change 3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

How **novel** (i.e. new and different) for your organisation (site) will this planned change be?

FPNEV1

12-74

3

12-74

|          | Not at all<br>novel<br>1 | Not very<br>novel<br>2   | Moderately<br>novel<br>3 | Novel<br>4               | Highly<br>novel<br>5     |
|----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Change 1 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Change 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Change 3 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

## SECTION 1: BACKGROUND DETAILS

In order to help us analyse the data, it is important that we know some background information about you.

1. Name of company and site: comp RAUCHEN - SWINDON 037

2. Location of work site: CHENBY MANOR ESTATE, SWINDON WILTS 1

3. Age (Please tick the appropriate box)

|          |                                     |   |         |                          |   |   |       |
|----------|-------------------------------------|---|---------|--------------------------|---|---|-------|
| Under 20 | <input type="checkbox"/>            | 1 | 40-49   | <input type="checkbox"/> | 4 | 2 | age 1 |
| 20-29    | <input checked="" type="checkbox"/> | 2 | 50-59   | <input type="checkbox"/> | 5 |   |       |
| 30-39    | <input type="checkbox"/>            | 3 | Over 60 | <input type="checkbox"/> | 6 | 2 |       |

4. Sex (M or F) F sex 1

5. Please indicate your position in the organization:

a) **MANAGEMENT** ☐  
and  
b) Shopfloor ☐  
Office ☐  
Other (please specify) ☐

**NON-MANAGEMENT** ☐  
Shopfloor ☐  
Office ☒ 05  
Other (please specify) ☐

6. In which department do you work?

Materials Management dept 1 06

7. How long have you been in your current job?

01 yrs 02 mths 14 job 1

8. How long have you worked for this company?

11 yrs 04 mths cten 1

9. Do you work part-time 0 or full-time ✓?

pftime 1

0 0026

## SECTION 2

The following statements ask for your opinion of the work place in terms of how your work is organized and the practices within the company. For each statement, decide whether it is definitely true, mostly true, mostly false or definitely false, then tick the correct response. Below is an example to help you.

### EXAMPLE:

The statement below states that people are clear about the aims of the company.

If you believe this statement is mostly false then you would answer like this:

|   |                  |  |             |                 |
|---|------------------|--|-------------|-----------------|
| People are clear about the aims of the company. | Definitely false | <input checked="" type="checkbox"/> Mostly false | Mostly true | Definitely true |
|---|------------------|--|-------------|-----------------|

Please tick the response which best fits your opinion:

- |     |  |          |  |  |   |   |
|-----|--|----------|--|--|---|---|
| 1.  | In this organization, time is given to develop new ideas.                                  | min 1.1  | Definitely false                                     | <input checked="" type="checkbox"/> Mostly false | Mostly true                                     | <input checked="" type="checkbox"/> Definitely true |
| 2.  | People here always want to perform to the best of their ability.                           | eff 0.1  | Definitely false                                     | <input checked="" type="checkbox"/> Mostly false | Mostly true                                     | Definitely true                                     |
| 3.  | People are expected to do too much in a day.   | pres 1.1 | Definitely false                                     | <input checked="" type="checkbox"/> Mostly false | Mostly true                                     | Definitely true                                     |
| 4.  | People have a good understanding of what the organization is trying to do.                 | vis 1.1  | Definitely false                                     | Mostly false                                     | <input checked="" type="checkbox"/> Mostly true | Definitely true                                     |
| 5.  | Little time is spent on looking for new and improved ways of doing things in this company. | inn 1.1  | <input checked="" type="checkbox"/> Definitely false | Mostly false                                     | Mostly true                                     | Definitely true                                     |
| 6.  | This company is always working to achieve the highest standards of quality.                | qual 1.1 | Definitely false                                     | Mostly false                                     | <input checked="" type="checkbox"/> Mostly true | Definitely true                                     |
| 7.  | This company is quick to respond when changes need to be made.                             | flex 1.3 | Definitely false                                     | Mostly false                                     | <input checked="" type="checkbox"/> Mostly true | Definitely true                                     |
| 8.  | People here co-operate to help develop and apply new ideas.                                | inn 1.2  | Definitely false                                     | Mostly false                                     | <input checked="" type="checkbox"/> Mostly true | Definitely true                                     |
| 9.  | People are prepared to make a special effort to do a good job.                             | eff 1.7  | Definitely false                                     | <input checked="" type="checkbox"/> Mostly false | Mostly true                                     | Definitely true                                     |
| 10. | People usually receive feedback on the quality of work they have done.                     | perf 2   | <input checked="" type="checkbox"/> Definitely false | Mostly false                                     | Mostly true                                     | Definitely true                                     |
| 11. | People are enthusiastic about their work.  | eff 1.5  | Definitely false                                     | <input checked="" type="checkbox"/> Mostly false | Mostly true                                     | Definitely true                                     |

- |   |     |   |          |                  |              |             |                 |
|---|-----|---|----------|------------------|--------------|-------------|-----------------|
| R | 12. | People feel they don't know what the company goals are.                             | vis 1.2  | Definitely false | Mostly false | Mostly true | Definitely true |
| R | 13. | People are not that concerned with producing top quality work.                      | qual 1.4 | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 14. | Quick decisions and actions are characteristic of this place.                       | flex 1.2 | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 15. | The future direction of the company is clearly communicated to everyone.            | vis 1.4  | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 16. | People believe the company's success depends on high quality work.                  | qual 1.5 | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 17. | Work is well organized and planned so that jobs are done in the most efficient way. | eff 1.2  | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 18. | New ideas are readily accepted here.  | incl 1.2 | Definitely false | Mostly false | Mostly true | Definitely true |
| 2 | 19. | People can always rely on things being done in the same way around here.            | flex 1.6 | Definitely false | Mostly false | Mostly true | Definitely true |
| 2 | 20. | In general, people's workloads are not particularly demanding.                      | pres 1.2 | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 21. | Assistance in developing new ideas is readily available.                            | min 1.3  | Definitely false | Mostly false | Mostly true | Definitely true |
| 2 | 22. | People don't have any idea of how well they are doing their job.                    | perf 1.3 | Definitely false | Mostly false | Mostly true | Definitely true |
| R | 23. | Time and money could be saved if work were better organized.                        | eff 1.3  | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 24. | Changes in the way things are done here happen very slowly.                         | flex 1.4 | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 25. | Quality is taken very seriously here.   | qual 1.3 | Definitely false | Mostly false | Mostly true | Definitely true |
| 2 | 26. | People aren't clear about the aims of the company.                                  | vis 1.5  | Definitely false | Mostly false | Mostly true | Definitely true |
| R | 27. | People prefer to stick with what they know, rather than trying out a new approach.  | incl 1.4 | Definitely false | Mostly false | Mostly true | Definitely true |

|   |     |   |          |                  |              |             |                 |
|---|-----|---|----------|------------------|--------------|-------------|-----------------|
|   | 28. | People often put forward ideas and suggestions without expecting any extra reward.          | eff 1.8  | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 29. | People are strongly encouraged to come up with new and improved ways of doing things.       | inn 1.5  | Definitely false | Mostly false | Mostly true | Definitely true |
| R | 30. | People do not feel under pressure to work hard.   | pres 1.7 | Definitely false | Mostly false | Mostly true | Definitely true |
| R | 31. | Senior management like to keep to established, traditional ways of doing things.            | flex 1.5 | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 32. | People in this organization are always searching for new ways of looking at problems.       | inn 1.4  | Definitely false | Mostly false | Mostly true | Definitely true |
| R | 33. | This company does not have much of a reputation for top quality products.                   | qual 1.6 | Definitely false | Mostly false | Mostly true | Definitely true |
| R | 34. | In general, it is hard for someone to measure the quality of their performance.             | perf 1.4 | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 35. | Management require people to work extremely hard.   | pres 1.4 | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 36. | Everyone who works here is well aware of the long term plans and direction of this company. | vis 1.8  | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 37. | This organization provides practical support for new ideas and their application.           | inn 1.5  | Definitely false | Mostly false | Mostly true | Definitely true |
| R | 38. | Poor scheduling and planning often results in targets not being met.                        | eff 1.6  | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 39. | Management here are quick to spot the need to do things differently.                        | flex 1.8 | Definitely false | Mostly false | Mostly true | Definitely true |
| R | 40. | People here don't put more effort into their work than they have to.                        | eff 1.9  | Definitely false | Mostly false | Mostly true | Definitely true |
| R | 41. | People here believe that quality is not really their responsibility.                        | qual 1.7 | Definitely false | Mostly false | Mostly true | Definitely true |
| R | 42. | The pace of work here is pretty relaxed.  | pres 1.9 | Definitely false | Mostly false | Mostly true | Definitely true |

- |   |     |   |           |                  |              |             |                 |
|---|-----|---|-----------|------------------|--------------|-------------|-----------------|
| R | 43. | Things could be done much more efficiently if people stopped to think.  | effi 1.5  | Definitely false | Mostly false | Mostly true | Definitely true |
| R | 44. | People here get by with doing as little as possible.  | effo 1.6  | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 45. | People's performance is measured on a regular basis.  | perf 1.6  | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 46. | Management organize things here for maximum productivity.   | effi 1.8  | Definitely false | Mostly false | Mostly true | Definitely true |
| R | 47. | The way this organization does things has never changed very much.  | flex 1.11 | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 48. | Jobs here allow people to measure their own performance.  | perf 1.7  | Definitely false | Mostly false | Mostly true | Definitely true |
| R | 49. | Productivity could be improved if jobs were organized and planned better.   | effi 1.9  | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 50. | There is a strong sense of where the company is going.  | vis 1.9   | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 51. | People here provide and share resources to help in the application of new ideas.  | inn 1.6   | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 52. | People here are under pressure to meet targets.   | pres 1.5  | Definitely false | Mostly false | Mostly true | Definitely true |
| R | 53. | Management are not interested in trying out new ideas.  | inn 1.7   | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 54. | This organization is very flexible; it can quickly change procedures to meet new conditions and solve problems as they arise. | flex 1.12 | Definitely false | Mostly false | Mostly true | Definitely true |
| R | 55. | The way people do their jobs is rarely assessed.  | perf 1.8  | Definitely false | Mostly false | Mostly true | Definitely true |
|   | 56. | There is a lot of support for new ideas here.   | inn 1.8   | Definitely false | Mostly false | Mostly true | Definitely true |

## SECTION 3A

Section 3A considers the relationships between people at work, how they co-operate and communicate. In addition, how people feel others relate to them.

### EXAMPLE:

The statement below asks whether people aren't valued here. If you think this is definitely true, then you would answer like this:

|                            |                             |                         |                        |                            |
|----------------------------|-----------------------------|-------------------------|------------------------|----------------------------|
| People aren't valued here. | <i>Definitely<br/>false</i> | <i>Mostly<br/>false</i> | <i>Mostly<br/>true</i> | <i>Definitely<br/>true</i> |
|----------------------------|-----------------------------|-------------------------|------------------------|----------------------------|

Please tick the response which best fits your opinion:

- |  | <i>Definitely<br/>false</i>         | <i>Mostly<br/>false</i>             | <i>Mostly<br/>true</i>              | <i>Definitely<br/>true</i>          |
|--|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Management involve people when decisions are made that affect them. <span style="float: right; margin-right: 20px;"><i>dec 1.1</i></span>                                     | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2. People can carry out their work in the way they think best. <span style="float: right; margin-right: 20px;"><i>auto 1.12</i></span>   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 3. Information is widely shared. <span style="float: right; margin-right: 20px;"><i>comm 1.1</i></span>  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| R 4. People aren't valued here. <span style="float: right; margin-right: 20px;"><i>well 1.1</i></span>   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Supervisors here are really good at understanding people's problems. <span style="float: right; margin-right: 20px;"><i>supe 1.1</i></span>                                   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| R 6. People are talked to about small things, but the things that really matter are decided from the top. <span style="float: right; margin-right: 20px;"><i>dec 1.10</i></span> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 7. Managers encourage people to take on more responsibility in their work. <span style="float: right; margin-right: 20px;"><i>auto 1.13</i></span>                               | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| R 8. People are not kept well informed. <span style="float: right; margin-right: 20px;"><i>comm 1.2</i></span>   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 9. People's skills are developed so that they can do new jobs. <span style="float: right; margin-right: 20px;"><i>train 1.1</i></span>   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10. Supervisors show that they have confidence in those they manage. <span style="float: right; margin-right: 20px;"><i>supe 1.2</i></span>                                      | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 11. People feel they can influence decisions that concern them. <span style="float: right; margin-right: 20px;"><i>dec 1.3</i></span>  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 12. This company strongly believes in the importance of training. <span style="float: right; margin-right: 20px;"><i>train 1.2</i></span>  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |

|     |  |           |                  |              |             |                 |
|-----|--|-----------|------------------|--------------|-------------|-----------------|
| 13. | This company pays little attention to the interests of employees.                | well 1.2  | Definitely false | Mostly false | Mostly true | Definitely true |
| 14. | People work well together here.  | coop 1.11 | Definitely false | Mostly false | Mostly true | Definitely true |
| 15. | People are given adequate scope to do their jobs properly.                       | auto 1.2  | Definitely false | Mostly false | Mostly true | Definitely true |
| 16. | People are not properly trained when there is a new machine or bit of equipment. | train 1.3 | Definitely false | Mostly false | Mostly true | Definitely true |
| 17. | Communication is not a problem in this company.                                  | comm 1.3  | Definitely false | Mostly false | Mostly true | Definitely true |
| 18. | There always seem to be a lot of quarrels going on here.                         | coop 1.4  | Definitely false | Mostly false | Mostly true | Definitely true |
| 19. | Supervisors here are friendly and easy to approach.                              | supe 1.8  | Definitely false | Mostly false | Mostly true | Definitely true |
| 20. | Relations between people here are generally good.                                | coop 1.12 | Definitely false | Mostly false | Mostly true | Definitely true |
| 21. | This company is considerate towards its employees.                               | well 1.3  | Definitely false | Mostly false | Mostly true | Definitely true |
| 22. | Important information is often not communicated to people.                       | comm 1.3  | Definitely false | Mostly false | Mostly true | Definitely true |
| 23. | It's not necessary to follow procedures to the letter around here.               | form 1.7  | Definitely false | Mostly false | Mostly true | Definitely true |
| 24. | Management let people make their own decisions much of the time.                 | auto 1.5  | Definitely false | Mostly false | Mostly true | Definitely true |
| 25. | There are a lot of petty rivalries around here.                                  | coop 1.2  | Definitely false | Mostly false | Mostly true | Definitely true |
| 26. | People are strongly encouraged to develop their skills.                          | train 1.8 | Definitely false | Mostly false | Mostly true | Definitely true |
| 27. | This company tries to look after its employees.                                  | well 1.4  | Definitely false | Mostly false | Mostly true | Definitely true |
| 28. | Changes are made without talking to the people involved in them.                 | dec 1.4   | Definitely false | Mostly false | Mostly true | Definitely true |
| 29. | Everything has to be done according to the book                                  | form 1.4  | Definitely false | Mostly false | Mostly true | Definitely true |

|       |  |           |                             |                         |                        |                            |
|-------|--|-----------|-----------------------------|-------------------------|------------------------|----------------------------|
| 30.   | People can quickly get hold of information when they need it.                | comm 1.5  | Definitely false            | Mostly false            | Mostly <del>true</del> | Definitely true            |
| 31.   | People can rely on others to help out when they are overloaded with work.    | coop 1.3  | Definitely false            | Mostly <del>false</del> | Mostly true            | Definitely true            |
| R 32. | It's important to check things first with the boss before taking a decision. | auto 1.11 | Definitely false            | Mostly false            | Mostly <del>true</del> | Definitely true            |
| 33.   | People receive enough training when it comes to using new equipment.         | train 1.7 | Definitely false            | Mostly <del>false</del> | Mostly true            | Definitely true            |
| 34.   | This company cares about its employees.                                      | well 1.5  | Definitely false            | Mostly false            | Mostly true            | Definitely <del>true</del> |
| 35.   | People feel decisions are frequently made over their heads.                  | dec 1.6   | Definitely false            | Mostly false            | Mostly true            | Definitely <del>true</del> |
| 36.   | There are often breakdowns in communication here.                            | comm 1.6  | Definitely false            | Mostly false            | Mostly true            | Definitely <del>true</del> |
| 37.   | People at the top tightly control the work of those below them.              | auto 1.9  | Definitely <del>false</del> | Mostly false            | Mostly true            | Definitely true            |
| 38.   | Conflict between people here prevents the job getting done.                  | coop 1.6  | Definitely false            | Mostly false            | Mostly true            | Definitely <del>true</del> |
| 39.   | People don't have any say in decisions which affect their work.              | dec 1.5   | Definitely false            | Mostly false            | Mostly <del>true</del> | Definitely true            |
| 40.   | Employee welfare is not taken seriously around here.                         | well 1.6  | Definitely <del>false</del> | Mostly false            | Mostly true            | Definitely true            |
| 41.   | Nobody gets too upset if people break the rules around here.                 | form 1.9  | Definitely false            | Mostly false            | Mostly true            | Definitely <del>true</del> |
| 42.   | Management keep too tight a reign on the way things are done around here.    | auto 1.10 | Definitely <del>false</del> | Mostly false            | Mostly true            | Definitely true            |
| 43.   | Supervisors here don't understand what makes their subordinates tick.        | super 1.5 | Definitely false            | Mostly false            | Mostly true            | Definitely <del>true</del> |
| 44.   | Channels of communication work effectively.                                  | comm 1.7  | Definitely false            | Mostly <del>false</del> | Mostly true            | Definitely true            |

- |     |  |                   |                             |                         |                        |                            |
|-----|--|-------------------|-----------------------------|-------------------------|------------------------|----------------------------|
| 45. | It is considered extremely important here to follow the rules.                           | <u>form 1.2</u>   | <del>Definitely false</del> | Mostly false            | Mostly true            | Definitely true            |
| 46. | Around here, it's everyone for themselves.   | <u>coop 1.13</u>  | Definitely false            | Mostly false            | Mostly true            | <del>Definitely true</del> |
| 47. | Supervisors can be relied upon to give good guidance to people.                          | <u>sup 1.6</u>    | Definitely false            | Mostly false            | <del>Mostly true</del> | Definitely true            |
| 48. | This company tries to be fair in its actions towards employees.                          | <u>well 1.7</u>   | Definitely false            | <del>Mostly false</del> | Mostly true            | Definitely true            |
| 49. | Supervisors show an understanding of the people who work for them.                       | <u>sup 1.7</u>    | Definitely false            | Mostly false            | <del>Mostly true</del> | Definitely true            |
| 50. | Poor communication is common here.   | <u>comm 1.8</u>   | Definitely false            | <del>Mostly false</del> | Mostly true            | Definitely true            |
| 51. | The company only gives people the minimum amount of training they need to do their job.  | <u>train 1.10</u> | Definitely false            | Mostly false            | Mostly true            | <del>Definitely true</del> |
| 52. | People can ignore formal procedures and rules if it helps get the job done.              | <u>form 1.3</u>   | Definitely false            | Mostly false            | <del>Mostly true</del> | Definitely true            |
| 53. | Management trust people to take work-related decisions without getting permission first. | <u>auto 1.7</u>   | Definitely false            | <del>Mostly false</del> | Mostly true            | Definitely true            |
| 54. | People co-operate with each other.   | <u>coop 1.14</u>  | Definitely false            | <del>Mostly false</del> | Mostly true            | Definitely true            |
| 55. | People don't pay much attention to rules and regulations.                                | <u>form 1.10</u>  | Definitely false            | Mostly false            | Mostly true            | <del>Definitely true</del> |

### SECTION 3B

The following questions relate to the organization's business strategy and other management issues. These questions are specifically relevant to those in managerial positions. However, if you feel you wish to fill this section in, then please do so.

IF YOU ARE NOT COMPLETING THIS SECTION PLEASE TURN TO SECTION 4 ON PAGE 13

Please tick the response which best fits your opinion:

- |   |     |   |                         |                     |                    |                        |
|---|-----|---|-------------------------|---------------------|--------------------|------------------------|
| R | 1.  | Organizational strategies are rarely changed.<br><i>ref 1.1</i>   | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
| R | 2.  | People are suspicious of other departments.<br><i>info 1.1</i>  | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
|   | 3.  | This organization has a tendency towards high risk, high return projects.<br><i>risk 1.1</i>  | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
|   | 4.  | In this organization the way people work together is readily changed in order to improve performance.<br><i>ref 1.2</i>             | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
|   | 5.  | This organization makes a concerted effort to create market opportunities.<br><i>out 1.3</i>  | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
|   | 6.  | There is very little conflict between departments here.<br><i>info 1.3</i>  | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
| R | 7.  | This organization is quite inward looking; it does not concern itself with what is happening in the market place.<br><i>out 1.5</i> | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
|   | 8.  | Entrepreneurship and risk-taking are encouraged here.<br><i>risk 1.2</i>  | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
|   | 9.  | People in different departments are prepared to share information.<br><i>intel 1.2</i>  | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
| R | 10. | Ways of improving service to the customer are not given much thought.<br><i>cust 1.2</i>  | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
|   | 11. | The methods used by this organization to get the job done are often discussed.<br><i>ref 1.3</i>                                    | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
| R | 12. | Taking risks is regarded in a negative light here.<br><i>risk 1.4</i>   | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
| R | 13. | Customer needs are not considered top priority here.<br><i>cust 1.9</i>   | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
| R | 14. | People in other departments tend to be secretive about what they are doing.<br><i>info 1.6</i>                                      | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |

|     |   |                         |                     |                    |                        |
|-----|---|-------------------------|---------------------|--------------------|------------------------|
| 15. | People are encouraged to take quite big risks when opportunities arise.   | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
| 16. | Collaboration between departments is very effective. <i>risk 1.5</i><br><i>note 1.8</i>                                 | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
| 17. | There are regular discussions as to whether people in the organization are working effectively together. <i>ref 1.4</i> | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
| 18. | This company is slow to respond to the needs of the customer. <i>cust 1.7</i>   | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
| 19. | This organization often takes risks to get ahead of the competition. <i>risk 1.8</i>                                    | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
| 20. | In this organization objectives are modified in light of changing circumstances. <i>ref 1.5</i>                         | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
| 21. | There is very little respect between some of the departments here. <i>note 1.12</i>                                     | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
| 22. | This company is continually looking for new opportunities in the market place. <i>note 1.1</i>                          | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
| 23. | This organization takes risks in the decisions it makes. <i>risk 1.12</i>   | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |
| 24. | In this organization time is taken to review organizational objectives. <i>ref 1.6</i>                                  | <i>Definitely false</i> | <i>Mostly false</i> | <i>Mostly true</i> | <i>Definitely true</i> |

0 0026

## SECTION 4

The following questions are about how *you* feel about working in this company. Below is an example to illustrate.

### EXAMPLE:

The statement asks to what extent you agree with the statement. If you strongly agree then you would answer like this:

To what extent do you agree with the following statement?

|   | <i>Strongly<br/>Disagree</i> | <i>Disagree</i> | <i>Not Sure</i> | <i>Agree</i> | <i>Strongly<br/>Agree</i>           |
|---|------------------------------|-----------------|-----------------|--------------|-------------------------------------|
| I feel myself to a be part of this company. | [ ]                          | [ ]             | [ ]             | [ ]          | <input checked="" type="checkbox"/> |

To what extent do you agree with each of the following statements?

|   | <i>Strongly<br/>Disagree</i>        | <i>Disagree</i>                     | <i>Not Sure</i>                     | <i>Agree</i>                        | <i>Strongly<br/>Agree</i> |
|---|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|---------------------------|
| 1. <i>org c 1.1</i><br>I am quite proud to be able to tell people who it is I work for.   | [ ]                                 | [ ]                                 | [ ]                                 | <input checked="" type="checkbox"/> | [ ]                       |
| 4 2. <i>org c 1.4</i><br>Even if the company were not doing well financially, I would be reluctant to change to another employer. | [ ]                                 | [ ]                                 | <input checked="" type="checkbox"/> | [ ]                                 | [ ]                       |
| 2 3. <i>org c 1.2</i><br>I sometimes feel like leaving this job for good.   | [ ]                                 | [ ]                                 | [ ]                                 | <input checked="" type="checkbox"/> | [ ]                       |
| 3 4. <i>org c 1.3</i><br>I'm not willing to put myself out just to help the organization.   | <input checked="" type="checkbox"/> | [ ]                                 | [ ]                                 | [ ]                                 | [ ]                       |
| 5. I feel myself to be a part of this company.  | [ ]                                 | [ ]                                 | <input checked="" type="checkbox"/> | [ ]                                 | [ ]                       |
| 6. In my work I like to feel I am making some effort not just for myself, but for the company as well.                            | [ ]                                 | [ ]                                 | [ ]                                 | <input checked="" type="checkbox"/> | [ ]                       |
| 7. The offer of a bit more money with another employer would not seriously make me think of changing my job.                      | [ ]                                 | [ ]                                 | [ ]                                 | <input checked="" type="checkbox"/> | [ ]                       |
| 8. I would not recommend a close friend to join this company.   | [ ]                                 | <input checked="" type="checkbox"/> | [ ]                                 | [ ]                                 | [ ]                       |
| 9. It pleases me to know that my own work has made a contribution to the good of the company.                                     | [ ]                                 | [ ]                                 | [ ]                                 | <input checked="" type="checkbox"/> | [ ]                       |

The following statements describe the features of your job. Please tick the answer which best describes how satisfied you are with each feature.

|  | <i>Extremely<br/>dissat-<br/>isfied</i> | <i>Very<br/>dissat-<br/>isfied</i>  | <i>Moderately<br/>dissat-<br/>isfied</i> | <i>Not<br/>sure</i>                 | <i>Moderately<br/>satisfied</i>     | <i>Very<br/>satisfied</i>           | <i>Extremely<br/>satisfied</i>      |
|--|---|-------------------------------------|--|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. The physical working conditions.                                  | <input type="checkbox"/>                | <input type="checkbox"/>            | <input checked="" type="checkbox"/>      | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2. The freedom to choose your own method of working.                 | <input type="checkbox"/>                | <input type="checkbox"/>            | <input type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 3. Your fellow team members.   | <input type="checkbox"/>                | <input type="checkbox"/>            | <input type="checkbox"/>                 | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4. The recognition you get for good work.                            | <input type="checkbox"/>                | <input checked="" type="checkbox"/> | <input type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5. Your immediate boss.  | <input type="checkbox"/>                | <input type="checkbox"/>            | <input type="checkbox"/>                 | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6. The amount of responsibility you are given.                       | <input type="checkbox"/>                | <input type="checkbox"/>            | <input type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 7. Your rate of pay.   | <input type="checkbox"/>                | <input type="checkbox"/>            | <input checked="" type="checkbox"/>      | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 8. The opportunity to use your ability.                              | <input type="checkbox"/>                | <input type="checkbox"/>            | <input type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 9. Relationships between management and workers in the organization. | <input type="checkbox"/>                | <input checked="" type="checkbox"/> | <input type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 10. Your chance of promotion or progression within the company.      | <input type="checkbox"/>                | <input type="checkbox"/>            | <input type="checkbox"/>                 | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 11. The way your firm is managed.                                    | <input type="checkbox"/>                | <input type="checkbox"/>            | <input type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 12. The attention paid to suggestions you make.                      | <input type="checkbox"/>                | <input type="checkbox"/>            | <input type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 13. Your hours of work.  | <input type="checkbox"/>                | <input type="checkbox"/>            | <input type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 14. The amount of variety in your job.                               | <input type="checkbox"/>                | <input type="checkbox"/>            | <input type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
|  | <input type="checkbox"/>                | <input type="checkbox"/>            | <input type="checkbox"/>                 | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |

Below are some questions which deal with your **health in general** and in particular the amount of anxiety you may have felt within the **past month**. Please tick the answer which most nearly applies to you.

Have you recently: *ghv 1.1-1.12*

|   | <i>0</i>                  | <i>1</i>                  | <i>2</i>                      | <i>3</i>                    |
|---|---------------------------|---------------------------|-------------------------------|-----------------------------|
| 1. Been able to concentrate on whatever you're doing?     | <i>better than usual</i>  | <i>same as usual</i>      | <i>less than usual</i>        | <i>much less than usual</i> |
| 2. Lost much sleep over worry?                            | <i>not at all</i>         | <i>no more than usual</i> | <i>rather more than usual</i> | <i>much more than usual</i> |
| 3. Felt that you are playing a useful part in things?     | <i>more so than usual</i> | <i>same as usual</i>      | <i>less than usual</i>        | <i>much less than usual</i> |
| 4. Felt capable of making decisions about things?         | <i>more so than usual</i> | <i>same as usual</i>      | <i>less than usual</i>        | <i>much less than usual</i> |
| 5. Felt constantly under strain?                          | <i>not at all</i>         | <i>no more than usual</i> | <i>rather more than usual</i> | <i>much more than usual</i> |
| 6. Felt that you couldn't overcome your difficulties?     | <i>not at all</i>         | <i>no more than usual</i> | <i>rather more than usual</i> | <i>much more than usual</i> |
| 7. Been able to enjoy your normal day-to-day activities?  | <i>more so than usual</i> | <i>same as usual</i>      | <i>less than usual</i>        | <i>much less than usual</i> |
| 8. Been able to face up to your problems?                 | <i>more so than usual</i> | <i>same as usual</i>      | <i>less able than usual</i>   | <i>much less able</i>       |
| 9. Been feeling unhappy or depressed?                     | <i>not at all</i>         | <i>no more than usual</i> | <i>rather more than usual</i> | <i>much more than usual</i> |
| 10. Been losing confidence in yourself?                   | <i>not at all</i>         | <i>no more than usual</i> | <i>rather more than usual</i> | <i>much more than usual</i> |
| 11. Been thinking of yourself as a worthless person?      | <i>not at all</i>         | <i>no more than usual</i> | <i>rather more than usual</i> | <i>much more than usual</i> |
| 12. Been feeling reasonably happy, all things considered? | <i>more so than usual</i> | <i>same as usual</i>      | <i>less so than usual</i>     | <i>much less than usual</i> |

Please place the questionnaire in the envelope provided.

Thank you for participating.

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It is possible that completing this questionnaire may draw your attention to problems which you are experiencing as a result of work. If you are worried that these are serious we would advise you to contact your GP.

CODING

A=1  
B=2  
C=3  
D=4

Date..... Rater 1-1..... Rater..... Co. I.D. no..... 2-6.....

Line 4 = DS  
Line 5 = MW  
Line 6 = MP

## Innovation Ratings

I, Please rate each section for innovation on a scale from 1 to 7

### SECTION A - CHANGES IN PRODUCTS

ds prod  
rate prod  
products  
7-7

not at all  
innovative

extremely  
innovative

A SCALE  
RATE PROD

1 2 3 4 5 6 7

### SECTION B - CHANGES IN PRODUCTION TECHNOLOGY

a. tech  
rate tech  
prod tech  
8-8

not at all  
innovative

extremely  
innovative

B SCALE /  
RATE TEC

1 2 3 4 5 6 7

### SECTION C - CHANGES IN PRODUCTION TECHNIQUES/ PROCEDURES

ds prod  
rate prod  
prod prod  
9-9

not at all  
innovative

extremely  
innovative

C SCALE /  
RATE PROC

1 2 3 4 5 6 7

### SECTION D - CHANGES IN WORK ORGANISATION

ds work  
rate work  
work org  
10-10

not at all  
innovative

extremely  
innovative

D SCALE  
RATE WORK

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### SECTION E - CHANGES IN HUMAN RESOURCE MANAGEMENT

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extremely  
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E SCALE  
RATE HR

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Wolverhampton Business School  
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June 2002

Dear

Interviews: organizational learning mechanisms and innovation

As you are aware, a research exercise will be taking place at Ricoh for two weeks commencing on 17<sup>th</sup> June 2002. The purpose of this part of the exercise is two-fold:

1. To consider the nature of your involvement in creating and enacting innovation and change, with reference to one or two specific examples.
2. To reflect upon any practices which, in your view, have been or will be significant in developing your skills in order to enact innovation and change effectively (such as visits to customers, carrying out project work etc.).

With the above objectives in mind, it would be valuable if you could consider any innovations/ changes with which you have been involved in readiness for the interview, and also any thoughts that you may have about what people management practices may support the effective enactment of such change. For your guidance, I attach part of the questionnaire which will be discussed in more detail at the interview.

Thank you for your support for this exercise. All individual responses will be confidential. General feedback on findings and conclusions will be provided as soon as possible after the research exercise has been completed. Please do not hesitate to contact me on the above number if you would like to discuss any aspect of this letter in more detail. I look forward to meeting you.

Yours sincerely

Helen Shipton  
Senior Lecturer  
Wolverhampton Business School

Proposed interview structure:

Please identify and give details of one or two innovations- i.e. new and improved ways of operating- with which you have been directly involved at Ricoh (Telford). You may wish to consider innovations in products, in manufacturing systems or in manufacturing machine-related technology.

Innovations in products are those changes which impact directly on your product operation. Please estimate the impact and significance of any innovations in products *with which you have been directly involved* by assessing the proportion of manufacturing workers who have been involved with the innovation and the % of sales turnover accounted for in this way.

Innovations in manufacturing machine-related technology may involve the introduction of new equipment such as robotics, self-feeding machines and changes in the management of electronic data collection and testing methods. Innovations in manufacturing systems could include the introduction of new information scheduling and planning systems, just-in-time management or the introduction of data warehouse and/ or electronic business systems.


Again, please estimate the impact and significance of any innovations in products *with which you have been directly involved* by assessing the proportion of production workers who have been involved with the innovation and the % of sales turnover accounted for in this way.

### ORGANIZATIONAL LEARNING MECHANISMS

With reference to the above, please select one or two particularly significant innovations in products, manufacturing machine-related technology or manufacturing systems *in terms of your own career development and learning*.

With reference to the innovations/changes that you have selected, what learning/developmental experiences had you experienced in order to prepare you for enacting them?

To what extent did you have the opportunity to:-

 Learn from internal sources, for example through:-

discussion of long-term career development plans?

secondment to other departments?

Providing appropriate recognition for the effective development of more junior members of staff.

Not taking punitive action if any ideas fail to work out as planned

Any other relevant points

Are there any other mechanisms/practices which the organization could have introduced to enable you to deal more effectively with requirements for change and innovation?

having a mentor or coach? (or acting as a mentor or coach)

experiencing training/ development within the company which took you outside the constraints of your immediate job?

Any other internal sources of learning?.....

2

Learn from the external sources, for example, through:-

Visiting/ benchmarking the activities of customers and suppliers

Learning from development activities not directly work-related (outside the company)

Any other external sources of learning?

3

Mechanisms facilitating the transfer and storage of best practice/ solutions to problems

To what extent was your learning enabled through being aware of best practice/ solutions to problems elsewhere in the organization?

How did you become aware of such best practice/ solutions to problems existing elsewhere?

Is there any systematic way of recording such insights in your company? If so, describe the ways in which this was helpful to you in relation to the particular innovation being considered.

4

Factors constraining or enabling learning

Again, considering one or two innovations with which you have been directly involved, to what extent do you believe that the company is supportive of your learning? Consider with reference to the following points:

Providing direction for learning (i.e. making explicit the importance of learning and development, in any mission or vision statements, considering learning as a priority in performance appraisal).

Providing formal and/ or informal training in team-working and communication skills

Providing training in giving and receiving feedback

## Organizational Learning and Innovation at RPL

Research Exercise conducted by  
Helen Shipton  
Senior Lecturer  
Wolverhampton Business School  
August 2002

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## Research question:-



Q To what extent do organizational learning mechanisms (e.g. training and development practices) predict innovation and why?

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## Research methods

- Q In-depth interviews with:-
- Q Technical experts from PPC, Toner and OPC: to gauge levels of innovation
- Q Identified 'high performers' within Toner, OPC and Business Support: to discuss sources of learning
- Q A range of managers to gain overview
- Q Employee focus groups

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### How innovative is RPL?

- 2 Considered the magnitude, the novelty and the number of people who had to be re-trained to enact the innovation
- 2 Key innovations: 'build-to-order' technology and work design, cellular working, new Toner filling system, production of digital drums within OPC
- 2 Based on evidence I saw, I don't think the company is outstandingly innovative

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### Findings: 3 themes identified:-

- 2 Learning generated internally, e.g. on-job learning, internal training activities
- 2 Learning generated through exposure to external influences, such as customers
- 2 Learning engendered through people being part of a 'community of practice.'

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### Learning generated internally

- 2 The apprentice scheme: highly valued: however 'once you come to the end of it, you tend to fall off the edge'?
- 2 World class team leader scheme: *perceived* loss of momentum
- 2 Role of Japanese technical advisors
- 2 Projects, secondments, involvement with the innovation itself

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### **Learning generated through exposure to external influences**

- ❑ Only a minority indicated that they had links with stakeholders outside the organization
- ❑ Some raised the importance of links with other parts of the Ricoh Group
- ❑ D.T.I. Initiatives were mentioned
- ❑ Involvement with Midlands Excellence
- ❑ Formal qualifications

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### **Learning engendered being part of a 'community of practice'.**

- ❑ Innovations were not the result of individual intuition alone
- ❑ The importance of interaction was alluded to- being open, sharing ideas
- ❑ Culture at RPL was perceived to be good for this; at times 'this is a bit detrimental...we should be learning and reflecting more on what went wrong and why.'

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### **Other points emerging:-**

- ❑ The performance review process is not seen to be a developmental experience
- ❑ Individuals perceive that there is a lack of clarity about what constitutes 'good performance'
- ❑ There is a perception that formal, professional qualifications are not as highly valued as direct, shop-floor experience

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### Conclusions:-

- 2 Producing innovation requires exposure to new experiences- both from within the organization and outside- to challenge existing thinking
- 2 It requires individuals to manifest strong team skills- in order to develop dialogue and to result in a sharing of knowledge
- 2 A focus on providing VARIETY and DEVELOPING SKILLS is needed

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### Conclusions:-

- 2 RPL needs to develop a more structured approach to people management
- 2 Includes consideration of development strategy, bringing together formal and informal learning opportunities
- 2 Includes rewarding people for learning and for supporting the learning of others

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### Conclusions:



- 2 The organization needs to consider how to develop team skills
- 2 This is important to ensure that individual learning is shared, increasing overall capacity to innovate.

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