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Mark Steven Jenner B.A. (Hons.), M.A., M.I.P.D.

OPEN UNIVERSITY

**DESIGNING HIGH PERFORMANCE TEAMS FOR PROJECTS:
A STUDY OF 49 PROJECT TEAMS IN THE UK CONSTRUCTION INDUSTRY**

Submitted in fulfilment of the award of:

Doctor of Philosophy

in the discipline of:

Human Resource Management

Author no. M7104030

Date of submission: 30th September 1996

Date of award: 15th September 1997

October 1997

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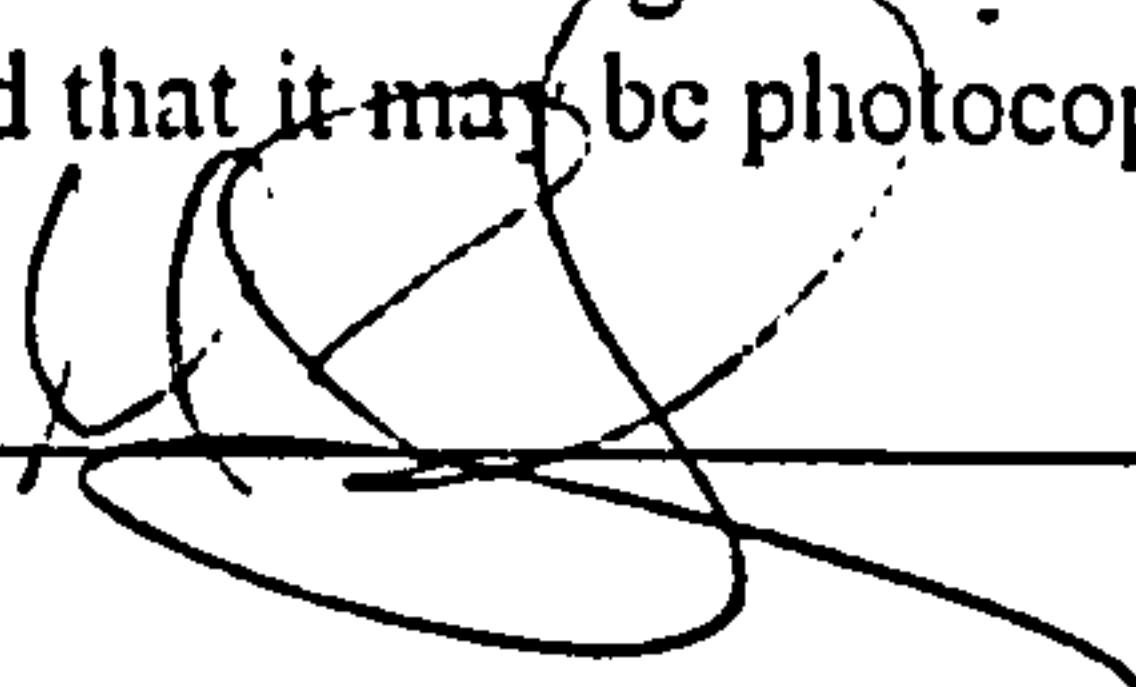
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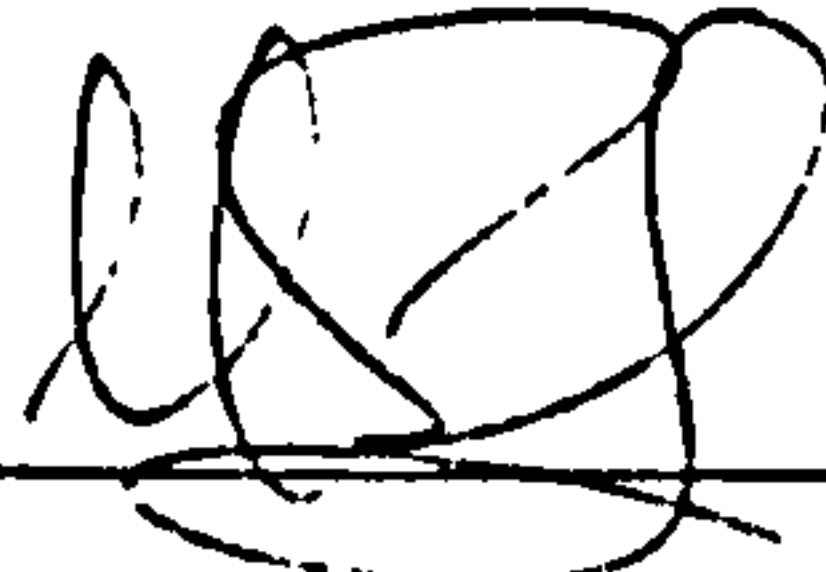
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THESIS ABSTRACT

Teams have been presented as a panacea to complex and turbulent business environments, but there are few examples of genuinely high-performing teams. This study considers the utility of work design as a means of improving the performance of project teams and thereby resolving this paradox. Grounded in quantitative methodology, and supported by relevant qualitative data, this study has used a single case experiment to examine the effects of multiple work design variables on the climate and performance of 49 construction project management teams. The single case environment provided an opportunity to study a large number of real work groups, executing broadly similar tasks, while controlling for the effects of organisational culture on social and work behaviour.

The results indicated that three levels of intervention - transformational leadership, team organisation and team performance orientation - were influential in either (a) directly influencing project team performance or (b) creating a team climate which was itself predictive of desired outcomes, specifically the moderation of project complexity and higher levels of productivity. In particular, the results showed that the 'inspiring a shared vision' leader practice was influential in explaining the perceived satisfaction of customers with project team performance. This provides empirical evidence that visionary leadership is an important determinant of high performance in complex, fluid and uncertain work environments, such as construction project management.

Although task orientation and shared vision emerged as reasonably strong performance norms in the sample, it is generally difficult isolating the referent group norm(s) which explain(s) the variation in the performance of project teams working in myriad social, temporal and task conditions. Rather than attempting to manage group behaviour in real-time, therefore, the results of this study suggest that a coherent and integrated package of work design interventions can leverage exceptional value from project teams by helping each team to develop unique performance and behavioural strategies.

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Acknowledgements

It may seem strange that a study of teams has been carried out by a solitary individual, but this is the nature of Doctoral research. Nevertheless, during the time that I have been working on this project I have spoken to, and been influenced by, many people and, whilst this does not constitute the form of team working examined in this study, it does demonstrate that complex tasks are seldom accomplished in isolation. I would like to recognise some of these people in this section but, as always, the accuracy of the data and the soundness of the conclusions are the sole responsibility of the author.

The people that I would like to thank fall in to several different groups. The first group are my work colleagues at Conorg. Although I am now an ex-employee of Conorg, I fully appreciate that this project could not have been completed without the full and unconditional support of senior management, team leaders and team members in the company. Indeed, if there is anything that differentiates this research from other similar single case experiments, it is the level of access that I was granted and the opportunity to 'test' the results against my own experience. I would particularly like to thank Jim, Mike, Derek, Cliff and John.

The second group of people to thank are the external consultants who worked with me in Conorg and who were willing to listen to my ideas and share their own experiences, particularly of the change processes within the Company which provide the context to the study. Gregor Hunter, Val and Peter Lowman and Neville Webb are the four significant individuals in this group.

A third group comprises the academics and fellow researchers who found time to reply to my exploratory letters and telephone calls and often to meet with me. These include

Dr David Wyatt (Brighton), Professor David Buchanan (Loughborough), Dr David Boddy (Glasgow), Dr Andrea Taylor-Cummings (Andersen Consulting), Kim Clark and David Ellison (both of Harvard), Erin Lehman (Harvard), Professor Andrew Pettigrew (Warwick), Dr Dian-Marie Hosking (Aston) and Dr Peter Clark (Aston).

The fourth group contributed directly to the research study by giving permission to reproduce their various questionnaire instruments. I would like to thank Dr Barry Posner of Kouzes Posner International and Pfeiffer & Company for permission to reproduce the Leadership Practices Inventory (LPI); Dr Neil Anderson and ASE, a division of NFER-NELSON, for permission to reproduce the Team Climate Inventory (TCI); Professor J. Richard Hackman for permission to reproduce items from the Job Diagnostic Survey, Flight Crew and Symphony Orchestra Questionnaires; and Charles Keeling and Price Waterhouse for permission to reproduce items from their Client Satisfaction Questionnaire.

The final three people that I would like to recognise do not comprise a group, but their individual contributions were most important to me. The first is Trevor Lambert, a statistician, whose initial training of me in the use of quantitative techniques and subsequent on-going advice helped overcome my reticence in using and interpreting statistics.

The second person to thank is Dr Christopher Mabey, my supervisor at the Open University's School of Management. Chris possesses all of the best characteristics of a supervisor, but his commitment to my project, his quick and incisive feedback on draft work of varying length and quality, and his continuing efforts to get me to locate my work design interest within a wider HRM context were especially valuable.

Whilst this project may have started it certainly would never have been finished without the support and patience of my wife, Michele. She helped me find time and space to study and write in a life already dominated by work and, latterly, by Craig. The final work is therefore dedicated to her.

1.0. INTRODUCTION

This study of 49 project teams in the construction industry during the early 1990s is concerned with isolating the conditions that can enhance project team performance. In this respect the study is a response to calls in the Human Resource Management (HRM) literature for more rigorous empirical research into the relationship - or 'fit' - between HRM policies and practices and tangible organisational outcomes (e.g. Guest, 1987; 1996). But it is also part of a longer research tradition in the social sciences which has focused on the study of small groups in organisations (e.g. Mayo, 1949; Likert, 1961; Trist, 1963; Hackman, 1990).

Although HRM and organisational groups and their performance are closely related, there is no significant body of research which has sought to examine relationships between the two phenomena. This is surprising but may reflect the lack of an empirical research tradition in the HRM literature. It may also be a consequence of the fact that 'the team' has been seized by popular management writers and consultants and offered as a remedy to the trauma and speed of continuous change. Perhaps in response, academics seem to have relegated teams to the margins of their scholarly inquiry. Whatever the real reason, groups and teams seldom receive more than cursory treatment in the HRM literature, usually within a broader discussion of work design or employee involvement.

This study argues that there is a need to re-evaluate the relationship between strategic HRM and teams for two reasons. First of all, the team is continuing to be a popular form of work organisation design in both 'blue collar' - or downstream - and 'white collar' - or upstream - work environments. Why the team has become popular is discussed at length in chapter two but, at its core, is a belief that the team is a lean, flexible and responsive design which meets product market demands for outstanding performance in terms of innovation, productivity, cost-effectiveness and customer satisfaction, *simultaneously*. There is an implicit assumption that the act of changing from an individual-centred to a team-centred work design will automatically deliver

high performance. This position is rejected in this study as prescriptive and deterministic. Teams and team working are treated as neutral concepts, not necessarily imbued with a propensity for high performance. The team is simply a *design choice*. However, if the team design option is chosen because an organisation believes that it is consistent with its overall product or service, market strategy and work systems configuration, then this presupposes that groups - rather than individuals - must be treated as the primary human resource (Shea and Guzzo, 1987). This, in turn, requires a fundamental re-evaluation of the organisation's approach to the management of its people at the level of its culture and values, structure and personnel systems.

The second reason is closely related to the first and is concerned with the relationship between HRM and organisational performance. Guest (1996) notes how much of the theory and research about the fit between HRM and external contingencies focuses on the external context, particularly the relationship between business strategy and market position (also discussed in chapter two). Unfortunately, this approach "is rather less helpful in progressing understanding about the precise nature and impact of HRM... and on the process whereby HRM is linked to performance" (Guest, 1996: 3). He continues by arguing that "what we need to work with is a behavioural model which explains why the (HRM) practices have an impact on workers and why this in turn has an impact on performance" (ibid: 9). Where organisations choose a team-centred over an individual-centred work design model, performance is attributable to the team and HR practices must support the specific needs and characteristics of this form of work organisation design.

Interestingly, this brief discourse on HRM's theoretical, empirical and practical need to establish internal 'fit' in organisations that choose a predominantly team-centred work design model leads us back to classical studies of the determinants of group effectiveness (e.g. Roethlisberger and Dickson, 1939; Homans, 1951; Seashore,

1954; McGrath, 1964; Trist, 1981; Hackman, 1987). Does this mean, then, that at a very significant level, attempts to evaluate the impact of HRM is no more than a continuation of research on group performance in organisations (e.g. Steiner, 1972; Nieva, Fleishman and Reick, 1978; Kolodny and Kiggundu, 1980; Gladstein, 1984)? This would certainly allow the possibility of an integration of the groups and HRM literatures, but it does question the distinctive contribution of HRM to our understanding of the antecedents of performance in many contemporary organisations.

It is anticipated that this study will assist in clarifying the relationship between research into group effectiveness and the emerging empirical studies of HRM and organisational performance. It will do this by developing a model of team performance which will be tested on a large sample of project teams within an organisation that has experienced considerable trauma in its product markets. The research will seek to show how the performance of team-centred organisations can be improved by the application of certain principles associated with heuristic HR models - but with emphasis on the isolation of critical predictor variables (Goodman, 1986) - to the team design process. In this, it will suggest that work design is a key - if not the key - HR lever because it provides conceptual and practical linkage between customer, product/service and labour process as a means by which to maximise the creation and realisation of surplus - or added - value.

Because of the importance attached by contemporary organisations experiencing the new industrial competition to the realisation of value produced in the labour process, attention will be paid to the specification of the criterion variables. Although epistemology dictates that these must be consistent with the level of analysis (i.e. the group), dependent variables will be selected because of their relationship with the overall performance of the organisation and will draw upon financial and non-financial indicators (customer satisfaction, productivity and project fee income). This

normative, open systems model of high team performance project team design will be developed and presented in chapter three. It will comprise seven hypotheses which, when tested, will increase our knowledge and understanding of the *design* factors that affect the performances of project teams.

Chapter four describes the epistemology and methodology which underpin the experimental research design in this study and explains, firstly, why a single case experiment was chosen over other methods, and, secondly, the process of converting theory into operational definitions and then into the physical act of data gathering. The chapter also briefly describes the events in the case study firm that preceded the empirical research. This chronological narrative is important because of the author's dual role as both researcher and actor in the case firm used for the experiment, and because it explains the context in which the research questions evolved. The organisational context influenced the author's conceptualisation of work design as a lever which might facilitate the creation of outputs that are valued by customers and other stakeholders in the valorisation process. It also determined the specificity of the research model to project teams and the possibilities for its generalisation to other similar environments. In summary, this phase of the research programme constituted a time of theory-building in which the writer made explicit the relationship between work organisation design and project team performance by developing a taxonomy which could be tested within the case study organisation.

The fifth chapter presents the results of the experiments performed using the data gathered from 49 project teams in the case firm. This provides the background to the discussion of the results in chapters six and seven. Chapter six discusses the meaning of the results at three levels: theoretical, empirical and practical and the discussion centres on the seven research hypotheses derived from the model of project team performance. Chapter seven identifies a number of the key themes that emerge from the results and considers these in greater depth. In particular the chapter questions

the unproblematic way in which ‘high performing teams’ and ‘synergistic team working’ are presented in the ‘pop-management’ literature as a panacea to the need for organisations to become more fluid and adaptable, able to combine cost-effectiveness and productivity with demonstrable value and customer service. It argues that most teams fail to achieve high levels of performance because insufficient attention is paid to creating appropriate antecedent conditions. This process of creating conditions in which teams develop performance processes which add value for the customer is presented as a process of work organisation design, albeit one that has widened in scope compared with earlier job design approaches (Buchanan, 1979).

The title of this work is *designing high performance teams for projects* and this encapsulates the main conclusion arising from this study. A project team is an increasingly popular form of work organisation that has emerged to manage complexity, instability and rapid change. As contemporary organisations decompose their hierarchies and functional silos in order to align their competencies to the needs of their clients, project teams are becoming a preferred vehicle for delivering solutions. But the selection of the ‘best’ or most knowledgeable individuals for the job is insufficient to guarantee an outstanding team performance. Most teams fail to escape mediocrity and very few can be labelled as ‘high performing’. Where customers demand unique solutions to complex projects, the ability to create teams that are competent and committed to generate these performances is a core organisational capability. The successful management of client projects therefore requires that Organisation’s carefully and systematically design their teams to deliver exceptional value-adding performances.

2.0. WORK DESIGN AND VALUE CREATION

2.1. Introduction

This chapter considers the role and significance of work design in the development of the labour process and as a mechanism for achieving and then sustaining competitive advantage. Its emphasis is primarily historical and suggests that the evolution of the labour process in capitalism can be conceptualised as a series of stages. These stages are not sequential nor deterministic but represent alternative choices within organisations based on an assessment of market and technological configurations. These different choices share a common and underlying focus on *the creation of value* in the labour process. The approach that organisations adopt in designing work is contingent upon the nature of their product and their product market and how value can best be created and maximised in the labour process and then realised in the market as profit.

The first section examines the evolution of the labour process within industrial capitalism up to circa 1970 and identifies the principal ‘design’ schools which have influenced the management of people within organisations. This section examines work design within the mass production economy and discusses the evolution of job design from scientific management through to neo-human relations approaches. It is suggested that, despite different social values and theories about what motivates people at work, these approaches shared a common commitment to the maximisation of value within the labour process. The following section argues that at some point between the late sixties and the early eighties, the dominant force in the seller-customer relationship was reversed. The new industrial competition was based on high customer expectations concerning choice, quality, price and service. Faced with the collapse of traditional markets, organisations have been required to shift to niche market positioning and to accept sharp reductions in profitability through competitive pricing. A key concern has been how products, production processes and customers can be connected to ensure that value produced in the labour process is realised in the

market. As a result, the management of people and work organisation have become important sites of competitive advantage as corporations seek to generate innovation, commitment, flexibility, quality and high performance from their employees. Management choices about empowerment and control are ultimately determined by how they perceive the creation of value can best be optimised in the labour process and realised in the market as profit.

The final section discusses the position of team working as a model of work design which has become increasingly prevalent during the eighties, but which has been around in various guises since the 1950s. Different forms of team working are identified which are determined by the specific value-creation needs within the production process. For example, product development and project-based management both involve significant change throughout the life-cycle of the task. It is difficult to proceduralise and control the change process and therefore significant learning and problem solving is required within the team. This is in contrast to, for example, a manufacturing environment where technology and just-in-time procurement systems enable total control over the quality of the product, and teams are used simply to generate continuous improvements in the production process (*Kaizen*).

2.2. Work Design, Value and the Labour Process

The notion of work organisation design implies that management (including HR personnel) are actively involved in initiating changes in the labour process which are oriented towards the accumulation of value and "profitable growth" (Child, 1974). This definition is closely aligned with the "labour process" approach which owes its intellectual origins to Marx's analysis of capitalism, and the work of Braverman (1974) and others (e.g. Friedman, 1977; Edwards, 1979). These writers assume that profit (surplus value) can be maximised where the worker is relieved of all skill,

discretion and autonomy in the performance of his or her task. Forms of work organisation are therefore viewed as hierarchical and authoritarian and designed to coerce maximum productivity from labour. From this perspective the policies and systems involved in managing people are primarily instruments of management control.

For Marx, value, or profit, is created in the production process, not in the market. How this happens is illustrated in the following relationship:

$$M \text{ ----- } C \text{ } P \text{ } C' \text{ ----- } M'$$

The capitalist sets to work the means of production and labour power (C) after an initial capital investment (M). Commodities are then produced in the production process (P) which have a market value (C'). These commodities are then sold in the market for profit (M'). "In commodity form, the additional value created within production is equal to the difference between C and C'" (Nolan, 1983: 300-1). If a worker is employed for an 8-hour period, and it only takes her 2 hours of labour to cover her costs, then the additional 6 hours is surplus and represents profit when realised in the market through the sale of products or services.

Labour process writers argue that the time that it takes for labour to cover its overhead costs has been the site of intense struggle between manager and worker. Palloix (1976) explains why this is so in the diagram below:

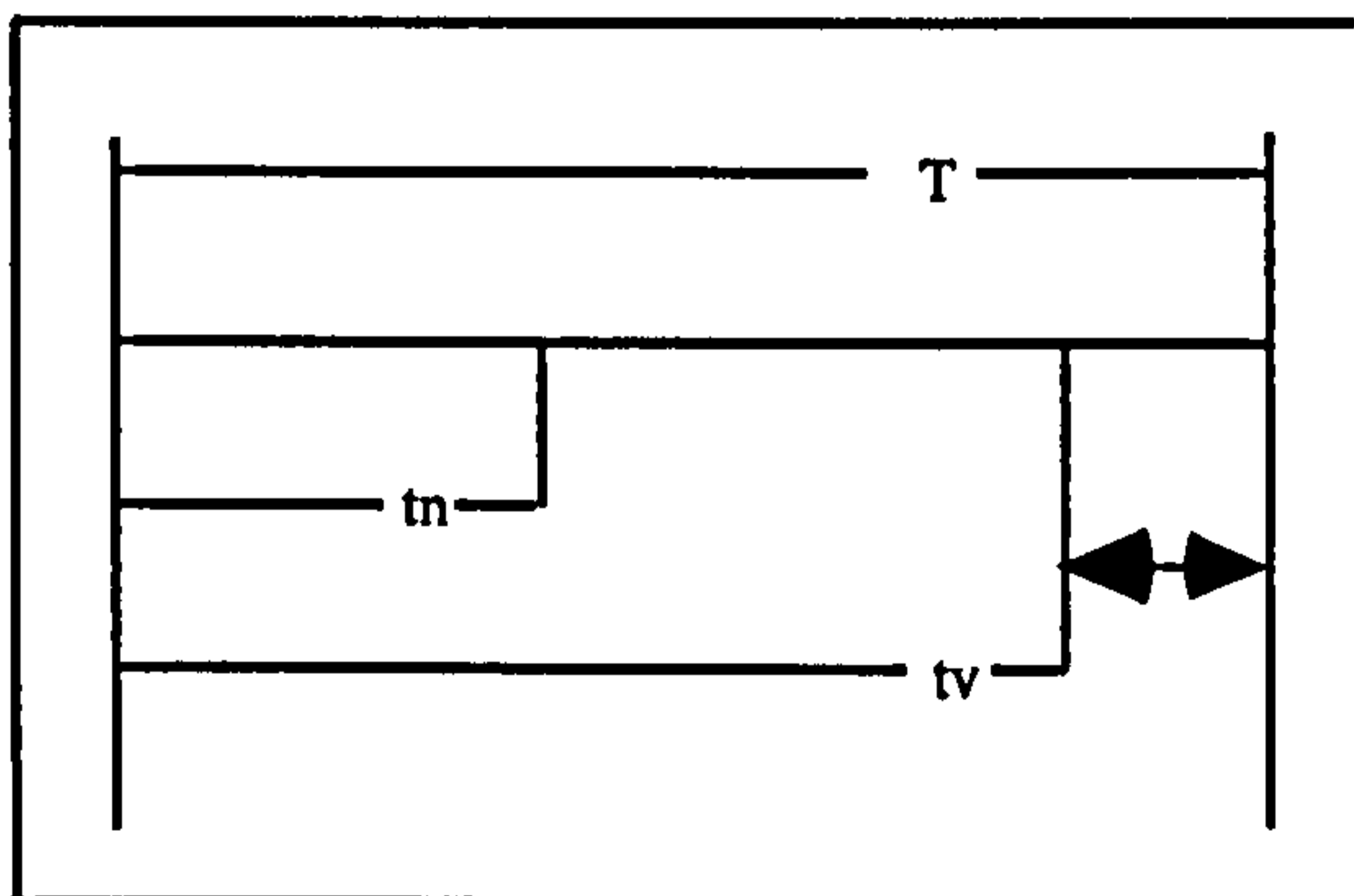


Figure 2.1: Maximising the Creation of Surplus Value in the Labour Process

'T' = the duration of the work, e.g. 8 hours;

'tn' = the time necessary for its reconstitution;

'tv' = the time devoted to production.

For the capitalist, 'T - tv' represents the degree of porosity in the labour process. During early capitalism, surplus value was maximised either by reducing wages ('tn') or by increasing the length of the working day ('T'). With the development of a collective working class consciousness and the success of organised labour in winning concessions on the length of the working day, Capital was increasingly forced to look at how surplus value could be maximised by increasing the labour time devoted to production ('tv'). Capitalism was gradually moving this way with the decomposition and reorganisation of work activities into a detailed division of labour. The production of the 'commodity' shifted from being the output of a skilled craftsman to being the social product of a group of interdependent workers. But it was only with the large-scale mechanisation of the labour process that significant increases in 'tv' were achieved. Machines allowed capital to design the labour process in a way that realised the primary objectives of valorisation: speed and predictability, continuity of production, the cheapening of labour, the intensification of work, and so on. His analysis of the onset of the period of 'machinofacture' led Marx to conclude that capital misuses machinery in order to transform the worker, "from his very childhood, into part of a specialised machine. In this way, not only are the expenses necessary for his reproduction considerably lessened, but at the same time his helpless dependence on the factory as a whole, and therefore upon the capitalist, is rendered complete" (Marx, 1976: 548-9).

In contrast to Marx, Braverman (1974) argues that the direct control of capital over the labour process did not occur in the period of manufacture, but with the diffusion and influence of the principles and practice of scientific management espoused by

Taylor, Gilbreth, Gantt, Bedaux, Rowan and Halsey. From his observation of output regulation by groups of workers at the Midvale and Bethlehem Steel companies, and management's inability to increase output because of both their lack of detailed understanding of production and their unwillingness to exert control over the labour process, Frederick Winslow Taylor proposed the following scientific work design principles:

1. a general principle of the maximum decomposition of work tasks;
2. the divorce of conception and execution;
3. the systematic pre-planning of each element of the labour process;
4. the minimisation of the skill requirements of any task leading to minimum job-learning times (Taylor, 1911).

The extent to which Taylorism became a dominant form of work organisation design in twentieth century capitalism is the subject of debate (Littler, 1982). Braverman's (1974) own position is clear: "it is impossible to overestimate the importance of the scientific management movement in the shaping of the modern corporation and indeed all institutions of capitalist society which carry on labour processes" (1974:86). Critics like Littler (1982, 1985) argue that Taylorism's impact has been extensive, but that it is impossible to detect a "direct simple line of influence" (1985: 13). In the US and the UK, job fragmentation, demarcation and the separation of mental and manual labour became the "dominant ideal for job design" (Littler, 1985: 13). More recently, Wickens, HR Director at Nissan, has stated that high performance in the auto industry requires the aggregation of the Tayloristic 'control' model and the human relations 'commitment' model: "If we are to achieve long-term high quality, we need to combine two elements - commitment of the workforce and control of the process. I call these two seemingly opposed objectives the paradox of production. One is a top down imposition; the other comes from bottom up" (Wickens, 1993a: 86; 1993b: 37-38). Similarly, a study of the successful Toyota-General Motors joint venture (New United Motors Inc.) by the Labour Education and

Research Project reported that the NUMMI system used psychological, social and physical stress to regulate and boost production (cited by Huczynski and Buchanan, 1991: 302), despite being publicly presented as an advanced team-based organisation.

By the middle of the twentieth century it was becoming clear that there were numerous psycho-social problems associated with work designed along the principles advocated by Taylor. Moreover, these human problems tended to result in falling levels of productivity from fatigue, absenteeism and turnover. An 18 month study of museum security guards in Idaho, for example, which involved several thousand covert intrusions within view of closed circuit television cameras, resulted in only 5 per cent of the intrusions being detected by the guards (Honan, 1978, cited in Hackman and Oldham, 1980). Evidence that scientific management might adversely affect labour motivation and productivity led to the emergence of a behavioural approach to work design which became known as the human relations (Maslow, 1943) and, later, neo-human relations (Herzberg, 1966; McGregor, 1960) movements. This approach is characterised by the assumption that job effectiveness and efficiency are correlates of intrinsic satisfaction. Satisfying work is viewed as the key to meeting personal needs for self-actualisation (Maslow, 1943). In turn, satisfaction at work is considered a precursor to individual motivation and therefore to performance (e.g. Vroom, 1964).

Early efforts to design work to make it more intrinsically satisfying centred on job rotation and job enlargement. Job rotation involves switching workers between several boring and repetitive jobs and therefore does not significantly impact on levels of intrinsic satisfaction. Job enlargement, however, attempts to reconstruct jobs that have been fragmented into separate specialisms and from the early fifties there is increasing incidence of this form of work redesign in sectors such as the car industry (Walker and Guest, 1952) and firms like IBM and Philips (Thornely and Valantine, 1968). However, there are problems with job enlargement. First of all,

not all jobs can be enlarged; secondly, not all workers want their jobs enlarged; and thirdly, the competency requirements of the enlarged job may be beyond the capabilities of the present job holder (Aldag and Brief, 1979).

As a motivational approach to job design, job enrichment has much in common with job enlargement since both accept the premise that job design should be based on an understanding of human needs for meaningful work. But whereas job enlargement assumes that meaningfulness is determined by the number and variety of tasks relative to the whole job (job size), job enrichment considers the kind of task performed to be more important. The most influential contributors to the development of job enrichment techniques have been Herzberg (1966) and Hackman and Oldham (1975, 1980). Herzberg's 'two factor theory' is well known and is based on a study of 203 accountants and engineers at the Psychological Service of Pittsburgh. The primary determinants of employee satisfaction were identified as factors intrinsic to the job such as recognition, achievement, responsibility, advancement, and personal growth in competence. These *motivators* were distinguished from *hygiene* factors which were extrinsic to the job and caused dissatisfaction, and included company policies, supervisory practices, salary, status, security and working conditions.

The two-factor theory has attracted considerable criticism, despite being the catalyst for a series of job enrichment projects in organisations such as ICI, AT&T and the DVLC. The principal objection is that Herzberg's model assumes that "everyone is potentially a motivation-seeker or self-actualizer, and this is an indication of mental health. Hygiene seekers are considered to be mentally unhealthy and have been blocked at the hygiene level by some unfortunate past experience. This position is not consistent with the facts of individual differences. It is not reasonable to question the psychological well-being of everyone who rejects increased work-load and responsibility" (Buchanan, 1989: 88). Although similarly grounded in expectancy

theory, Hackman and Oldham attempt to overcome this conceptual and empirical difficulty by focusing on the objective *characteristics* of individual jobs. Their approach is to build into jobs those attributes that create conditions for high work motivation, satisfaction and performance (Hackman and Oldham, 1980: 59). They avoid Herzberg's dilemma by clearly separating five core job dimensions from employee psychological states which are "not directly manipulable in designing or managing work" (Hackman and Oldham, 1980: 77), but still tend to abstract the individual from the structure of social relations (Knights, Willmott and Collinson, 1985: 2). The five job characteristics are as follows:

1. Skill variety. Jobs that require a variety of different skills are more meaningful than those that require only one or a few skills.
2. Task identity. Jobs that constitute a whole piece of work are more meaningful than those that consist of some portion of the whole job.
3. Task significance. Jobs that have an identifiable importance to others are more meaningful than those that do not.
4. Autonomy. Jobs that allow the worker independence, freedom, and decision-making authority with respect to job performance are more meaningful than those that do not.
5. Job feedback. Jobs that provide built-in feedback as to individual performance are more meaningful than those that do not.

The complete job characteristics model is presented below.

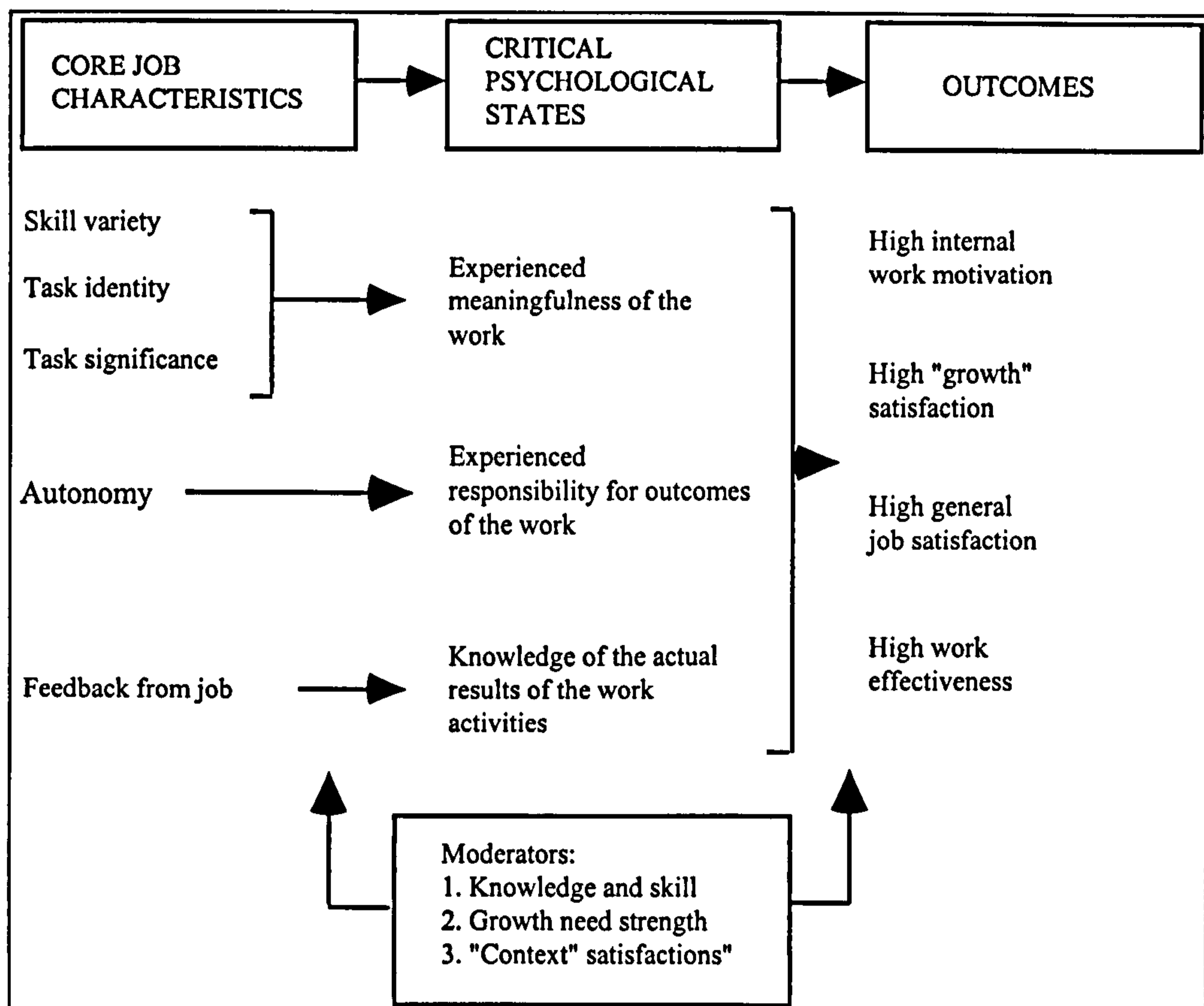


Figure 2.2: The Job Characteristics Model (Hackman and Oldham, 1980: 90).

For Hackman and Oldham, the design of work systems is a point of leverage for planned organisational transformation since its objective is to achieve behavioural change. At the level of the individual task, Hackman and Oldham suggest that the specific characteristics of a job, and therefore the behaviour of the job-holder, can be changed by pursuing a number of alternative strategies. These are (1) combining tasks, (2) forming natural work units around, for example, customers or types of business, (3) establishing direct relationships between the job holder and her customers and suppliers (both internal and external), (4) vertically loading a job by pushing down responsibility and authority to the job holder, and (5) giving better quality and more regular feedback to the job holder on his work performance. By ensuring that these redesign initiatives are reinforced and supported by other HR levers, such as payment and training and development systems, behavioural changes are more likely to be sustained. It is important to recognise that the Hackman and

Oldham job characteristics model *does not address behaviour* as the primary site of intervention, and this is a principle underpinning the development of the research model in this study. This is in contrast to the T-Group and Tavistock Conference approach to group awareness that was popular in the 1960s (Miller, 1989). Work effectiveness, and therefore value, is enhanced by creating conditions which produce desired 'critical psychological states' in the individual which alter that individual's experience of work.

This brief review of the principal contributors to the ideology and practice of work organisation design has indicated that there have been times when a particular approach to the management of people has been more dominant than at other times. The shift in the relative balance of influence from Taylorism, for example, to Human Relations in the 1950s, was based on the acquisition of new knowledge about what motivates people. The Hawthorne experiments are a classic example of this (Mayo, 1939). But beneath the different techniques, whether they lean towards time and motion studies or to job enrichment programmes, there seems to be one factor which ultimately determines the nature of work organisation design within capitalism: the *assumptions* that managers make about their roles and the structural and social forces which shape these assumptions and subsequent behaviours. The Marx-inspired Labour Process writers argue that these assumptions are based on management's overriding aim to maximise value by progressively subordinating workers to the means of production. Management is presented as a single, uniform class, and imbued with a common aim which is to secure material advantage through the redesign of work.

The labour process approach is, however, flawed, and there have been several attempts to break with its inherent fatalism (e.g. Cressey and MacInnes, 1980). Essentially, these revisionists identify the "contradictoriness of capital's strategy in the workplace" (Cressey and MacInnes, 1980: 12) and reject deterministic

explanations of work redesign either as a simple extension of managerial control or as evidence of pluralist-democratic gains by workers and their representatives. Accordingly, conventional perspectives on job enrichment and managerial strategy are abandoned in place of a framework which explains the organisation of work in terms of structural factors, such as changes in technology and competition. Managerial assumptions are therefore shaped by a more complex set of phenomena than naive humanism or commercial self-interest. This phenomena will include the need not only to produce surplus value but also to realise it in turbulent product markets (Kelly, 1985), the need to secure the consent of the workforce as well as its compliance (Burawoy, 1979; Hill, 1981), the need to ingest new technology (Coombs, 1985; Clark and Staunton, 1988), the competency of senior managers (Argyris, 1992), the possibility of attenuation between managerial policy and its implementation (Mintzberg, 1990), worker resistance to increases in managerial control (Edwards, 1986), and the increasing complexity of markets which requires greater flexibility and autonomous decision-making among groups of knowledge workers.

A second approach to understanding management assumptions and behaviour is derived from Thomas Kuhn's analysis of scientific revolutions (1970). Kuhn writes persuasively that life experiences are translated into patterns of thinking, or "paradigms", through which social reality is perceived and then interpreted. Thus scientists throughout history have screened out information which could not be explained by prevailing scientific paradigms, even though this information, when finally understood, often led to scientific breakthroughs (e.g. the earth-centred universe and flat earth paradigms). More recently, Barker (1990) has proposed "paradigm paralysis" as a barrier to organisational innovation and change, using the example of the Swiss watchmakers who, because of their devotion to the analogue watch paradigm, were blinded to the possibilities inherent in digital technology. Two competing paradigms are evident in the enduring work of McGregor (1960). In

setting a trend for a generation of trainers and organisational psychologists, McGregor stated that managers fall into one of two churches: those who assume that most people are lazy, need to be coerced, respond to punishment and direction, and are not very smart (Theory X); and those managers who assume that people generally like to work, have the capacity for self-control in pursuit of objectives to which they are committed, are creative and responsible, and want to do a good job (Theory Y). Although a dangerously oversimplified model of human nature, Theory X/Theory Y is relevant to the construction of our understanding of the complexities of work organisation design. In the first place, the differentiation between theory X and theory Y obviously replicates the contrasting perspectives of the Taylorite and human relations approaches to the management of people. But secondly, and more importantly, the design of team-based forms of work organisation as a response to the need for high levels of performance in highly competitive and fragmented markets necessitates the adoption of a set of assumptions about people which are theory Y in orientation (Walton, 1985).

Although discussed chronologically, the blocks of thought presented in this section should not be viewed as a series of stereotyped stages of industrial development, with work design genres following each other in logical and linear sequence. This would reduce history to a collection of over-simplified, radical breaks, and ignore patterns of continuity and change. Instead, these ideological formulations (Marxism, Taylorism, Human Relations, Neo-Human Relations) should be seen as influences on the development of managerial assumptions and value systems which are alternatively stronger or weaker at different points in history depending upon movements in the structure of economic and social relations in capitalism. The present economic crisis of over-capacity, consumerism, and intense global competition, has exposed the limits of scientific management - at least in competitive environments where intellectual productivity is more important than physical productivity - and has revitalised interest in work organisation design. But we must

be careful not to over-simplify the contradictions that riddle the concept of design and the myriad contingent possibilities for forms of work organisation that exist. If it is the market that initially triggers organisational transformation, then it is management's values that set the bounds of design acceptability, and it is the character of the social relations within the firm that determines work organisation's precise institutional form. The next section will elaborate on these points and examine how the need for value to be realised in the market, as well as maximised in the labour process, has set the development of work design theory and practice on a new trajectory.

2.3. Work Design, Value and the Market

It has been argued that Western Europe has been in economic decline since the late sixties and that its cause has been the sluggish adaptation to changed market conditions (Teague, 1990). According to Piore and Sabel (1984), "the present deterioration in economic performance results from the limits of the model of industrial development that is founded on mass production: the use of special purpose, product-specific machines and of semi-skilled workers to produce standardised goods" (1984: 4). The end of industrialism as a historical epoch is associated with the idea that society is moving towards a new post-industrial era. This is characterised by the decline of the social and economic structures which have reproduced themselves since the Industrial Revolution, particularly the division of labour and hierarchical organisation. The business response to consumerism and to the new industrial competition is predicated on outcomes such as flexibility, quality, innovation, customer satisfaction and high performance. The pursuit of these outcomes has created a renewed interest in the management of people generally, and work design specifically, as strategic responses to the crisis. Following an examination of the post-industrial argument, this section will discuss how people management, or HRM, and work design have been used as levers to extend the value

creation process into the market by attempting to integrate consumer and market processes, with business strategy and product development, and management of people and work organisation practices.

2.3.1. Flexible Specialisation

According to Piore and Sabel (1984), the demise of Fordism as a model of work organisation was a consequence of its internal dynamic which was to over-produce. By the end of the sixties, domestic consumption of the goods that had fuelled the post-war expansion reached saturation point: in 1979, there was a car for every two United States citizens; between 1950 and 1980, the number of US households who owned a television increased from 47% to 99%; by 1980, 99% of all households owned refrigerators, radios and electric irons, while 90% had washing machines, toasters and vacuum cleaners (figures from Piore and Sabel, 1984: 184). Attempts to penetrate less-developed markets overseas exacerbated the crisis, as third-world producers joined Western firms in flooding markets with consumer durables (Sabel, 1982: 195-199). But over-supply and market saturation was not the only problem that beset manufacturers. Piore and Sabel write of a trend towards diversity in the "tastes" of consumers (1984: 189f). The rise in disposable incomes and its convergence with a creeping "cultural revolution" during the sixties, together with an intensification of competition, forced firms to "woo customers by differentiating their products and re-educating the public to appreciate them" (Piore and Sabel, 1984: 191). With a rapid fall in overall demand for mass-produced, homogenised products, and the increasing volatility of consumer preference, forms of work organisation based on dedicated capital machinery and highly specific roles and skills increasingly became incongruous with the need for a more flexible production capability. Hence what Piore and Sabel call the "Second Industrial Divide" was manifested in the disarticulation of product market, product and production process.

Flexible specialization is proposed by Piore and Sabel as a new orthodoxy of economic management and industrial restructuring. Broadly, flexible specialization is characterised by the re-emergence of the craft tradition which combines industrial democracy with flexible work arrangements, and the resurgence of the industrial district with small firms engaged in specialist production ranging from textiles to metalworking (Piore and Sabel, 1984: 282). The flexible specialization thesis has generated much critical interest (e.g. Pollert, 1991), and is a member of a family of several alternative models of post-industrialism which include post-Fordism and disorganised capitalism (Lash and Urry, 1987). Its relevance here, though, is in its recognition of the serious discrepancies between the demands of the environment and the capabilities of the organisation and its conceptual linkage of product market instability with new forms of work organisation.

The flexible specialization thesis has not been immune to criticism. Pollert (1991) argues that the flexible specialization thesis has mystified the complexity of the capital-labour relation and the nature of social transformation, and "overlooks the role of human agency in history" (1991: 30). She suggests that unitarist, post-modernist models of capital-labour harmonisation obscure the complexities of the wage-labour relation. McIlroy (1988) suggests that "flexibility is a tactical plan linked to survival, not a strategy" (1988: 200), while for Hyman (1992) there is nothing new in the postmodernist segmentation of the internal labour market between core and periphery workers and the 'core = skilled = flexible, periphery = unskilled = inflexible' caricature (1992: 259-260). Elger (1991) is similarly sceptical of the thesis and argues that flexibility has not seen the widespread upskilling of labour forces, but "change in aspects of task flexibility, of a sort which may best be characterised in terms of increased managerial control over 'manning', modest task enlargement and an intensification of work" (1991: 63). Although accepting the prognosis that the paradigm of Fordism has been severely threatened during the last two decades, Amin doubts whether it is possible to speak of "one single and dominant principle" of

flexible specialization (1991: 136). Based on extensive case-study research in the food industry, Smith, Child and Rowlinson (1990) found evidence for the fragmentation of demand for chocolate confectionery contradictory. Mass producers in this sector are concerned with achieving greater product standardisation based around a few core brands. Insofar as the production process and work organisation is concerned, the re-emergence of craft skills is not in evidence and a gender-based division of labour is still typical. In terms of the impact of resultant changes in work organisation on the condition of workers, Terry (1989), for example, has found evidence that product market pressures have been used to extract significant concessions from workers in parts of the manufacturing sector. These included job losses and work redesign which resulted in the intensification of work.

The analysis of the structural crisis in capitalism highlighted by the flexible specialization school is an important point from which to analyse the environmental factors that have impelled structural transformation in the social relations of production, although we must be 'sensitive to the significance of both *flux* and stability, and to the interrelationship between the two' in our interpretation of historical patterns of continuity and change (Hyman, 1992: 261). It is important to complement this approach with a detailed and grounded review of the interaction between product and labour markets, management strategy and values, and changes in technology and the labour process within different firms and sectors, as this is where the precise nature of organisational transformations is revealed. It is dangerous to "exaggerate the breaks and ruptures of historical development" (Thompson, 1993: 189) and to assume that mass production and mass consumption are universally dead. The experience of the UK construction industry, for example, is one of over-production during the eighties which has resulted in severe and prolonged recession during the nineties. Individual firms have responded to the crisis with extreme 'right-sizing' and a spate of product and organisational initiatives designed to attract increasingly cost-conscious clients. There has been some de-

skilling in production as trends towards off-site pre-fabrication continue, while project management teams still work within an essentially adversarial and fragmented development process (Latham, 1994). Overall, the UK construction industry has remained relatively inviolate from substantive change in the design of its work processes, over and above the general tendency towards work intensification. However, it is argued that work organisation design can lead to increased competitive performance by effectively linking the product demands of the client with the performance processes of the project management team. This can ensure that value creation and realisation processes are joined.

2.3.2. Human Resource Management

The structural contradictions in so-called post-industrial economies have required organisations to re-evaluate their business strategies. Those firms in mature sectors who are attempting to move from mass manufacturing and general marketing aimed at profit through volume production to niche positioning and profits through premium pricing, for example, are realising that this type of strategic shift requires a quantum restructuring of their organisational architecture. Flexible specialisation was discussed as a model for examining the links between product markets, products, business strategies and forms of work organisation. The flexible specialisation thesis proposes the re-emergence of the craft tradition within post-industrial organisations which combines industrial democracy and flexible working relationships. Social relationships based on the 'tell and control' philosophies of Taylor and Ford are anachronistic when the priority is how to stimulate organisational creativity and responsiveness within key business processes. Patterns of work organisation which facilitate the creation of a capacity for continuous learning and improvement are inconsistent with *theory X* (McGregor, 1960) assumptions of human behaviour. The logic and rationale of large sections of the industrial organisational system is turned on its head: change replaces stability, self-control replaces supervision, effectiveness

replaces efficiency, complexity replaces simplification, and teamwork replaces individualism. The challenge for the firm is how to create an environment in which the contribution of its human resources can be maximised. This section will consider the evolution of the philosophy and practice of the management of people within industrial and post industrial organisations.

The underlying rationale for this ideological shift away from models of managerial control expressed in figure 2.2. above is the potential contribution that employees can make to business performance. The firm's ability to integrate markets, business strategy and work organisation with any degree of coherence is problematical. Strategic Human Resource Management (HRM) is proposed as a framework for managing the complex information exchanges and responses between and within these levels. Thus when corporate objectives and policies are geared towards increasing efficiency, quality and innovation simultaneously by securing employee commitment, adaptability and performance, a theoretical link between corporate strategy and HRM is revealed (Legge, 1989; McKinlay and Starkey, 1992). Purcell (1989) develops this relationship by drawing on the popular categorisation of productive units by their cash flow characteristics (Boston Consulting Group, 1970). In the 'cash cow', which has a dominant share of a slow growing, mature market, personnel policies will emphasise cost control and efficiency, albeit within a paternalistic culture. In 'dogs', where the productive unit has low share of a slow growing market, efficiency improvements will be achieved by down-sizing, work intensification and reduction of overhead costs. In markets where the 'star' has high share of a fast growing market, policies to stimulate flexibility, creativity and teamwork will be at a premium. And the 'problem child' which has a low share of a fast growing market - but which has the potential to develop into a 'star' - will nurture learning and innovation through investment in training and development.

Although useful, the portfolio planning model tends towards fatalism and assumes that productive units are locked into their fates. This effectively precludes possibilities for re-generation and de-maturity (e.g. Abernathy, 1983). The experience of Ford US (Pascale, 1990) during the 1980s supports the thesis that personnel strategies to stimulate commitment and involvement do exist in 'dogs' and 'cash cows'. The post-1979 recession was accompanied in Ford US by the introduction of Employee Involvement and Participative Management schemes (Pascale, 1990). Similarly, the rapid decline of the UK construction management market has seen a dual response in the personnel policies of leading players in the building industry. Reduction in overhead through down-sizing and efforts to increase productivity co-exists with initiatives to increase participation and team working.

Miles and Snow (1984) have developed an equally popular typology of the various ways in which an organisation relates to its market environment. Their model, however, offers the organisation greater potential for strategic shift and is less dependent upon product market determinism. They distinguish four basic strategic types: *defenders* who seal off a market and seek to dominate it through competitive efficiency (e.g. Royal Mail, Tate and Lyle); *analysers* who imitate competitors to enter new markets but remain strong in their core businesses (IBM, Shell, ICI); *prospectors* who constantly seek new markets and products to develop (Hanson, BAT); and *reactors* who are at the mercy of their market environments (NHS). Herriot and Pinder (1992) argue that defenders have been forced to respond to the aggressive attempts of analysers and prospectors to enter their traditional markets. Thus defenders have sought themselves to become prospectors or analysers, or have been overtaken by events and pushed into reactor mode (Herriot and Pinder, 1992:36). Miles and Snow (1984) suggest that defenders, analysers and prospectors will typically follow very different HRM strategies. Defenders will 'build' human resources, prospectors will 'acquire' human resources, and analysers will 'allocate' human resources. Legge (1989) develops this by arguing that these strategies will

have different implications for choice of policy. In terms of recruitment and selection, for example, the defender will engage in little recruitment above entry level, preferring to develop a strong internal labour market through vocational training and development programmes; the prospector will attempt to buy in sector-specific skills and may employ sophisticated selection practices such as psychometric testing; while the analyser will utilise a combination of 'make' or 'buy' policies depending upon the nature of the product or service.

The dilemma for firms trying to *shift* is how to achieve integration between the new business strategy and the HRM priorities that are associated with it. Defenders attempting to become analysers will want to develop their skills in new product and market areas very quickly. This may involve the introduction of performance management systems which link reward to the acquisition of new competencies. Developing these competencies will require a higher investment in management development or increased mobility of employees between business units. The lifetime employment guarantee which is a feature of defender organisations is replaced by a concentration on the development and performance of individuals. The shift from defender to prospector also necessitates a reformulation of the psychological contract between employer and employee. The recruitment of new stars results in a visible transfer from collective to individual values which can create internal confusion: the reward of individual effort through performance-related pay schemes can appear inconsistent with the philosophy and practice of team working. The management of change is therefore a key priority.

Because of the association between human resource strategies and the policies and actions of personnel specialists, there is a tendency to view change management as an outcome of traditional personnel interventions. In the previous discussion of how firms may integrate their business and human resource strategies, for example, the role that recruitment, compensation or training can play in achieving harmonisation

was emphasised. These factors are important but only insofar as they portray attempts by firms to challenge the traditional balance of power within the workplace. The literature suggests that one important expression of HRM is the extent to which line managers take control of personnel activities like recruitment and performance management (Legge, 1995). This, though, is an over-simplification. The role of the manager is changing as firms recognise that high performance requires the redesign of tasks and roles around business processes or the greater use of project management techniques. As the hierarchical layers of protection that shield the operations manager from direct accountability are removed and pressures to achieve high performance are intensified, the empowerment of team members becomes an organisational *sine qua non*. But just bringing people together and calling them a team does not guarantee high performance. The manager must meld the team through the exercise of new competencies such as facilitation, Socratic coaching, leading by example, and so on. The internalisation of HRM by the line manager is revealed in the development and practice of competencies and behaviours which are the anathema of those (*theory X*) behaviours and values that underpinned social relations during the heyday of mass production. HRM in the modern organisation may therefore be conceptualised as a combination of two, inter-related factors: firstly, as an information framework for linking business strategy with patterns of work organisation and social relationships ('external fit'). And secondly, as a series of non-standard, contingent line-manager behaviours which can create a team climate for effectiveness and high performance ('internal fit').

The view that personnel management policies are increasingly being developed and implemented in concert with business strategies has led a number of writers to the conclusion that this represents a fundamental change in the role of personnel functions (Goldsmith and Clutterbuck, 1984; Martin and Nicholls, 1987). This change is supposedly revealed in the widespread substitution of the term 'personnel management' by "human resource management" (although see Guest and Hoque,

1993: 40-41) and in the appearance of new magazines and books with HRM in the title (e.g. Human Resources; IJHRM). While the concept and definition originates from its adoption and dissemination within US organisations and business schools during the 1980s, in the UK, HRM has been associated with an evolutionary shift from the pluralistic, conflictual industrial relations of the Donovan era to a new industrial climate based on progressive people policies grounded in mutual interests. Storey (1989) notes how, "even in conventional, mainstream organisations... current 'flavours' have permeated the managerial consciousness and imagination in a way that was never the case with, for example, OD, job enrichment, QWL and other much vaunted 'movements' of previous decades..." (1989:1). The appearance of new, entrepreneurial organisational forms like Strategic Business Units, and the interest in culturally-based programmes like Total Quality Management (TQM), do not constitute irrefutable proof of the existence of HRM but do point to the fact that employees are now being considered as a valued resource which can contribute to organisational effectiveness, rather than as an overhead to be minimised (Beaumont, 1992: 21).

In a critical analysis of HRM which encompasses a comparison of UK and US models of personnel management and HRM, Legge (1989) concludes that "the use of the 'new label' is no more or no less than a reflection of the rise of the 'new right'" (1989:40). She argues that HRM is essentially an attempt by personnel managers to shake off the do-gooding ideology that spawned job enrichment and T-groups, and a symbolic funeral pyre on which to burn the portraits of submissive IR managers kow-towing to union militants. Linking traditional personnel activities like selection, appraisal, reward and development to corporate strategy empowers personnel departments to adopt a more assertive role. Degrees of 'softness' and 'hardness' allow the new HR manager to treat core and periphery workers in contrasting ways: peripheral workers can be procured and released at will; while core knowledge workers who are central to competitive advantage can be reassured, supported and

attached to the organisation through sophisticated HR policies and systems. Reflecting on his personal involvement in a factory relocation project earlier in his career, Jim Foulds (1989) identifies a visible shift in the philosophy of both business and personnel department: "The personnel manager [had been] a part, not only of that factory, but of the whole, integrated community. The job lacked a certain degree of depth and sophistication but made up for this with its width. Business played a wider role than meeting its own objectives... And now? The factory is empty. It stands isolated in a desert of grass... To me this epitomises the change of the last 20 years. Our function has moved closer to mainstream business. We have got involved with necessary strategic change. We are more professional in our tasks... But what price have we paid for this change? How do we bring more of the human touch back into personnel management?" (1989: 38).

This is a dilemma for HRM. Whilst it owes its intellectual origins to the philanthropic human relations movement, its quest to occupy a more central place among the organisation's decision-making elite means that its policies and actions must be seen to add measurable value to the business. There are three issues here. First of all, because there is a tendency to accept the link between environmental triggers and changing business strategy, the process by which HR strategies are formulated and implemented is seen as unproblematic. This ignores the complexities and realities of organisational politics and culture within the managerial hierarchy (Pettigrew, 1985). Secondly, despite the self-styled, bottom-line orientation of the HRM paradigm, and the various models which propose a relationship between HRM policies and different business strategies (e.g. Purcell, 1989; Schuler and Jackson, 1987), there is very little empirical evidence to support the thesis that HRM practices have had a positive impact on organisational performance. This is supported by the relative absence of case studies which reveal strong relationships between, for example, employee involvement and productivity or between performance and performance-related pay. And finally, there is Legge's concern that HRM is

underpinned by an ideology which is simply designed to make unilateral management action more acceptable (Legge, 1989: 31).

Despite the conceptual logic of models which propose the integration of HRM with business strategy and competitive performance, there is little empirical evidence of the widespread incidence of firms which have achieved this linkage. Bassett's (1986) account of IBM's alterations to its manpower planning, performance management and communications systems in relation to projected changes in its market environment is an isolated example. Nevertheless, the development of a theory of HRM which achieves 'fit' or integration between human resources and strategic management has continued. Guest (1987) suggests that human resource management comprises a set of policies designed to foster the commitment, flexibility and quality of the workforce. Although commendable in themselves, these policies only deliver real competitive advantage when integration with business strategy is achieved. This, in turn, is only realistic where human resource policies cohere with other areas of policy and with each other, where line managers accept that managing people is their responsibility, where employees feel integrated into the business, and where the firm adopts long term perspectives on human resource planning in place of short term expediency (Guest, 1987: 512; Guest, 1989: 42). And lastly, strategic integration is more likely to be achieved where the organisation succeeds in creating an all-embracing HRM philosophy or culture (Hendry, Pettigrew and Sparrow, 1989).

Guest's approach is useful because, in his words, it offers a set of testable propositions which can be used as an interpretive framework to make sense of the reality of human resource management within different contexts, for example, between union and non-union firms. Guest's theory of HRM is shown in the model in figure 2.3. overleaf.

The four policy goals of integration, commitment, flexibility and quality are at the centre of Guest's model and all must be present to guarantee delivery of the desired organisational outcomes. It is implied in the model that the organisation's ability to improve its performance can be directly influenced by applying a cohesive set of HR policies (Hendry and Pettigrew, 1990). In practice, this might involve the identification of a profile of core competencies or behaviours that are required to implement an emergent corporate strategy, and the subsequent establishment of an integrated recruitment, performance management, career planning, and training and development structure designed to achieve it (Mabey and Iles, 1993).

Policies	Human resource outcomes	Organisational outcomes
Organisational and job design		High job performance
Policy formulation and implementation/management of change	Strategic planning/ implementation	High problem-solving
Recruitment, selection and socialisation	Commitment	Successful change
Appraisal, training and development	Flexibility/adaptability	Low turnover
Manpower flows - through, up and out of the organisation		Low absence
Reward system	Quality	Low grievance level
Communication systems		High cost-effectiveness i.e. full utilisation of human resources

Figure 2.3: Policies for Identifying Human Resource and Organisational Outcomes (Guest, 1987: 516).

Although HRM suffers from problems of logical consistency (Noon, 1992) and a dearth of empirical support for its practice (Blyton and Turnbull, 1992), it does provide a conceptual model which can be used to examine the impact that management of people policies and practices might have on organisational

performance (e.g. Guest, 1987). Work design is a component of most models of HRM, either implicitly (e.g. Purcell and Sisson, 1993) or explicitly (e.g. Guest, 1987). In stressing the importance of integration between strategy and HRM and, internally, between each of the HRM levers, the literature on HRM fails to adequately assess the significance of work design as a lever for achieving desired organisational outcomes *in its own right*. This may explain the parallel development of models of work design which share a similar ideological underpinning but which are, nevertheless, quite distinct from HRM. Business Process Re-engineering (Hammer and Champy, 1993; Hammer, 1994) and High Performance Work Systems (Buchanan and McCalman, 1989) are two examples of this genre and both emphasise the transition to team-based forms of work organisation.

2.3.3. Integrating Customers, Products, Processes and Work Organisation forms.

Both the flexible specialisation thesis and the HRM literature suffer from a lack of empirical examination which support a connection between shifts in demand and changes in work organisation (Smith, 1991). More tangible evidence for the existence of this relationship is found in the work of a group of researchers in the US (e.g. Clark and Fujimoto, 1992) and the UK (e.g. Whipp and Clark, 1987), both of which draw their inspiration from the work of William Abernathy (1978). This research into the relationship between products and production processes and changing forms of industrial competition focused almost exclusively on the world auto industry and sought to learn about the sources of superior performance in product development. Despite this narrow focus, it is emphasised that “there are central themes in the auto story that apply generally to firms that must operate in a turbulent, intensely competitive environment” (Clark and Fujimoto, 1992: 337), and they cite high-end disk drives, micro-wavable soup and fast-track commercial construction as examples of similar approaches to new product development in other

sectors (1992: 345-352). Abernathy, Clark and Kantrow's (1983) Industrial Renaissance, Producing a Competitive Future for America is a classic statement of the 'new industrial competition' and describes "the failure of many of [the United States'] traditional manufacturing industries to adjust to a troubling set of competitive realities" (1983: xi). These realities take the form of overseas competitors who simultaneously achieve high levels of manufacturing performance and innovation in both product and production process technologies.

Abernathy and Utterback (1978) had earlier argued that there is a dynamic relationship between product and production process and that it is possible to identify specific stages in the evolution of industrial sectors. Following a product innovation such as, for example, the internal combustion engine, the new sector experiences a period of ferment during which time product innovations are radical and prolific (Abernathy and Utterback, 1975). As a dominant product design crystallises and is accepted by consumers (e.g. a wheel on each corner of the car), competition shifts towards price and production becomes characterised by incremental process innovations and capital investment in dedicated plant and machinery. As the sector matures, therefore, it moves towards oligopolistic concentration and production strategies based on cost-efficiency within a relatively stable market place. The forces that drive productive units towards high-volume operations are, first and foremost, the benefits that can be accrued from economies of scale. Innovation in the production of cars, such as the design and specialisation of semi-automatic machine tools, reduced job cycle times from 514 minutes in 1908-9 to 1.19 minutes in 1914. The introduction of the assembly line at Ford circa 1914 reduced the labour content of chassis assembly from 12.5 to 2 hours 40 minutes. The commercial advantages that followed left Ford's competitors with little choice but to install moving assembly lines themselves.

In terms of the condition of workers within the production process during this phase, we have already noted above the tendency towards deskilling associated with the production ideologies of Fordism and Taylorism. The assembler on Ford's production line had only one task which was to put, for example, one wheel on the corner of one car, or to turn two nuts onto two bolts. Someone else - the professional engineer - considered how all of the parts came together, skilled repair men fixed the assembler's tools or maintained the assembly line, another specialist checked quality, and so on. The division of labour was taken to its extreme, supervision was tight, training was quick, discipline was authoritarian. In 1922, Ford recorded in a survey of jobs in his plants that "the lightest jobs were again classified to discover how many of them required the use of full faculties, and we found that 670 could be filled by legless men, 2637 by one-legged men, two by armless men, 715 by one-armed men, and ten by blind men. Therefore, out of 7882 kinds of job... 4034 did not require full capacity" (quoted by Littler, 1985: 15). In this climate, Ford assumed correctly that production workers would offer no suggestions or assistance to maintain, let alone improve operations. These functions fell to the foreman and the engineers who reported back up the command chain to more senior management who then communicated their directives back down the organisational hierarchy to be implemented.

Abernathy et al argued that the trend towards industrial maturity can be tracked through the evolution of specific productive units. A productive unit is defined as "the integral production process that is located at one place under a common management to produce a particular product line" (Abernathy, 1978: 48). In the UK, research carried out in the Work Organisation Research Centre (WORC) at Aston University has broadened the concept of the productive unit to include work organisation, as well as the technology of product and production process (e.g. McKinlay, 1984; Clark, 1987a; Clark, 1987b; Starkey and McKinlay, 1987). Each of these three elements is considered as part of a total process. "The distinctive features

of the total process approach in WORC are to examine the translation of strategy into products and into production systems each of which embody technology and organisation as integral dimensions" (Clark, 1987: 7). Thus, in applying the sector life-cycle model from the US auto industry to the UK auto industry, Whipp and Clark (1986) present the life-cycle analysis shown in figure 2.4. below:

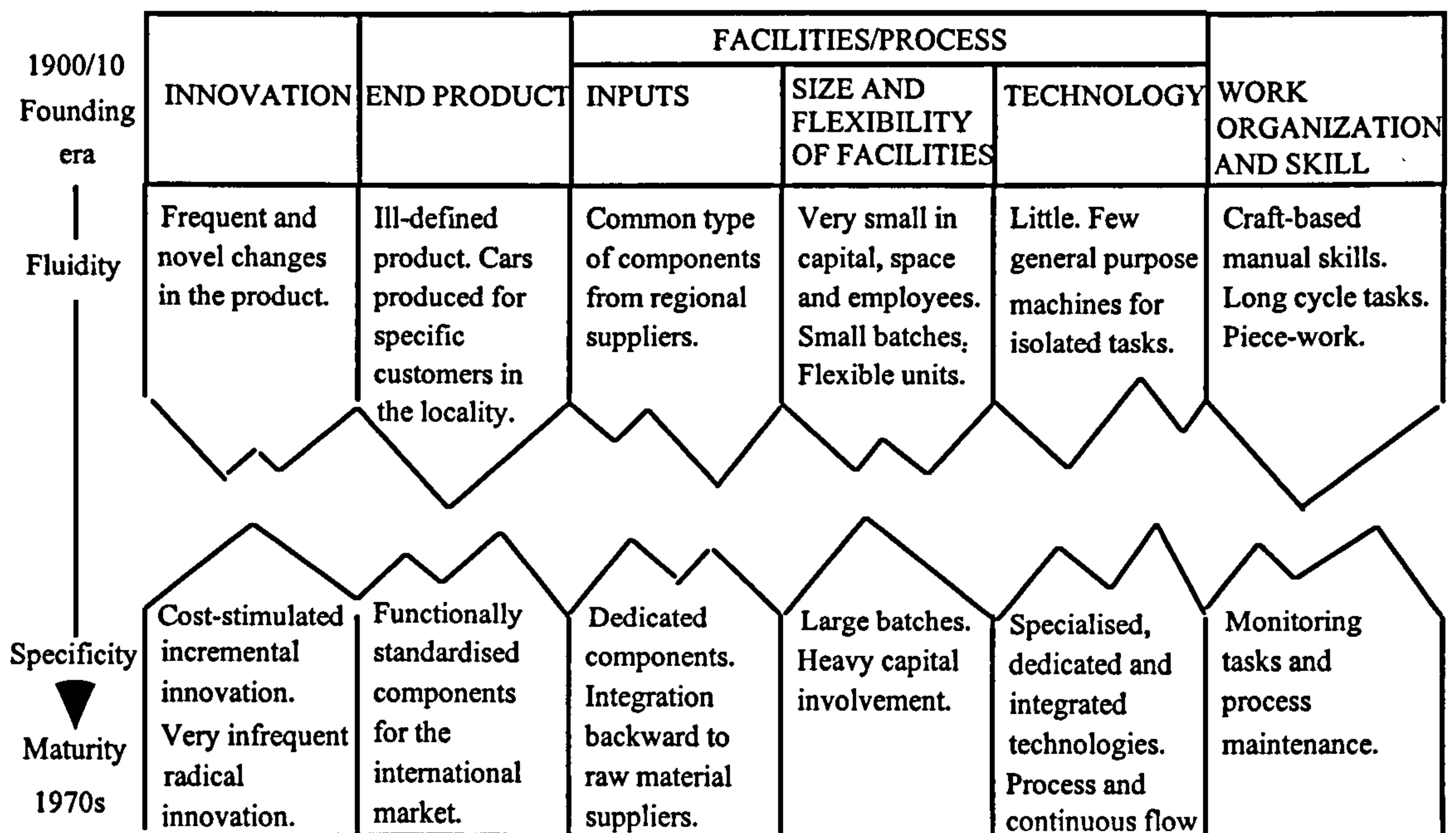


Figure 2.4: UK Auto Industry Sector Life Cycle (Whipp and Clark, 1986).

The evolution of the UK auto sector is revealed in, for example, the change in competitive emphasis from functional product performance to cost reduction, and in production processes from flexibility and inefficiency to efficiency and rigidity. Predominant types of innovation shift from frequent major changes in the product to incremental changes in products and production processes designed to improve productivity and quality. Mechanisms for organisational control cease being informal and entrepreneurial and become characterised instead by an emphasis on structure, specialisation, goals and rules. In the US, the introduction of standardisation into the design and production of cars allowed auto producers to compete on the basis of the slow, incremental modification of the large, American automobile. This was possible because of the homogeneity of the US consumer

market. But by the mid-seventies it was apparent that the consumer was searching for a faster rate of innovation. The structural rigidity of the mature American car producers precluded an effective response to the increasing penetration of US markets by overseas competitors who had discovered how to combine radical innovation in product concepts with high levels of performance in quality, productivity and lead-time (Clark and Fujimoto, 1992: Ch. 4).

The 'logic' of maturity drives the evolution of the productive unit to standardisation and inoculates it against competitively significant innovation. To some extent, this is a function of inertial tendencies within organisations which become embedded in rigid behavioural patterns (Green, 1988): it becomes painfully difficult for an organisation to change a historically successful recipe or formula. But the ageing process can be reversed. If a demand arises amongst consumers which is significantly different from that which preceded it, "producers may need to seek out new technology, to revise design concepts, to reintroduce innovation as an important element in competition, and to undertake a new round of iterative learning" (Abernathy, 1983: 27). The result is a change in the basis of competition away from basic refinements of core design concepts to paradigmatic changes in the concepts themselves. Inevitably this shift makes obsolete existing organisational competencies and capabilities and requires 'unfreezing' through fundamental changes in beliefs and cultures to support the required changes (Lewin, 1947).

Innovation has been described as always leading to improvements in performance (Rogers, 1983). Thus, innovations in technology, such as the introduction of a computerised accounts system, or in organisation, such as the change from a matrix to a bureaucratic structure, or in Human Resource Management, such as the introduction of a new approach to rewarding employees, are viewed in singularly optimistic terms. Clark (1986, 1987), however, argues that there is an inherent dilemma between a firm's orientation towards innovation and its need to maintain

efficiency in its existing production processes during transition. Firstly, the innovation may not increase the performance of the organisation; secondly, the cost of ingesting the innovation may outweigh its benefits to the organisation, and thirdly, the organisation may be structurally and/or culturally incapable of ingesting the innovation, irrespective of its potential competitive significance. This final point is critical. The ability to analyse the market and convert strategic choices into patterns of action (Stacey, 1993) is determined by what is actually possible within the confines of the production process and the organisation of work. The design of forms of work organisation which are flexible enough to adopt new innovations, while being sufficiently robust to maintain high levels of operating performance, and which encourage the creativity of participants, is a prerequisite of organisational success. But it is important to recognise that the scope of work design must be more comprehensive and embrace changes in leadership and culture, business processes and organisation design and technology (Buchanan, 1992).

2.4. Re-Designing Work: The Pursuit of Added Value Through Team Working

Organisations experiencing the new industrial competition must be flexible, customer-focused, innovative, cost-effective, quality-oriented and productive. These priorities have restored interest in work organisation as a possible site and source of competitive advantage. The form of work organisation which has emerged as the post-industrial alternative to specialisation and bureaucracy is team working. It has been argued that team working is a pivotal design principle in post-modern organisations (Clegg, 1992) and that teams get extraordinary things done because they maximise the potential for human performance (Tjosvold, 1991:4). This section will examine the team working phenomenon in historical context as a means of determining if the new teams are *qualitatively* different from earlier models of group working (such as quality circles) in terms of their ability to add value to products and services. It will also consider whether the emergence of the team reflects a more

fundamental change in management attitudes towards the management of people and if it is possible to generalise about the impact of team working in different industrial sectors.

Although care must be taken not to mystify the intricacies of transitions within individual firms and sectors by labelling them with the latest prescription, there is evidence that the late 1980s and 1990s constitute a period of quantum, revolutionary changes in organisations (Miller and Friesen, 1984; Johnson, 1987; Mintzberg, 1989) and that these changes have been impelled by the new industrial competition (Abernathy, 1983), innovations in technology (Perrow, 1983) and new consumerism (Piore and Sabel, 1984). In 1985 the British Institute of Management's *Organisation of Work Panel* reported that an increasing number of firms were attacking rigidities in work organisation. This was taking two forms: work reorganisation aimed at the more flexible use of skills (the flexing of the labour process); and organisational and managerial flexing which included an alteration of the balance between centralisation and decentralisation, accompanied by attempts to change organisational culture (BIM, 1985). The Trades Union movement also detected a greater preparedness among employers to "use [the] work force more intensively" (TUC, 1985: 26-27). This interest in the organisation of work was different to earlier versions in the 1960s and 1970s because it was not concerned primarily with altruistic efforts by industrial psychologists to increase the opportunity for self-fulfilment through work, but was driven by business leaders and academics who were recognising that intense international competition based on high quality, low cost, customer satisfaction and rapid new product development (Clark and Fujimoto, 1992) required a new approach to the management of people in organisations. This approach rejected work fragmentation and demarcation and favoured empowerment, functional flexibility (Cordury, Sevastos, Mueller and Parker, 1993) and self-control.

As an example of the new imperative in work organisation design, Safizadeh (1991) identifies seven primary forces behind the strategic re-examination of job design concepts in manufacturing operations: (1) the convergence of different manufacturing processes (continuous, repetitive and batch) towards a more flexible and automated process; (2) competition along new dimensions of reliable deliveries, shorter lead times, flexibility and rapid introduction of new products; (3) shorter product life-cycles which places a heavier premium on manufacturing flexibility; (4) direct interaction between the manufacturing operation and its environment (open manufacturing systems); (5) pressures to reduce stock inventories ("just-in-time"); (6) the goal of total quality control; (7) sophisticated manufacturing technology which requires better skilled workers (Safizadeh, 1991: 63-66). Walton and Susman (1987) similarly argue that advanced manufacturing technology can increase interdependencies between functions; skill requirements; the speed, scope and costs of errors; the sensitivity of performance to variation in skill, knowledge and attitudes; the pace of dynamic change and development; capital investment per employee; and dependence on smaller numbers of skilled people.

The pressures for change arising from turbulence in domestic and international product markets have created a need for a more flexible and customer-oriented organisation. Although there are many variations in the flexing strategies that firms can implement, it is possible to differentiate between two types of flexibility: horizontal and vertical flexibility; and numerical and functional flexibility. Horizontal flexibility can be defined as changing work organisation to allow the more flexible use of skills. Examples of this include Cadbury Limited during the 1970s: between 1978 and 1985 the number of blue collar workers was reduced from 8565 to 4508 and this was achieved through the introduction of continuous shift working, the reconstruction of production facilities at Bournville and Somerdale, the increased use of subcontracting, the phasing out of craft demarcation and a delayering of the line management hierarchy (Child and Smith, 1987: 579-581). Similar restructuring

strategies are visible at Pilkington where productivity increased by seven per cent per worker between 1981 and 1985 although 7000 jobs were shed (Starkey and McKinlay, 1988: 45). Vertical flexibility differentiates changes in the social relations of production from innovations in an organisation's overall structural and managerial processes. A key theme here is the ability of an organisation to restructure itself so that it is better able to interface with the external environment while retaining an internal logic of control (Lawrence and Lorsch, 1967; Peters and Waterman, 1982; Kanter, 1983).

Atkinson (1985a; 1985b) distinguishes between two types of flexibility which permits "responsiveness both to the level of economic activity (numerical flexibility) and to the nature of that activity (functional flexibility)" (Atkinson, 1985a: 3). Numerical flexibility allows adjustments to the number of workers, or the amount of worked hours, in accordance with changes in demand for them. Functional flexibility, on the other hand, is the ability of firms to reorganise jobs so that the job holder can deploy his or her skills across a broad range of tasks. Thus the firm's core employee population is required to have the requisite knowledge and attributes which allow functional flexibility, with secondary groups operating on the periphery in a variety of contractual relationships and able to provide highly specific skills or to 'take up the slack' when the market expands. Project management organisations operate in this way. The project manager's core employee group co-ordinate the procurement of the technical specialisms necessary to achieve the project's objectives. Since an increasing number of these specialisms are external to the project manager's organisation, his operating rationale increasingly becomes the employment of a range of management techniques such as "design management, scheduling, work breakdown analysis, task responsibility matrices, performance measurement, project organisation, cost control, contract administration, quality management and team selection and building" (Morris and Hough, 1987: 4).

Work organisation designs based upon the team model are increasingly popular in both upstream and downstream operations. Upstream, effective new product development is measured by how quickly a company can move from concept to market (Clark and Fujimoto, 1992: 69). This requires the application of specialist expertise in an integrated effort. Traditionally, different functional departments have worked independently on the development of new products, but this is being replaced by the use of cross-functional teams working together under the leadership of a product or project manager in a matrix organisation structure (Womack, Jones and Roos, 1990: ch.5). Downstream, changes in manufacturing processes have included the formation of work cells which are responsible for full cradle-to-grave production. Examples include the Carnaud Metalbox Sutton plant (Oliff and Stanford, 1995) and, in relation to downstream service operations, Rank Xerox UK (Geanuracos and Meiklejohn, 1993).

But as a distinctive form of work organisation, teams are not new. Teams have been around in various forms for hundreds of years. They are, for example, the basic organising unit of most armies and many sports. Yet teams are now being singled out as a key to corporate renewal. This is because teams seem to be appropriate where the business strategy emphasises customer satisfaction, flexibility, innovation, product quality and high performance. Where the business strategy places a greater focus on cost reduction, and the work can be done in a highly repetitive way by individuals with little outcome interdependency (Shea and Guzzo, 1987), teams are not a necessary work organisation design. But if, on the other hand, the work flow produces interdependency between workers, or if the task is highly complex and requires extensive problem solving capability or innovation, then improved or high performance is likely to depend on the utilisation of a team design.

The origins of modern team working lie in the job enrichment programmes of the late sixties and seventies and, like work design techniques which focus on the individual,

were influenced by the development of a humanistic psychology. The arrival of humanistic psychology in the 1960s coincided with the emergence of a culture of anti-materialism, anti-war, anti-science (and therefore anti-behaviourism and anti-psychoanalysis), and freedom for the individual (Medcof, 1979: 227). Although its major impact was in the field of therapy, *third force* thinking contributed to the awakening of interest in employee involvement and satisfaction and worker democracy. Symptomatic of this change in attitudes towards the social conditions of workers was the Donovan Commission's 1970 recommendations that led to the creation of legal protection for the positive right to associate (Lewis and Simpson, 1986: 52f). The nature and extent of worker democracy has since ebbed and flowed between improved communication through team-briefing, to representation on joint councils at departmental, plant and company level, to the idea of employee directors associated with the Bullock Committee of Inquiry (1977).

In terms of work organisation design, the two most well known team innovations are quality circles and autonomous work groups. A typical quality circle is a small team of volunteers of between six and eight people who meet on a regular basis (Lawler and Mohrman, 1985). Through these meetings teams work towards improving the quality of products or services, and in so doing develop their skills, promote communication and enhance the quality of work life (McDevitt Street Bovis, 1990: 5; Dale, 1984). In practice, members of the circle select the problem that they wish to tackle and apply a structured problem solving approach to its resolution. It is usual for the teams to receive training in interpersonal skills and problem solving techniques. Although originating in the USA and achieving widespread dissemination in Japan, the number of UK organisations with quality circles spread quickly during the seventies (IDS, 1985). Management's reasons for their introduction in both manufacturing and service sectors seem to emphasise the importance of 'process' issues, such as improved job satisfaction, employee development and communication, over and above the achievement of commercial

benefits like increased competitiveness, reduced costs and improved service quality (Dale, 1984; Lees and Dale, 1985). Insofar as degrees of success or failure are concerned, research evidence is contradictory. Following a two year project which involved a questionnaire survey and follow-up interviews, Dale and Lees (1986) reported that participants were generally supportive of the concept but were critical of the manner of their implementation. Other surveys reviewed by Collard and Dale (1989) suggest that there is evidence of the large scale suspension of quality circles resulting from redundancies, restructuring and lack of co-operation from middle management (1989: 366-369).

Another variant on teamwork job design is the autonomous work group which owes its origins to the pioneering 'systems' work of Eric Trist and his colleagues at the Tavistock Institute of Human Relations in London. Trained as a psychologist and influenced by the work of Lewin (1947), Trist's observations of leaderless group selection exercises during the war led him to conclude that (1) individual behaviour is affected by the groups of which they are members; and (2) strong leadership control can induce regressive subordinate behaviour (Pasmore and Khalsa, 1993: 549). After the war, Trist and his colleagues commenced research to understand what could be done to increase productivity and reduce absenteeism and mental illness in the nationalised coal industry. They discovered that different levels of mechanisation affected social relationships among miners and between miners and their managers (Trist and Bamforth, 1951). The traditional miner was a *composite collier* who worked without supervision and who could perform all of the tasks in the coal-face production cycle. He could choose who he worked with and what he did. In the Durham pits, however, the introduction of longwall mining methods shifted the locus of control to managers who were increasingly involved in decisions about the composition of teams. Moreover, the new technology determined the pace and cycle of the work itself. The mass production character of the longwall method led to an increase in the size of the shifts and a concomitant decline in communications and

good working relationships. "From the production engineering point of view it is possible to write an equation that 200 tons equals 40 men over 20 yards over 24 hours, but the psychological and social problems raised are of a new order when the work organisation transcends the limits of the traditional, small face-to-face group undertaking the complete task itself" (Pugh and Hickson, 1989: 186-7). This lack of *organisational choice* (Trist, Higgin, Murray and Pollock, 1963) caused a reaction against both managers and technology which resulted in falling productivity rates and rising accident, absenteeism and turnover levels. The increased complexity of the working environment caused by mechanisation, along with the specialisation and fragmentation of tasks, made job autonomy and self-regulation increasingly untenable and forced management to take a more active role in planning, co-ordinating and monitoring production.

Trist noticed, however, that the technology did not strictly dictate social relations. In some pits, self-regulating, leaderless, multi-skilled work groups had appeared and regained control of the work cycle. "With the same longwall technology, [the] composite organisation was found to possess characteristics more conducive than the conventional to productive effectiveness, low cost, work satisfaction, good relations, and social health" (Trist, Higgin, Murray and Pollock, 1963: 291). The range of possible human and economic outcomes led Trist to conclude that the joint optimisation of people and technology was the critical factor in determining the overall performance of the work system (Trist et al, 1963: 7). The implications for work organisation design are clear: "When social systems are designed into highly fragmented roles without common pay or goals, external control is required to assure compliance with intended behaviours, but external control is typically less effective than internal control and produces regressive rather than proactive behaviour" (Trist, quoted in Pasmore and Khalsa, 1993: 556).

Autonomous work groups became popular in the seventies and are synonymous with the work organisation experiments of European car manufacturers like Saab, Volvo and Volkswagen. Volkswagen, for example, began experimenting with these groups at its greenfield Salzgitter plant in 1975. Four groups of seven workers were decoupled from the assembly line but had to meet a quota of seven engines per team per day. Each team member was trained to do every job and the group was allowed to regulate job rotation (Jenkins, 1978). Volvo's famous Kalmar plant was opened in 1974 and pioneered the 'dock assembly' process, which involved giving a group of workers responsibility to undertake the final assembly of a whole car. Although this experiment only lasted a few years - the workers found the procedure very stressful - the return to the machine-paced assembly line continued the emphasis on team working, with small groups working along the line on a variety of tasks (Development Council of Sweden, 1984). In 1991, Volvo opened a second plant dedicated to dock assembly at Uddevalla. Teams of between eight and ten car builders took responsibility for the complete final assembly of four cars per shift and were responsible for much of their own training, maintenance, selection and planning. Neither Volvo nor Volkswagen have been particularly successful with these work organisation innovations. In 1978, after a severe union-management struggle over wage levels for the re-skilled workers, Volkswagen abandoned the experiment. Similarly, Volvo's 'worker friendly' plants at Kalmar and Uddevalla were both closed during 1993 due to over-capacity and uncompetitive final assembly speeds.

The US literature on autonomous work groups, or self-managing teams, is more enthusiastic, optimistic and prescriptive (e.g. Orsburn, Moran, Musselwhite and Zenger, 1990; Fisher, 1993; Katzenbach and Smith, 1993). Procter & Gamble is identified as the first major American attempt to implement autonomous work groups (Fisher, 1993; Waterman, 1994). Recounting his personal experience of working at Procter & Gamble's Lima, Ohio soap plant in the early seventies, twelve years after

self-directed work teams had first been set up, Kim Fisher (1993) notes that the "Downy Fabric Softener team averaged 99.9 percent within quality limits, held numerous safety records, and could make, pack, and ship cases of product to our California Downy factory less expensively than what it cost the other factory to get it out to their own loading dock" (1993: 5). Despite their differences, both the US and UK literatures see teams as a new response to increasing competition, the quickening pace of change, more discerning customers, higher employee expectations and a leaner resource base (e.g. Buchanan and McCalman, 1989; Orsburn, Moran, Musselwhite and Zenger, 1990). This tendency to differentiate the earlier team model from something new is apparent in the language of self-managed or self-directed work teams (Kulisch and Banner, 1993), high performance work teams (Buchanan, 1987; Lawler, 1986, 1992) or systems (Rayner, 1993), 'superteams' (Hastings, Bixby and Chaudhry-Lawton, 1994) and empowerment (Ripley and Ripley, 1992).

It might be argued that the current interest in the high performance work team is an example of HRM's tendency to repackage old goods with new designer labels (Legge, 1989). Is the high performance work team really something new and, if so, what distinguishes it from the autonomous work group? To a degree this depends on how we define performance and what we mean by value-added. Successful teams have been around in various guises for many years. Wolff (1991), for example, reflects on the interdisciplinary team at Bell laboratories that invented the transistor in 1948 and was subsequently awarded a Nobel prize for technology in 1956. One of its members, Walter Brattain, could not "overemphasise the rapport of this group. We would meet together to discuss important steps almost on the moment of an afternoon. We would then discuss things freely, one person's remarks suggesting an idea to another. We went to the heart of many things during the existence of this group and always when we got to the place where something had to be done, experimental or theoretical, there was never any question as to who was the

appropriate man in the group to do it" (quoted in Wolff, 1991: 11). On the other hand, teams can also work extremely poorly. Janis' (1971; 1972) well-known phenomenon of groupthink shows how even highly cohesive groups of talented individuals can generate solutions, decisions or plans that are totally inappropriate to the task in hand. For example, "James C. Thomson, Jr., a Harvard historian who spent five years as an observing participant in both the State Department and the White House, tells us that the policy-makers avoided critical discussion of their prior decisions and continually invented new rationalisations so that they could sincerely recommit themselves to defeating the North Vietnamese" (Janis, 1971: 274), rather than reconsidering the disastrous escalation policy. What might be said, therefore, is that while the factors that determine whether a team will be more or less successful are consistent over time, what characterises the recent literature is a focus on *how teams might be designed and managed to increase the likelihood that they will achieve high levels of performance*. "The label 'high performance' may contain a certain amount of 'hype', but it also reflects a major, strategic, shift in emphasis and scope in the practical application of work organisation strategies" (Buchanan and McCalman, 1989: 49).

2.5. Conclusion

How work can be organised to maximise the value-producing capability within the labour process has remained of central importance to Capital since the early days of the Industrial Revolution. Despite the post-modernist tendency to emphasise historical discontinuity and the emergence of post-bureaucratic organisations and institutions, Capital continues to seek the most efficient and effective way to produce and maximise surplus value. Reed (1995) argues that the continued need for an intelligible debate within organisational studies "can only be maintained if the shared sense of long-term historical and intellectual continuities between current concerns and past achievements is retrieved from the selective amnesia or forgetfulness

encouraged by recently fashionable modes of discourse and analysis” (1995: 182). Thus he identifies an emerging research agenda which should examine, for example, the growing sophistication of control techniques within organisations, the process of long-term transitions in organisations, and the putative development of different forms of ‘flexible Fordism’ and “the emphasis that they give to combining flexibility and rigidity within an integrated institutional framework” (Reed, 1995: 179).

Within the UK construction industry, changing customer needs and expectations, on-going recession and the globalisation of the market-place has triggered organisational, managerial and product change in the case-study firm (hereafter referred to as *Conorg*). But although significant, these changes are best understood as part of a continuous process of restructuration played out against a background of prevailing values, attitudes and beliefs, rather than as part of a transition to a post-industrial state. From the 1920s onwards, Conorg pioneered a series of innovations in the UK construction industry which shaped the evolution of both product and labour markets. But, at the level of the labour process, the construction team remains the primary form of work organisation. Although the business necessity to reduce costs has resulted in smaller teams and pressures to combine some hitherto separate tasks, the *essential* team design remains the same as it was in the late sixties. This suggests that it is not automatic that changed markets will impel a changed product market strategy and thereby stimulate changed work organisation (McKinlay and Starkey, 1992: 108). Change processes must be analysed in context (Pettigrew, Ferlie and McKee, 1992: 6-9).

But if intellectual theorising of the sort associated with post-modernism mystifies the process of changing within specific organisational and sectoral life-cycles (Kimberley and Miles, 1980) and deflects us from the search for empirical proof about what is physically happening in organisations (Thompson, 1993: 201), then it is important to disentangle this from the valuable perspectives and insights that emerge from debates

surrounding the efficacy of models such as HRM (e.g. Blyton and Turnbull, 1992; Sisson, 1995), flexible specialisation (e.g. Hirst and Zeitlin, 1989; Pollert, 1991), the new competition perspectives (Abernathy, Clark and Kantrow, 1983; Pettigrew and Whipp, 1991), and even the *excellence* and turnaround literatures (Peters and Waterman, 1982; Kanter, 1983; Goldsmith and Clutterbuck, 1984). There is a compelling need for organisational transformation. Research by Geanuracos and Meiklejohn (1993) concludes that “[a]lmost every survey of company trends indicates that satisfying customer needs is one of the most important external forces for change. Globalisation and deregulation, shorter product cycles and a host of other factors mean that, nowadays, almost no company can afford a totally product-led strategy” (1993: 16). Even a company like 3M which is renowned for its innovation-led strategy recognises that “[i]t used to be that we could afford a certain amount of lost investment on products which didn’t work out in the marketplace. Now the margin for error has shrunk dramatically. We now need to know as much as possible what the customer wants at all stages of development” (quoted in Geanuracos and Meiklejohn, 1993: 17).

The need to link the product and its production to the customer does not imply a change in emphasis from the production of surplus value in the labour process to its realisation in the market. Instead it suggests that there is a need achieve a match, or a fit, between development and consumption. This may be indicative of a new stage in the development of the labour process and one which provides new possibilities for profitability, and for job enrichment or fulfilment. But there is no certainty of this. Evidence from studies of ‘post-Fordist’ forms of work organisation like those at Nissan reveal the co-existence of team working and responsible autonomy with an accumulating experience of work pressure and stress (Garrahan and Stewart, 1989). Despite the operation of a team-based organisation which allows discretion over the deployment of resourcing, together with multi-skilling and a focus on personal improvement, the UK plant of ‘Kay Electronics’ also operates a quality surveillance

system which can monitor individual performance in relation to that of the team (Sewell and Wilkinson, 1992). “In attending work, members are consenting to be subject to a system of surveillance which they know will immediately identify their divergence from norms and automatically trigger sanction or approval” (Sewell and Wilkinson, 1992: 108).

Evidence that organisations are examining the relationship between the creation of value in the labour process and its realisation in the market through customer experience and satisfaction is apparent in the concept and practice of Business Process Re-engineering (BPR). Although its theoretical underpinning appears weak, BPR does make an explicit linkage between business processes and the creation of (more) value for the customer (Hammer, 1994). Hammer and Champy’s (1993) analysis of the ‘crisis’ in late capitalism is reminiscent of that provided by Piore and Sabel (1984). They also reprise the post-bureaucratic condemnation of ‘work specialisation’ and ‘hierarchical control and management’. Taco Bell is presented by Hammer as an example of BPR (Hammer, 1994): a typical Taco Bell restaurant had comprised 70% kitchen area and 30% dining area; the organisation’s value creation strategy focused on maximising the efficiency of its kitchen operations. Taco Bell reversed this ratio by outsourcing food production and thereby doubling its seating capacity (and its turnover), becoming more customer-oriented in the process. According to Zane Leshner, senior Vice President for Taco Bell Operations, “it started with a proposition: what could we do to eliminate the cumbersome slicing, dicing production process that, importantly, the customer placed no value on?”. Because “[a]t the end of the day the customer pays for everything, both the product and fulfilling the order” (Hammer, 1994), business processes should be examined to identify those tasks and activities that add value and those that are superfluous. Moreover, tasks should wherever possible be integrated to avoid ‘handovers’ in the transmission of work from customer order through to order fulfilment. Although this

can lead to job enrichment through multi-skilling, it can just as easily result in work intensification, down-sizing and de-skilling (Thomas, 1994).

The role of work design in 'downstream' manufacturing and service operations is increasingly to develop commitment while maintaining operating control (Klein, 1994). But in 'upstream' operations such as new product development or project-based management, where the task is characterised by extreme variability in technology, supply, market conditions, perceptions, expectations, goals, resources and complex interdependencies (Buchanan and Boddy, 1992), control in the traditional sense is less relevant. Although it is possible to apply common techniques to projects, every project is different. Project teams are created to develop and implement a unique solution, often within prescribed time, budget and quality parameters. Such teams must reconcile the need for creativity, problem-solving and innovation with efficiency, but they are seldom designed in a way which enables them to achieve outstanding levels of performance or added value. There is an opportunity for design principles to be applied to the team formation process at the interface between the award of an order and the process of its fulfilment.

In conclusion, this chapter has discussed the evolution of work design as a quasi-managerial strategy for maximising profit. It has been argued that alternative models of work organisation design are a consequence of strategic choices based on product market and other conditions. At a macro-level, human resource management has emerged as a framework for interpreting and managing the complex information flows between customers, product market strategies and forms of work organisation. At a micro-level, work organisation design is identified as the principal lever by which the firm can articulate product market and labour process. It is hypothesised that the application of design to the team formation process can create conditions in which teams become high performance work systems and that this may help to differentiate the 'new' teams from earlier models. The next chapter will identify the

factors that predict high performance in a project team environment. It will focus particularly on the relationship between *work design* levers (inputs), team processes and performance outcomes (outputs), particularly customer satisfaction. In so doing, it will begin to develop a model from which to identify the factors within an increasingly influential team labour process model which impact on the realisation of value in the market in terms of customer satisfaction.

3.0. A MODEL OF HIGH PERFORMANCE TEAM WORK DESIGN

3.1. Introduction

Chapter two presented a consideration of work organisation design from several perspectives. This included the relationship between work organisation design and (1) management strategy, ideology and choice, (2) patterns of continuity and change in different industrial sectors, and (3) the creation of value in the labour process and its realisation in the market as profit. Although we must beware of historical determinism in our analysis of socio-economic and organisational change, and also to avoid some of the limitations of open-systems theory (Morgan, 1986: 74-76), the intensification of industrial competition does seem to require organisations to align their value creation capabilities more closely to customer requirements and expectations. Because high performance is defined by the customer, not the supplier, work organisation must facilitate the creation or delivery of outputs that are valued by customers. At a practical level, this means that work design choices must generate processes, activities and behaviours which add value for the customer. If the customer need has been effectively defined and simulated 'upstream', 'downstream' manufacturing of the product may take place within a relatively controlled, prescribed and stable labour process environment. Even in the retail sector, where customer-supplier relationships are physically close, good customer service does not necessarily equate with a more fulfilling work experience for the employee at the check-out. But where the need is more difficult to articulate and value to the customer can be added through intellectual processes, low employee control may inhibit people's natural enthusiasm and capacity for creativity, innovation and problem solving.

Despite the potential for differing degrees of worker empowerment between the two poles of control and commitment, many organisations are experimenting with team-based work designs in an effort to utilise their workforces more effectively (Peters and Waterman, 1982). This is because it is assumed - perhaps optimistically - that

teams are more flexible, innovative and productive than traditional 'scientific' or mechanistic work organisation designs based on task specialization and management control. At Sun Microsystems in the United States, for example, eight generations of new products have been introduced in nine-and-a-half years and this has only been possible by dissolving the functional barriers between different specialisms (Rayner, 1993: 35). The re-structuring of the organisation to generate employee creativity and innovation as a core business process is clearly different to the application of team working in the auto industry where prescribed work easily outweighs discretionary work. According to Wickens (1993), [i]f we are to achieve long-term high quality, we need to combine two elements - commitment of the workforce and control of the process" (1993: 86).

Fisher (1993) discusses the application of concepts and approaches developed in the auto industry to the "fragmented UK construction industry", notably lean manufacturing, flexible manufacturing (including Just-in-Time inventory systems), knowledge-based engineering and quality function deployment. Although the theme of his paper is "*systems produce consistency and reliability, people produce innovation and value*", he focuses on the systemisation of component manufacture off-site and its assembly on-site. It seems unlikely that 'manufacturing' teams on-site will exercise significant control over the assembly process and that this will be accompanied by further de-skilling at craft level in the industry. In contrast, the performance of upstream activities will be enhanced by more effective intellectual team working between the diverse members of the professional design team, such as architects, project managers and engineers.

Organisations can choose how to design their labour processes, but this choice is based on management assumptions about work, workers and the nature of organisations (Guest, 1992). Research by Guest and Dewe (1991) suggests that beliefs based on differences of interest between managers and managed still persist.

Guest also notes how “the potential for applying human resource management to obtain a more committed workforce” is constrained by (1) “the unenthusiastic response of a workforce reluctant to display commitment to the organisation”, (2) workforce suspicion of management’s motives, (3) “ingrained assumptions of managers at all levels about workers and how best to manage them”, and (4) “lack of clarity about the steps necessary to obtain a committed workforce” (Guest, 1992: 114-115). The co-existence of ‘new participative plants’ (Lawler, 1978; 1990) such as those experimented with by Volvo, Saturn, Procter and Gamble and Digital with the ‘Kay Electronics’ example mentioned in chapter one and the trend towards the ‘black hole’ model of workforce management which de-emphasises HRM approaches (Guest, 1995), is indicative of the range of design alternatives open to organisations. But, the question remains, which of these approaches is more effective in terms of the quality and quantity of value added to work processes and under what conditions?

Inevitably, there is no one answer to this question. It depends on the task, on the history and structure of the social relations of production, on existing technologies, and on the nature of product market competition and the expectations of the customer. We have seen how the contemporary economic environment is characterised by intense competition and that this has required organisations to become more fluid and adaptable, able to combine innovation with productivity and customer service. The challenge for the organisation is how to create a work environment in which individuals and teams are willing and able to create value. How, in an environment of constant change, can work be designed to integrate the value creation and realisation processes? What are the critical determinants of customer satisfaction and organisational performance? How can work organisation, as a broad term which encompasses organisational context, structure, work content and process, be designed or re-designed to improve organisational capability? Moreover, what role can work organisation design play in the increasing population of organisations whose core business is the project management of prototypes or

'one-off' products? And, finally, what is the relationship between work organisation design, team performance processes, customer satisfaction and employee job satisfaction?

In order to explore these questions, this chapter will develop an open-systems model of high performance work design which draws on the themes identified in chapter one and summarised above. In particular, it will consider:

1. open systems models of team performance;
2. financial and non-financial indicators of organisational performance
3. the impact of group processes (such as cohesiveness and constructive controversy) on organisational performance
4. the identification of key 'enablers' or design levers which are predicted to influence both group processes and organisational performance.

These factors will be used to develop a taxonomy of high performance team work which will inform this study's research design as a preamble to empirical verification. Essentially, the aim is to develop and test a model of team work design.

3.2. Open Systems Models Of Team Performance

The proliferation of the literature on teams since the 1970s, which itself was built on an already voluminous small groups literature (e.g. Homans, 1951; Trist and Bamforth, 1951; Likert, 1961; Roethlisberger and Dickson, 1964), has produced many general models of team performance with varying degrees of quality and rigour. While some of these models are based on sound theoretical propositions (e.g. Neiva, Fleishman and Rieck, 1978; Kolodny and Kiggundu, 1980; Hackman, 1983; Guzzo, 1986; Tjosvold, 1991), there are very few that have been formally tested using a large sample of performing teams. Research by Gladstein (1984) and Bursic (1992) involving the testing of a model of team performance with work-based teams remains the exception, rather than the rule. In the field of construction project

management, only two models of project team performance have been found (Thamhain, 1991; Tampoe and Thurloway, 1993), but these also require empirical examination.

There is much empirical evidence on the effect of specific variables on team performance (e.g. Tziner and Eden, 1985; Katz, 1982; Fry and Slocum, 1982) and some of this will be reviewed later in the chapter. Despite the widespread interest in teams and their increasing application in industry, therefore, there are very few multiple variable or system models which give an insight into the complex relationships that exist in the real world (Goodman, 1990). This may be due to methodological and epistemological problems, such as difficulty in gaining access to team-based organisations, or lack of a clear theoretical conceptualisation. This section will consider a selective sample of the more robust of the available open systems models as a preamble to the construction of a multiple variable model of project team performance.

Each of the models shares a common grounding in open systems theory (Bertalanffy, 1960). Open systems theory focuses on three key issues (Morgan, 1986). Firstly, that organisations must interact with their environment in order to survive. This environment usually refers to the 'task environment' of competitors and customers. Secondly, that organisations and organisational performance should be defined in terms of their interrelated sub-systems. Thus the performance of an organisation can be determined by key patterns and interconnections between subsystems such as technology, structure, human-cultural and strategy (Kast and Rosenzweig, 1973). And thirdly, that an objective should be to identify congruencies between different systems and to eliminate potential dysfunctions. This is evident in socio-technical systems theory which seeks the best fit between the social and technical components of a work organisation system (Trist and Bamforth, 1951).

Kolodny and Kiggundu's (1980) empirical study of eight Canadian mechanical harvesting groups draws directly from socio-technical systems theory. Their model identifies the interplay between leader behaviour, member technical competency and group interaction as primary determinants of group performance. These variables are both influenced and moderated by externally imposed conditions such as organisational arrangements (combination of men and machines, the reward system, etc.), task conditions and group characteristics. Their research found that the different performances of the groups could be explained by the variability in the joint social and technical optimisation of the working environment. A quote from one group supervisor is symptomatic of their approach: "Layout and trained people or, in other words, the efficiency part of it can get you up to 800 cords per week. After that the group effort will make the difference" (Kolodny and Kiggundu, 1980: 642). The higher performing groups were visibly more cohesive than the lower performing groups and this factor was significant when the groups experienced unfavourable task conditions (e.g. changing physical and atmospheric conditions).

Shea and Guzzo (1984; 1987) and Guzzo (1986) identify three predictors of group effectiveness: task interdependence, outcome interdependence and potency (1986: 47). Task interdependence refers to the extent to which the task requires co-operation and interaction among group members. Outcome interdependence refers to the existence of consequences that are shared among group members. "When outcomes contingent upon group performance are distributed to group members equally, each member has an incentive to produce. When such outcomes are distributed competitively, however, each member has an incentive not only to produce, but also to excel the level of performance of fellow workers in order to obtain the larger share of the competitively distributed reward" (Shea and Guzzo, 1987: 334) This can lead to behaviours which are inconsistent with effective group working such as blocking (Miller and Hamblin, 1963). Potency refers to the existence of a collective self-belief among group members that it can yield an effective performance. The development

of norms about what the group believes it can or cannot achieve is influenced by perceptions by members of the combined ability within the group, together with the support provided by the team leader and other authority figures, and the availability of adequate intellectual and physical resources (such as member competence, information) to complete the task. These three factors - task interdependence, outcome interdependence and potency - interrelate and are affected by the group's environment.

Shea and Guzzo's (1987) model of group effectiveness is interesting for two reasons. Firstly, the model does not emphasise process as a determinant of group effectiveness. "Social interaction and exchange among members are not postulated to impact task accomplishment" (1987: 336). Instead, they argue that effectiveness is related to the group's charter or objectives. And secondly, the model emphasise practical explanatory variables which can be directly influenced by organisations. For example, outcome interdependence can be managed through the reward system; potency can be affected through feedback mechanisms as well as training and development interventions, while task interdependence can be enshrined in a group charter or mission. The role of (1) HRM policies and practices in creating a context for high levels of group performance is therefore significant in this model and (2) group design as a managed process are both therefore identified as important components in the development of a model of high performance team work.

In contrast to the approach of Shea and Guzzo, Deborah Gladstein's (1984) model of task group effectiveness attempts to determine whether or not task and maintenance (or process) behaviours such as good decision-making, low interpersonal conflict and supportiveness, account for any of the variance in group effectiveness when group composition, group structure, and organisation factors are also considered. Her model is different from earlier models because it seeks to identify intermediate criteria of group effectiveness which can moderate the group's ultimate performance.

Her survey of 326 individuals represented 100 intact task groups from the marketing division of an organisation in the communications industry. Data was collected from a questionnaire sent to all team members and from records of actual sales revenue. The questionnaire included items measuring each of the process and structure variables as well as a self reported measure of effectiveness. Her results showed strong linkage between open communication, supportiveness, active leadership, training and organisational tenure and *self-reported* effectiveness and job satisfaction, but little or no evidence of a relationship between these variables and *actual* sales. The effect of group structure on group process, however, was supported.

Gladstein concludes that "there is limited support for the structure-process-effectiveness relationships" (1984: 511). She suggests that one reason for the contrast between self-reported measures of effectiveness and actual sales revenue is that knowledge of performance data leads members to assign an entire set of characteristics to groups (Staw, 1975). Group members create an implicit theory about the factors that they believe *should* be present in high performing teams, rather than the factors that are actually affecting performance. "Group members were attributing sales to their own interaction and experience, when it was market growth, low experience levels, and other unidentified variables that were determining sales revenue" (Gladstein, 1984: 512). The implication is that existing paradigms about the sacrosanct relationship between *good* team working and high performance - often perpetuated by researchers who themselves define group effectiveness as partly a consequence of healthy social interaction - are preventing the development of new theories about the factors which actually determine performance in different work organisation environments.

A model by two McKinsey consultants, Katzenbach and Smith, is included in this review because it is representative of the popular management genre (1993a; 1993b). The authors indirectly support Gladstein's conclusions by arguing that "teamwork

values by themselves are not exclusive to teams, nor are they enough to ensure team performance" (1993a: 112). Instead of devoting time to building teamwork values, the team leader should focus on defining the team's performance challenge. Once this is articulated the team will coalesce around a unifying purpose which will nurture appropriate team processes such as communication and constructive conflict. Katzenbach and Smith use the experience of real teams with different challenges in a variety of contexts to support their thesis. High performing teams are those that have a clear vision and which break specific and measurable performance objectives out of this vision. For example, the 'Zebra' team's vision which is to lead "broad-scale corporate change throughout Kodak, building values of partnership and risk taking, and proving the worth of black and white film at Kodak" (Katzenbach and Smith, 1993b: 51-52) is achieved through clear performance objectives aimed at "increasing profits, reducing cycle-time along with work-in-progress inventory, cutting production costs, increasing customer satisfaction, and improving on-time deliveries" (ibid: 52).

Katzenbach and Smith's model therefore focuses less on the importance of team processes and more on the application of what they call 'team basics'. Their model has three outcomes: performance results, collective work products and personal growth. These can be achieved by applying appropriate skills, mutual accountability and commitment to purpose. The management of team skills is a *design* issue addressed through the selection and development of team members, whereas the creation of a *climate* of accountability and commitment within the team flows directly from the definition of the performance challenge. When the team has this its members can begin to specify roles, decision-making processes and work schedules. By comparison, team members who are responsible for managing the execution of construction projects are often excluded from involvement in the project definition/acquisition phase during which time the performance challenge is defined. Existing functional or specialist roles tend to determine the subsequent organisation

of work roles on the project. This demarcation of roles responsible for the conception and execution of many projects is a factor which can work against the development of commitment to a common purpose and mutual accountability. Katzenbach and Smith refer to the formation of an implicit social contract that "relates to their purpose and guides and obligates how [team members] must work together" (1993a: 116). The nature of the social contract - essentially the group norms that regulate task performance behaviour - is strongly related to the team's opportunity to take ownership of the project or task that it is working on.

The model of team basics contributes to our understanding of high performance team design because it suggests that real teams do not just emerge (Katzenbach and Smith, 1993b: 109). Direct intervention in the early stages of the team's formation process is necessary. Eight alternative interventions are paraphrased from Katzenbach and Smith's work below:

1. Establish urgency and direction, which is a team leadership function.
2. Select members based on skills and skill potential, not personalities, and nor, by implication, availability.
3. Pay particular attention to first meetings and actions, when performance norms are established.
4. Set clear and agreed rules of behaviour. In other words, "what must always be done in this team" and "what must never be done in this team".
5. Set performance-oriented tasks and goals in the early stages of the team's project which can be used by team members as reference points for how the task should be performed in the future.
6. Challenge the group regularly with fresh acts and information, as a counter to complacency and group-think.
7. Spend lots of time together, avoiding the creation of physical and social barriers between team members.

8. Exploit the power of positive feedback, recognition, and reward, to reinforce desired behaviours and encourage contributions (adapted from Katzenbach and Smith, 1993b: 119-129).

The most influential model of group effectiveness has been developed by Hackman in a series of ground-breaking books and papers (Hackman and Morris, 1975; Hackman, 1978; Hackman and Oldham, 1980; Hackman, 1983; Hackman and Walton, 1986; Hackman, 1987; Hackman, 1990; Hackman, 1992; Hackman forthcoming). Hackman's analysis begins with a definition of group performance. He identifies three dimensions of group effectiveness: the level of organisational or customer satisfaction with the quality, quantity and timeliness of the group's output; whether or not the process of working together enhances the capability of team members to work together on future tasks; and the extent to which the group experience is satisfying and contributes to the personal development and growth of team members (Hackman and Walton, 1986: 78-79). As a corollary, Hackman adds that the relative weighting of these three outcomes will depend upon why the group was set up in the first place and that, in many cases, the second and third dimensions will be by-products of the first. He is also careful not to oversimplify the problem of measuring group effectiveness. Objective and comparable measures of performance are rare, and the perceived success or failure of a team often depends on the subjective assessments of customers and others.

Having identified these outputs, Hackman then works backwards to identify the conditions that are most closely associated with effectiveness, and then determines how groups can be set up, or designed, to satisfy these conditions. He first specifies three intermediate criteria of team effectiveness which relate to the ultimate performance of the group. These are the level of effort that group members bring to bear on the task, the amount of knowledge and skill applied by group members to the task, and the appropriateness of task performance strategies used by the group

(Hackman, 1983). If it was possible to control these process criteria group effectiveness could be guaranteed. But because the group's skill, effort and task performance strategy cannot be manipulated directly, it is necessary to create the enabling performance conditions which favour the achievement of these intermediate criteria of effectiveness (Hackman, 1990). A summary of the points of leverage for creating these conditions is shown below in figure 3.1.

<i>Process Criteria of Effectiveness</i>	<i>Points of Leverage</i>		
	<i>Group Structure</i>	<i>Organisational Context</i>	<i>Coaching and Consultation</i>
Ample Effort	Motivational structure of group task	Organisational reward system	Remedying co-ordination problems and building group commitment
Sufficient knowledge and skill	Group composition	Organisational education system	Remedying inappropriate "weighting" of member inputs and fostering cross-training
Task-appropriate performance strategies	Group norms that regulate member behaviour and foster scanning and planning	Organisational information system	Remedying implementation problems and fostering creativity in strategy development

Figure 3.1: Points of Leverage for Creating Conditions that Enhance Group Task Performance (Hackman, 1990: 13).

The implication of this model is that the group structure, organisational context, or an aspect of process assistance can be manipulated to redress shortfalls in the process criteria of effectiveness. For example, for knowledge and skill-related issues, leverage may be applied through changes in group membership, training and education, or the dynamics involved in how members learn from each other. But as well as these performance enabling conditions, Hackman also emphasises the importance of two other factors. Like Katzenbach and Smith (1993), Hackman stresses the role of a *clear, engaging direction* as a prerequisite to group effectiveness. Again the purpose of the vision is to provide a framework within which the team can develop its own specific performance objectives. And secondly,

he identifies the availability of *adequate material resources* to allow the team to achieve its task. The author has personally witnessed a *Conorg* construction team in Moscow that could not send tender documents to its works contractors because it was without photocopying facilities, and was frequently unable to communicate outside the project because of a temperamental telephone system. "Indeed, among the saddest kinds of failures are those experienced by well-designed and well-supported groups with a clear sense of direction but who cannot obtain the resources they need to fulfil their promise" (Hackman and Walton, 1986: 87).

Using this conceptual framework, Hackman and 15 colleagues studied 27 diverse groups (1990). Although confirming the basic tenets of the model, the research also identified four crosscutting themes and issues that were not anticipated. Time limits, particularly for task forces, and cycles of activity for other types of group, had a powerful organising influence, determining the pace and rhythm of the work. This, in turn, helped to form the group climate and shape the quality of member experiences (Hackman, 1990: 481). A second theme was that groups that started well seemed to get better, while the opposite was true for groups that had difficult beginnings. Two causes of this phenomenon are suggested: the quality of the group's initial design and the occurrence of either favourable or unfavourable events which fuels the upward or downward spiral. The labelling of teams as good or bad following critical early events, coupled with the ensuing positive or negative feedback, can create a self-fulfilling prophecy, as team members accept the validity of their labels. A third theme related to the amount of authority held by the group. Most groups, when formed, have the authority to manage their own internal work processes and this authority increases as the team matures. Interventions by external authority figures, however, can have detrimental effects on group process, unless they occur either at the start of the team's life or at a natural breakpoint (Gersick, 1990). Problems can arise when an intervention occurs in an aspect of the work which is the province of the group itself. For example, a dominant metaphor in *Conorg* is that of

the 'corporate seagull' who 'flies' into the project team, criticises some (usually technical) aspect of the team's work, and then 'flies' out again (Webb, 1991). Often the problem is caused by the *laissez faire* attitude of external authority figures who fail to give the team on-going process assistance. The final crosscutting theme concerns the content of the work, or the *stuff* with which the team works (Hackman, 1990: 487). "Over time, the values of group members appear to become increasingly aligned with the materials a group works with" (ibid: 488). Flying a plane, treating a patient, preparing a report, or constructing an airport terminal are substantively different tasks which affect the nature of the team's intrinsic performance processes. It is argued that the team's interaction with the *technology* of its task can become so significant that the team loses sight of the larger social system of which it forms a part.

The open systems models presented above are powerful because they attempt to link the performance of groups to their root causes in a predictive way. But they do have their limitations in several respects. Firstly, as we have seen, the models have proven difficult to test and, more especially, to re-test. Secondly, while some of the models identify critical predictor variables, for example, Hackman's *clear, engaging direction*, we do not know which of the variables are the most important predictors of group effectiveness, if indeed any single factor does have a particularly significant effect. Thirdly, in attempting to be generic, the models do not specify the circumstances in which certain variables are likely to be critical. For example, do the same variables cause the team to simultaneously overcome complexity, achieve high levels of productivity and satisfy customer expectations? And are the same predictor variables equally important to temporary project teams as they are to factory production teams or top management teams? Fourthly, what is the role of leadership in the group environment given the shift to self-managing teams? Many of the models identify leadership as a critical variable but few (e.g. Walton and Hackman, 1986; Manz and Sims, 1987) specify the key behaviours which facilitate effective

team processes. And finally, the direction of the relationships in the existing models may be problematical. In most of the models group process is viewed as an outcome of structure, context and process assistance, but this fails to recognise the synergistic interaction within teams that may affect, for example, leader behaviour and the development of group norms.

Tjosvold (1991) integrates research on the components of group effectiveness (for example, composition, cohesiveness) and general models of group effectiveness (e.g. Gladstein, 1984; Gist, Locke and Taylor, 1987) into his own conceptual model of team organisation. His model "*uses group research to develop a comprehensive framework to managing and leading in an organisation*". It develops a straightforward, powerful model that simultaneously identifies the nature of productive teams and how to create them" (Tjosvold, 1991: xii). Tjosvold does not specify causal relationships between predictor variables and team outcomes, but instead presents a *holistic* model of team organisation which is based on the perceptions, skills and behaviours that promote teamwork (Tjosvold, 1991: 243). The five elements of his model are envisioning, uniting, empowering, exploring and reflecting. The *envisioning* dimension is common to most team models and refers to the creation of a compelling vision that is realistic, challenging, significant, shared and which has personal meaning for team members. Forging *unity* behind cooperative goals involves structuring tasks to create interdependence, rewarding and recognising the team as a whole for its achievements rather than the individual, assigning complementary roles, distributing resources equally among team members, and creating a feeling of community within the team based on trust and commitment. In order to act, the team must be *empowered* by the parent organisation, but it must also want to be empowered. Although empowerment is a voluntary activity closely related to enthusiasm and intreprenurialism (Hogg, 1992: 72), it is more likely to emerge if team members believe they have the skills and resources to achieve their task, and the psychological confidence to do it (Tjosvold, 1991: 153). But vision,

unity and empowerment are not enough to guarantee high performance. The team must generate high quality, creative solutions to problems and then reach acceptable and workable decisions. This involves *exploring* issues and ideas from opposing perspectives without fear of damaging the team's social structure. Tjosvold refers to this as constructive controversy which is the process of elaborating views, searching for new information and ideas and integrating opposing positions (Tjosvold, 1985). He suggests several design strategies which support this remedy to group-think (Janis, 1972) and process loss (Steiner, 1972). These include selection to achieve a heterogeneous group membership, establishment of openness norms, fostering participation and the protection of individual rights. The final element of the model is reflection, which involves the team reviewing its performance and development on a continuous basis. This is important because it prevents stagnation and stimulates team growth and improvement.

The models presented above all confirm, either directly or indirectly, the important role that design has in increasing the likelihood that teams will achieve high levels of operating performance and member satisfaction and development. By hypothesising system linkages between aspects of process, structure, context and group effectiveness each model suggests that leverage can be applied to change the *ecology* (Handy, 1992) of the team environment and thereby to influence the task performance behaviour of team members. There are several themes in the existing literature which contribute to the development of an empirical theory. Firstly, the research design should attempt to be both fine-grained and general, including as many endogenous and exogenous variable constructs as possible. This makes possible an analysis of the relationship between, for example, a clear, engaging direction and shared objectives, without sacrificing the advantages of nomothetic science (McGrath, 1986). Secondly, the theory should be sensitive to the possibility of multi-directional relationships. This means that we must not overlook the possibility that enabling factors such as leadership style and group norms can be

influenced as well as being influencing. Thirdly, sufficient attention must be given to the context that the team finds itself in. The efficacy of the construction project team's performance strategies will be contingent upon the complexity of its task and environment. Fourthly, the research model must be conceptually clear and the linkage between the concepts and their measures both explicit and appropriate. Wherever possible, the research model should leave the door open for other researchers who may wish to repeat the methodology in a different team context. And finally, the research must try to identify the variables that have the greatest explanatory effect on team performance and discuss under what conditions these variables are more or less potent.

The next section of this chapter will review the various dimensions of the models of group effectiveness which are considered appropriate to the development of a taxonomy of project team design. The section will follow the design-process-outcome approach adopted by, for example, Gladstein (1984), and will identify the principal variables within each element in turn. It is important to recognise, however, that there is an implicit divergence of approach in the models concerning the usefulness of process in small group research. The five elements of Tjosvold's (1991) model, for example, emphasise group process, or 'working as a team' in creating conditions for group effectiveness. The object is to forge synergy (Tjosvold, 1991: 229-232) so that team members are "united in a common vision and direction, empowered to collaborate, exploring their common issues and problems, and celebrating their achievements" (ibid: 229). Although not tested empirically, Tjosvold's conceptual model was highly influential in the development and validation of the Team Climate Inventory (Anderson and West, 1992; see below). In contrast, we have noted how Shea and Guzzo's (1987) model consciously omits process as a determinant of group effectiveness and this supports Hackman and Walton's (1986) position that "there are many different ways a group can behave and still perform well, and even more ways to be non-productive" (1986: 80). The open-

systems principle of *equifinality* captures the idea that there may be many different ways of arriving at a given end-state (Katz and Kahn, 1978). This study will explore the strength of these alternative positions by including both enabling and process variables in the model of high performance team design.

3.3. Building a Model of High Performance Team Work Design

The main part of this chapter will use the existing literature to develop a model of high performance team work design. Inevitably, the use of the literature and the choice of variables to be included in the model will be influenced by several factors, including (1) the type of teams employed in *Conorg*, (2) the author's assumptions about which factors are more or less important to team performance in *Conorg*, and (3) the conceptual arguments developed in chapter two. The last point is easily dealt with. The rejection of the Marxist idea that the role of management is primarily to reduce both labour's costs and capital's dependence upon labour in the production process in favour of an approach which recognises that management's actions are conditioned by the complex interplay of changes in product and labour markets and technology (Knights and Willmott, 1986), leads us to use an open-systems model from which to examine the relationship between customers and labour process design (and redesign strategies) as part of an integrated framework. The first two points are more problematic, however, and will be more fully discussed in the next chapter. It is, though, necessary to make some general comments about *Conorg* teams at this juncture.

First of all, teams in *Conorg* are construction project teams. Before discussing the team, it is necessary to define what is meant by a project and, specifically, a construction project. A project has been defined as the "[c]ombination of human and non-human resources pulled together in a temporary organisation to achieve a specific purpose" (Pinto and Slevin,). Projects possess four characteristics: they

have a defined beginning and end, a specific goal or set of goals, a series of complex or interrelated activities and a limited budget. A definition of a construction project is “[t]he planning, control and co-ordination of a project from conception to completion (including commissioning) on behalf of a client. It is concerned with the identification of the client’s objectives in terms of utility, function, quality, time and cost, and the establishment of relationships between resources. The integration, monitoring and control of the contributors to the project and their output, and the evaluation and selection of alternatives in pursuit of the client’s satisfaction with the project outcome are fundamental aspects of construction project management” (Walker, 1989: 5). Although ‘resources’ includes people as well as materials, equipment and funds, the human dimension is often missing from definitions which focus on the technical achievement of the project.

Construction projects are organised into, and managed by, different types of teams, but these can be classified into three relatively distinct groups. The first group is the group that produces and communicates information. This includes the architects and engineers who prepare the drawings for the project and who provide specialist advice. This group can also include the client and the client’s project manager, together with the quantity surveyor who is responsible for managing the client’s budget for the project. The second group is that which produces the end product. This is the group that consists of the many teams of works contractors who are selected by competitive tender. These teams bring specialised skills in, for example, cladding, structural steelwork, painting, television surveillance systems, sewage treatment plants and the many other kinds of work which make up the construction industry (Bennett, 1985). The final group is the group with which we are concerned: the team responsible for the management of the construction process. Although there are different client procurement routes which create different relationships between the three groupings (CSSC, 1991), the key role of the construction project management team is to

manage the conversion of the design information into the construction (or manufacture) of the finished product.

In terms of the polarisation of the possibilities for 'expert' and 'non-expert' teams in terms of self-organisation and self-management, the upstream design activities depend on individual and collective creativity and innovation, while the downstream activities of manufacturing and production are prone to a mixture of routinisation and artisanal skill, and control and autonomy (depending upon the technology employed). For example, the amount of bricks laid in a given time period is more easily specified and monitored than the installation of a computerised building management system. The role of the construction project management (CPM) team has traditionally been to co-ordinate the production process so that the client's time, cost and quality objectives are achieved. CPM teams consist of professionals from a variety of specialisms including, for example, construction management, quantity surveying and engineering. CPM itself is representative of a technocratic form of management control because it involves the technical management or administration of the construction process by experts using expert systems.

The complexity of the construction process makes the need to apply sophisticated project management systems together with copious amounts of creativity, problem solving and learning to the management of that process critical to a successful outcome. There is little doubt that the fragmentation of the UK construction industry has resulted in excessive over-capacity and under-performance which the recent spate of innovations in organisation, technology and management has done little to address (Latham, 1994). The scope of this study cannot encompass what is essentially an industry-wide problem. What it can do is to investigate how the CPM team might better be designed to increase its own performance and therefore the satisfaction of the project's client. Although it is feasible that *high performance design principles* might be extended to the management of the construction process as a whole, in the

current circumstances this would probably be undermined by the problem of fragmentation. This study is therefore concerned with the specification and creation of conditions for high performance team work within the CPM team. In particular it seeks to investigate how HRM can contribute to the attainment of high levels of performance in an environment which relies on ‘hard’ control technologies (e.g. work breakdown structures, time estimates, network diagrams, etc.). It recognises that these procedures are necessary in applying order and predictability to a process dominated by change. However, it also recognises the centrality of the people dimension to successful construction project management (Kliem and Ludin, 1992).

The organisation of the next part of this chapter will develop a model of high performance team design which is relevant to the construction project management environment. Its structure will adopt the open systems approach discussed above and utilised by both HRM researchers (e.g. Guest, 1987) and group researchers (e.g. Hackman, 1987) who seek empirical verification of their theories (e.g. Guest and Peccei, 1993; Hackman, 1990). A simple open-systems model is shown in figure 3.2. below:

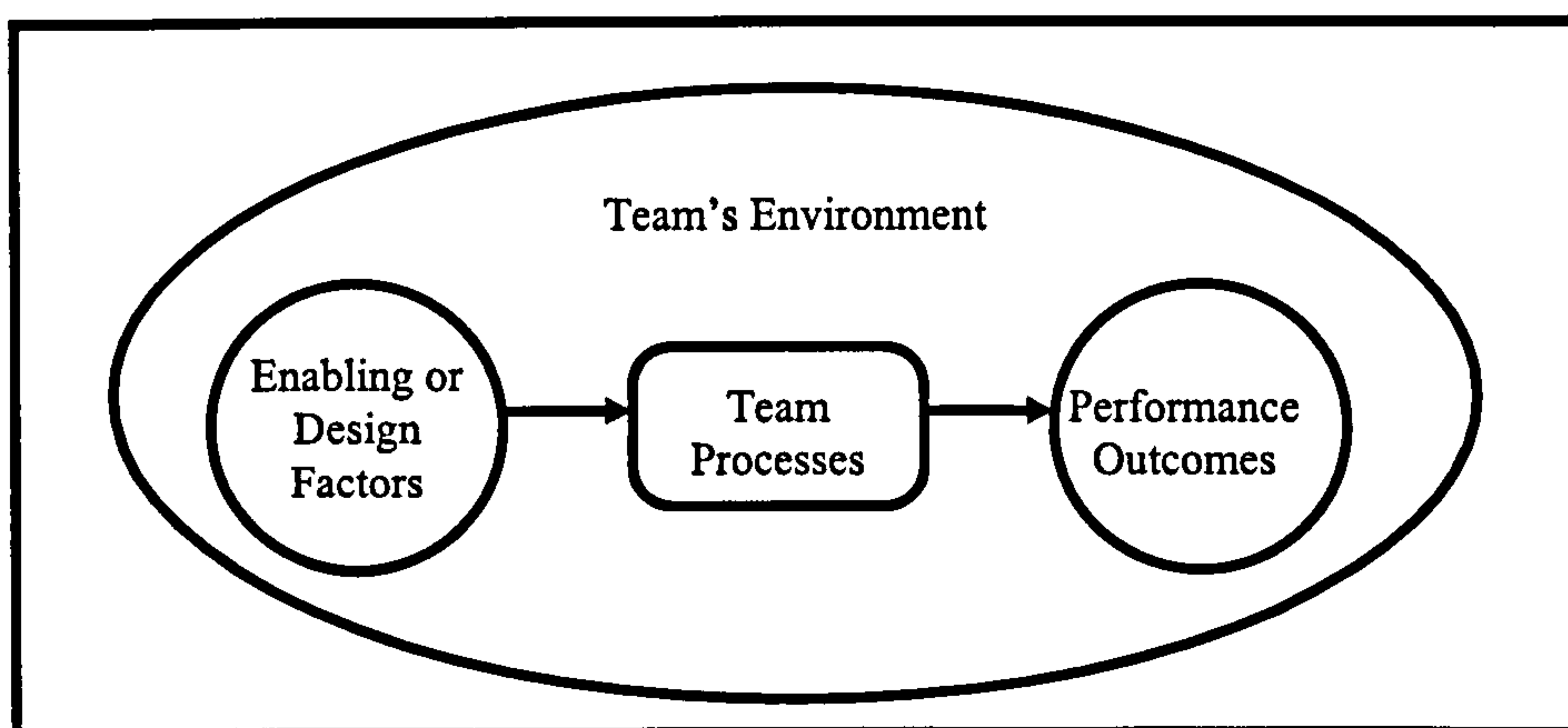


Figure 3.2: Simple Open Systems Model of the Determinants of Team Performance.

The construction project management environment is highly complex and turbulent and possible confounding variables will be discussed in the next chapter. The second

half of this chapter will focus on the three groups of variables identified in the model, beginning with performance outcomes, followed by team processes and concluding with the enabling or design factors.

3.3.1. Team Performance Outcomes

Conventional outcome indicators emphasise financial performance as the principal measure of organisational success. Cash flows, capital expenditures and other costs, sales volumes, price and fee levels, profit levels, assets and liabilities including borrowing and other funding requirements are popular indicators because they help to establish whether business strategies “will produce financial performance acceptable to shareholders and creditors in terms of both risk and reward levels” (Stacey 1993: 39). But there are increasing trends in contemporary organisations away from traditional, financial measures of performance to measures which are more sensitive to changes in customer and employee perceptions and expectations. A recent Business Intelligence survey indicated that 88 per cent of respondents were unhappy with their company's performance measures because they were too financially oriented (63%), not related to individual performance (42%), too short term (36%), or too vague (34%) (Geanuracos and Meiklejohn, 1993: 2). Baden-Fuller and Stopford's (1992) study of businesses who have achieved business turnaround (‘de-maturity’) found that “our rejuvenators progressed by adding more externally focused measures, many of them involving non-financial items and many based on team performance, not that of individuals” (1992: 194). They compare typical 1970s performance measures with a new set of measures that are gaining in currency.

Performance Measure	1970s	1990s
<i>Focus</i>	Efficiency	Effectiveness Customer delight
<i>Purpose</i>	Control	Control Monitor Improve
<i>Number</i>	Few	Many
<i>Bias</i>	Internal	Internal and External
<i>Developed by</i>	Top management	Management/employees
<i>Level</i>	Individual	Team

Figure 3.3: Changes in Organisational Control and Measurement Systems (Baden-Fuller and Stopford, 1992: 195)

The key difference in this approach is between measures of efficiency and measures of effectiveness. Efficiency can be defined as the ratio of output to input and is therefore concerned with the use and abuse of resources (time, cost, people). An efficient process, however, can be ineffective if it is misapplied or redundant (Hammer, 1994). Carnall (1992) considers effectiveness to be a function of efficiency and adaptability (1992: 71). With a relatively stable and homogenous market for its products, the auto industry's competitive strategy was based on production efficiency and cost-reduction. In a more turbulent environment, however, survival is based on the ability to predict and simulate *future* customer product expectations (Clark and Fujimoto, 1992: 23). But because, as we have seen, matching product development to customer requirements is a complex and iterative process, production technology and work organisation must be flexible and responsive. Measures of business performance should therefore focus on staff flexibility, management style and customer experience, as well as market share, profits and overheads.

Developing this theme, Reicheld and Markey (1992) suggest that "most business people, without knowing it, see the world through the lenses of manufacturing goggles... Today's accounting systems - the measuring framework which defines corporate reality and focuses organisational energy - have changed little since they were developed to meet the learning requirements of nineteenth century steel and textile manufacturers" (1992:1). The new industrial competition obliges firms to recognise that their most important asset is the commitment and enthusiasm of their customers and employees. This change from *measuring what is produced to what is valued* reflects a corresponding shift from a functional to a process view of the firm. The functional paradigm is attributable to the influence of the division of labour and the bureaucratic organisation. At the extreme this creates a set of highly differentiated specialist functions all reporting upwards to a senior management group. By contrast, the process paradigm links employees, functions and work organisation to the needs and expectation of the customer. Customer-oriented processes flow with the structure instead of cutting across functional boundaries. Pleasing the customer is valued more highly than pleasing the boss. Teams are formed around the process rather than simply recreating functions within the firm. Key performance indicators therefore measure demonstrated value, customer satisfaction and employee satisfaction and motivation.

A similar contrast between conventional wisdom and the new industrial realism is evident in the way in which the performance of project teams is measured. The performance of project teams is often associated with their ability to meet deadlines, budgets and technical specifications. Morris (1987; 1988), however, identifies functionality, or the capacity of the project to function in the way expected by the client, as a key dimension of success. Good programme and cost performance can mean very little if the end product fails to perform. The Thames Barrier and the Channel Tunnel are examples of how a completed project can be considered successful despite major cost and time overruns. Furthermore, a study of 605

projects by Baker, Murphy and Fisher (1988) supports the view that the overall project should be regarded as a success "if there is a high level of satisfaction concerning the project outcome among key people in the parent organisation, key people in the client organisation, key people on the project team, and key users or clientele of the project effort" (1988: 903).

Since the overall performance of a project- or team-based organisation can be viewed as the aggregation of all the separate performances of its project teams, it is logical to discuss measures of group and organisational effectiveness in similar terms. Hackman (1990) argues that group effectiveness depends on a team's standing in three areas: "the degree to which the group's productive output (that is, its product, service, or decision) meets the standards of quantity, quality, and timeliness of the people who receive, review, and/or use that output"; "the degree to which the process of carrying out the work enhances the capability of members to work together interdependently in the future"; and "the degree to which the group experience contributes to the growth and personal well-being of team members" (Hackman, 1990: 6-7). McGrath (1990) adopts three similar measures, referring to the group's production, member support and well-being functions. These dimensions of group effectiveness do not attempt to discriminate between the content of different organisational or project tasks, and nor do they simply rely on counting team outputs. Measures of team performance are context-specific and focus on customer satisfaction and employee satisfaction indices, as well as profitability and productivity. Eisenstat's (1990) study of the Fairfield Systems Group, for example, reported that the team performed well above average on measures which included the acceptability of the teams' products and member motivation and satisfaction. In contrast, the performance of Kahn's (1990) university athletic teams was a function of their win-lose ratios, while Friedman's (1990) Children's Theatre Company isolated the reaction of audiences to the performances they attended and the satisfaction of cast members with their experiences in the shows, and Saavedra's (1990) beer sales

and delivery teams their effectiveness in terms of sales, team health and individual satisfaction.

Linking work organisation design and production capability to the perceptions and experiences of customers, as well as to conventional measures of performance such as income and productivity, is critical to the development of a model of high performance team work design which is internally consistent and rigorous. It would be incongruous to argue that customer satisfaction is the most apposite indicator of performance in the new competitive environment and then rely on traditional measures of performance (such as market share and profit) to establish which design factors or team processes should be retained in the model. It would be equally incongruous to hypothesise that the team model of work organisation design should be at the heart of the organisational infrastructure and then measure individual perceptions and performances. Of course, for the independent researcher, customer satisfaction data is difficult to obtain. Not all organisations collect customer feedback and, when they do, it is rare that they will give privileged access to third parties. Setting aside self-report measures of performance which can be unreliable, one alternative might be to elicit the assessments of senior managers in the organisation who have knowledge of comparative team performances. The formation of a panel of judges might reduce the possibility of bias, but because the panel exists *outside the value creation and realisation process*, it is unlikely to be sufficiently sensitive to variation in the key design and process variables.

Because of the author's access to performance data within Conorg, it will be possible to measure the satisfaction of the population of construction project team's customers. This is an advance on previous empirical research which focused on (a) measures of value *creation* in the labour process (e.g. productivity), (b) self-report performance evaluation, and (c) measures taken from outside the value creation chain (panel of judges). In addition, two other performance measures will be taken. The

first, productivity, is a conventional measure derived from the number of team hours per £'000 of the project's value. The second, income, is also a conventional measure, but focuses on the realisation of value in the market as profit. These three measures will be supplemented by two measures of employee satisfaction: satisfaction with the work itself and satisfaction with the team's social and task environment (social desirability). Collectively, these measures of stake-holder satisfaction and value creation and realisation will provide a more contemporary and relevant assessment of organisational performance.

3.3.2. Team Processes

The influence of group membership on the behaviour of its members is a well-established phenomenon in psychology (Kretch, Crutchfield and Ballachey, 1962), as well as in disciplines such as social history (Burke, 1980) and Industrial Relations (Poole, 1981). The way in which members behave in groups is affected by norms which determine acceptable and unacceptable standards and patterns of behaviour. The ability of a work group to affect the performance of its members first gained prominence in the Hawthorne plant experiments (Roethlisberger and Dickson, 1939). The Relay Assembly Test Room phase of the Hawthorne studies demonstrated that employees continually worked to their own production standard rather than following the engineering standard set by the company. The classic definition of group process is provided by Steiner (1972): "Process is a series of behaviours, one following the other, each determined by those that have gone before and each, in turn, influencing those that will come later" (1972: 8-9). Steiner asserted that actual group productivity equals its potential productivity minus losses due to faulty group processes. The central role of process loss, or the impediments to optimal group performance, stimulated considerable subsequent research. Gist et al (1987) locate this research in three primary categories: social facilitation, social loafing and social impact. A meta-analysis of 241 social facilitation studies concluded that the presence

of others leads to a small impairment in the performance of complex tasks when measured by speed and accuracy (Bond and Titus, 1983). Social impact and social loafing are phenomena theorised by Lattané in a series of papers (1979; 1981; 1986) and discussed below.

From an initial interest in the 1964 New York murder of Kitty Genovese which was witnessed by 38 people, none of whom intervened while she was being stalked and killed, Lattané developed a theory of responsibility diffusion (Lattané, 1981). This theory suggests that individuals are less likely to behave responsibly if the responsibility is shared. "If each of the thirty-eight, isolated in his or her own apartment, was aware that others also were witnesses to the event, each may have felt a lessened sense of personal responsibility to shoulder the onus of action" (Lattané, 1986: 280). Social impact theory (Lattané, 1981) extends this idea, arguing that an individual may feel more inclined to act when the responsibility for action is not shared with others. This feeling of responsibility decreases marginally when more people are added to the social setting. In a work environment "we should therefore expect a decrease in individual effort in such circumstances as a function of the number of other persons who are also responsible for the work to be done" (Lattané, 1986: 281).

One outcome of this tendency towards responsibility diffusion in social settings is what Lattané terms 'social loafing'. Social loafing refers to the way that individual effort decreases as the size of a group increases. Lattané et al (1979) found support for this phenomenon in a programme of laboratory-controlled experiments. The experiments progressed from initially seeing if volunteers put more effort into producing noise (clapping and shouting) alone or in dyads to a more sophisticated study of cognitive effort where participants were asked to work on anagrams alone and in groups (Lattané, 1986). The results showed that social loafing occurs on both physical and cognitive, or intellectual, tasks. In the cognitive, anagram study, "they

found an average of 14.5 different words when working as individuals but only 13.4 words, 92 percent of their alone rate, when working as part of a group ($p < .001$)" (Lattané, 1986: 297).

Lattané concludes that the pervasive nature of social loafing - found in collectivist cultures such as India as well as in the United States - does not obviate the important role of groups in organisations and society. In many cases, groups can achieve far more than individuals working alone. Although (occasional) social loafing clearly results in short-term productivity losses, it can contribute to increased job satisfaction and quality of working life which may have longer-term benefits to the organisation. However, in general, social loafing is viewed as a negative group process which can spiral into free-riding by some group members and the exploitation of others who acquire the lion's share of the task. But productivity is not the only area where some groups can prove less effective than the sum of their individual members (Yetton and Bottger, 1982). Janis (1982) is well-known for his case studies of sub-optimal policy decisions in US presidential decision-making groups (e.g. Pearl Harbour, Bay of Pigs, Korea, Vietnam) which he attributes to 'group think'. Group think is defined as "a mode of thinking that people engage in when they are deeply involved in a cohesive in-group, when the members' strivings for unanimity override their motivation to realistically appraise alternative courses of action" (Janis, 1982: 9). High group cohesiveness - based on strong interpersonal attraction - was seen as a precondition of groupthink. Highly cohesive teams develop norms which perpetuate group security, unanimity and satisfying interpersonal relationships. Janis (1982) noted how these symptoms resulted in a reluctance to consider more than a minimum number of alternative courses of action and a tendency towards high risk decision-making.

More recent research, however, challenges Janis's notion of group-think (e.g. Longley and Pruitt, 1980; Leana, 1985). Leana (1985), for example, found no evidence that

group cohesiveness resulted in the generation of fewer alternatives and that it did, in fact, positively influence the volume of information collected. Moreover, Leana (1985) building on Longley and Pruitt (1980), also concluded that members of long-tenured and cohesive teams may feel better able to challenge one another and thereby bring out more discrepant information than typically occurs in new groups. Hogg (1992) argues that there is a need to reconceptualise cohesiveness within the framework of social identity theory and self-categorisation theory (Hogg, 1992: 140). Hogg argues that self-categorisation theory "in terms of a salient self-inclusive social category depersonalises perception and behaviour in terms of the contextually relevant in-group prototype (norm, stereotype)" (1992: 141). This perspective does not reduce group phenomena to a set of interpersonal processes but encompasses the full range of inter- and intra-group behaviours (e.g. norms, prejudice, conflict, conformity). Thus *in groupers* perceive themselves and other in groupers in relation to a dominant group norm which has a more substantial influence on cohesiveness than interpersonal attraction alone. "From this perspective, groupthink represents an unremarkable group phenomenon in which defective decision-making processes are adopted because group members identify (i.e. self-categorise) very strongly with a group that either has no procedures for effective decision-making, or has norms that explicitly encourage groupthink" (Hogg, 1992: 141).

Hogg (1992) extends this theory to critically appraise the contradictory evidence revealed by research into the relationship between cohesiveness and group task productivity/performance. For example, he cites research into sports team performance which reveals positive, negative and non-significant correlations between various measures of cohesiveness and performance (e.g. Martens and Peterson, 1971; Landers and Luschen, 1974; Carron, 1980). Self-categorisation theory suggests that this is probably a consequence of the researcher's failure to isolate the referent group norm or goal that relates to productivity or performance levels. Because in mainstream research cohesiveness is associated with interpersonal

attraction - and is therefore measured as such - we would only expect to find a positive correlation between cohesiveness and performance in groups defined by a successful performance norm. Hogg concludes that this has implications for work organisation design because it emphasises the importance of encouraging teams to construct and internalise a group norm which is relevant to the group task (Hogg, 1992: 146). For groups to be effective they must adopt performance strategies that are consistent with the performance requirements of the task.

Recently, research into group process has taken a new, potentially more useful direction by identifying the dimensions of a group's *climate* which are predictive of desired outcomes. This extends and consolidates the literature on, for example, cohesiveness and participation and provides a mechanism for isolating the relative importance of different norms and behaviours in predicting innovation, productivity, customer satisfaction and other work group outcomes. Whereas organisational *culture* is “a social process associated with a unit in which members share a common set of elements - assumptions and world views, values, behavioural norms, patterns of activities, and material artefacts” (Rousseau, 1990: 160), “the dimensions of climate are generic and can be applied to any and all organizations” (Gaston and Sparrow, 1994: 5). Anderson and West (1992) trace climate's antecedents through two principal theoretical strains: the *cognitive schema* approach, which is conceptualised at the level of the individual and is concerned with the different ways that individuals make sense of their working environments (e.g. James and Sells, 1981), and the *shared perceptions* approach which attempts to discover the extent to which group members interpret their proximal environments in similar ways. The second approach informs the recent burgeoning of interest in organisational and team climates but this has not been unproblematic for two reasons. Firstly, there have been problems specifying what constitutes a minimum level of agreement on facets of climate among group members (e.g. Guion, 1973). And, secondly, the principal dimensions of climate have proved difficult to identify and define. Some progress

has, however, been achieved in both areas. James et al (1984), for example, propose that an inter-rater reliability with a criterion value of at least 0.70 is acceptable and this seems to be accepted as the norm in climate research (e.g. Gaston and Sparrow, 1994). A gradual shift towards the measurement of facet-specific climates (Rousseau, 1988) has also emerged as a remedy to the problem of climate definition. Thus climate is defined in terms of a referent outcome such as climate *for* innovation or climate *for* change (Anderson and West, 1992).

The concept of climate can improve our understanding of team processes as a mediating factor between the creation of the enabling conditions necessary for effective performance and the performance itself. Although it could be argued that the type of measures used by Gladstein (1984), for example, in her test of group process might constitute facets of climate, there is a paucity of studies which examine the *multiple* dimensions of climate on team performance (Anderson and West, 1992). From an original model by West (1990), Anderson and West (1992; 1994) have developed a multidimensional measure of facet-specific climate for innovation within work groups which is the subject of on-going psychometric validation (e.g. Agrell and Gustafson, 1994). The measure is based on a four-factor theory which is grounded in an extensive review of the social-psychological literature. The four factors are vision/shared objectives, participative safety, task orientation and support for innovation. Each factor will be briefly described below.

Vision, or shared objectives, refers to the presence within the team of a common goal which binds team members to a realistic and credible purpose. Anderson and West (1992) suggest that team vision has several characteristics or sub-dimensions. The vision must be *shared* or negotiated by the team to ensure that all team members subscribe to it; it must have *clarity*, since this will focus the team's task and innovation processes; and it must be flexible enough to *evolve* through changing circumstances. Participative safety is closely related to the concept of cohesiveness.

The idea of safety differentiates Anderson and West's model from previous conceptualisations of participation or involvement because it emphasises the importance of an interpersonally non-threatening environment within which participative decision-making should take place (1992). Evidence for this proposition is drawn from studies of child development (e.g. Ainsworth, Biehar, Waters and Wall, 1978) and the therapeutic context (e.g. Rogers, 1961). Task orientation is the third factor in the model and is described as "a real commitment to achieving first-rate performance through modifying procedures and implementing improved methods of work or work practices" (Anderson, Hardy and West, 1992). Task orientation is underpinned by Tjosvold's (1991) dynamic of constructive controversy which involves the elaboration of opposing views, the search for mutual understanding, and the integration of different perspectives into a creative solution (1991: 172). It is, in Hogg's (1992) terms, the referent group norm which acts as a foil to the pernicious effects of group-think. Support for innovation is the *espoused* and *practical* encouragement of attempts to introduce new ways of working into the team. Support takes several forms, including verbal support, interpersonal co-operation and the provision of time and resources (Anderson and West, 1992: 9). The key source of support for innovation is the team leader.

Anderson and West's four-factor theory proposes that vision, participative safety, task orientation and support for innovation are the principal facets of a positive team climate and that these apply across different organisational (and cultural) settings. The theory considerably extends existing conceptualisations of group processes by identifying specific constructs that, when present in sufficient quantities within the team, lead to higher levels of operating effectiveness. The four factors, together with a social desirability scale (Anderson and West, 1994: 27), will therefore be included in the model of high performance team design as predictors of team performance. These relationships are shown in figure 3.4. overleaf.

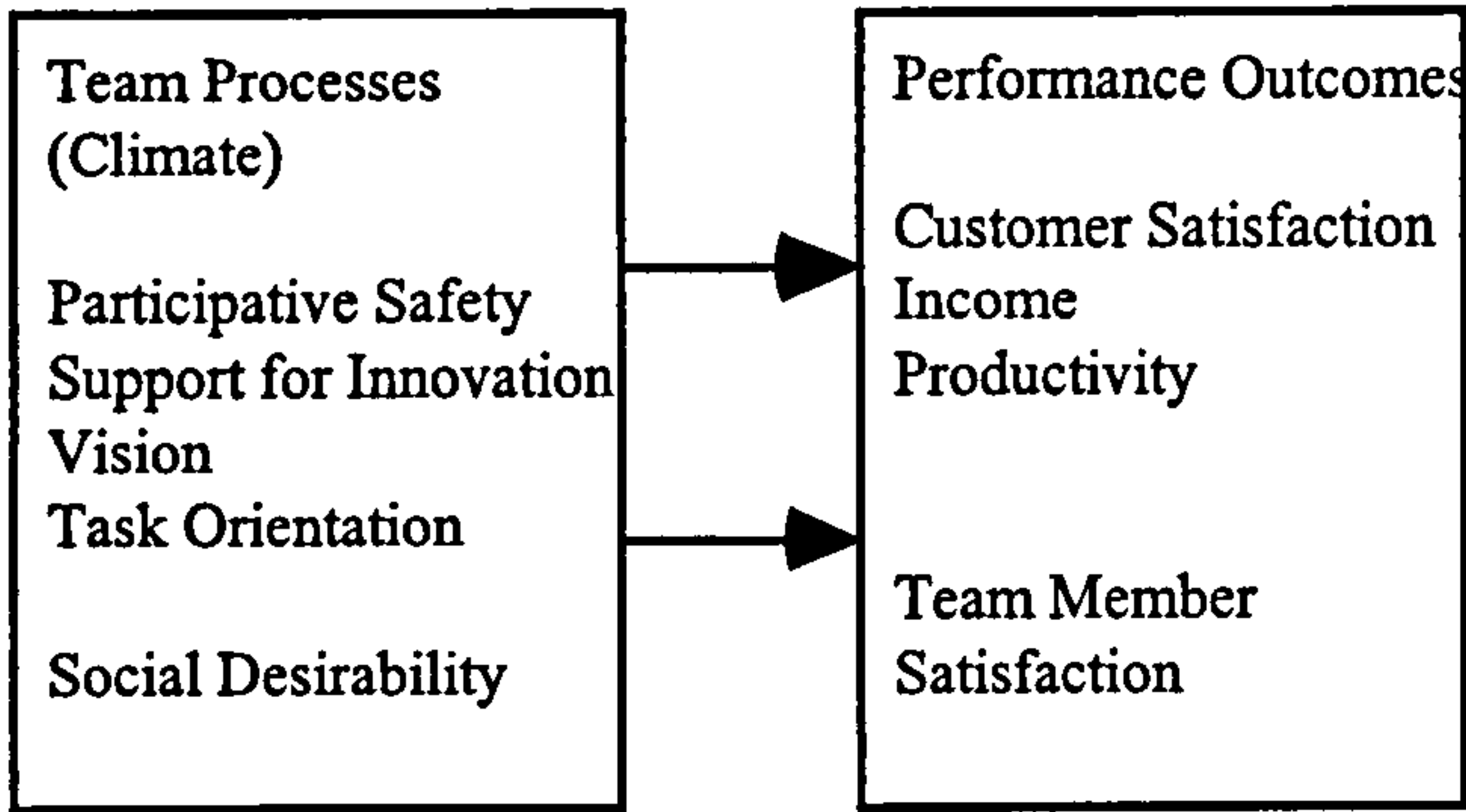


Figure 3.4: Team Climate as a Predictor of Team Performance

3.3.3. Team Performance Enabling/Design Factors

The way that individual behaviours are influenced by group membership and transformed into streams of activity, or processes, determines the overall effectiveness of the team. If team members do not work well, either separately or together, they will fail to meet and/or exceed customer service and value expectations. Ineffective processes can be the result of lack of trust between team members, unwillingness to challenge the status quo, absence of clear and shared objectives, and a lack of commitment to achieving the highest level of performance possible (Anderson and West, 1994: 18-20). Team climate has been hypothesised to predict team performance. But because team climate is a construct derived from members' shared perceptions of the social and task environment, it is hypothesised that climate can be influenced by changes in and to that environment.

Given this theorisation of the relationship between team climate and team performance, it can be suggested that changes in the social and task environment will affect the team's climate and that this, in turn, will affect the team's performance. If team climate is predictive of team performance, then the creation of conditions in which team climate can be strengthened is an important concern for team designers. This section will identify the design factors, or enabling conditions, which are

hypothesised to predict a healthy team climate. Wherever possible it will relate these factors to the experience of construction project management teams.

3.3.3.1 Team Leadership

Leadership theories abound. From trait, or charisma, theories of leadership (e.g. Stogdill, 1948), through leader behaviour theories (e.g. Lewin, Lippitt and White, 1939; Blake and Mouton, 1964) and contingency or situational approaches (Fiedler and Garcia, 1987; Hersey and Blanchard, 1988), to more recent conceptualisations such as the vertical dyad linkage or leader-member exchange model (Graen and Schiemann, 1978; Graen, Novak and Sommerkamp, 1982), the transactional (Hollander, 1978) and transformational (Bass, 1985; Tichy and Devanna, 1986) approaches, and substitutes for leadership such as self-management (Kerr, 1976; Manz and Sims, 1987). All of these theories share a common aim which is to determine what makes an effective leader.

The leadership of project teams, however, requires a different theoretical framework. Much of the existing theory is premised on the leadership of whole organisations whereas our interest here is in the creation of the ambient conditions which promote effective teamwork. The team leader will be specifically responsible for the performance of the group and for linking the group to the wider organisational system. This definition leads to the conclusion that the role of the team leader is above all "to ensure that all functions critical to both task accomplishment and group maintenance are adequately taken care of" (Hackman and Walton, 1986: 75). This view can be contrasted with the role of the project manager in project management texts. Project management is defined almost exclusively in relation to the tools and techniques associated with the project implementation life-cycle. Thus Harrison (1985) describes the role of the project manager in terms of planning, control and managing people, with the emphasis on the first two elements. A review of the two

volumes of papers presented at the 11th INTERNET world congress on project management reveals that only a small number focused on behavioural as opposed to technical subjects. Descriptions of feasibility curves, project cash flows, risk assessment procedures and strategic planning techniques are easily ascendant over papers on 'human factors'. Similarly, of the Association of Project Manager's (APM) eleven specific interest groups, only two address issues outside the technical content and project control agendas (women in project management and project organisation and team working).

Buchanan and Boddy (1992) conclude that the project manager is expected to be skilled in the technical content of the project to be executed and in "defining outcomes and the necessary activities along the way, monitoring activity and progress, and taking remedial action to minimise deviations from the planned project life cycle" (1992: 8). This emphasis on the content and control agendas is apparent on construction projects where many project managers immerse themselves in the technical detail of the task and in monitoring and reporting progress against time, cost and quality plans. Few profiles of the effective project manager include competences like team building, conflict management and development of team members alongside planning, organisation and control competences (although see Pettersen, 1991). The result is that many project managers who find themselves in what Buchanan (1991) calls a high vulnerability context are relying on the exercise of skills, knowledge and experience which may be inappropriate. In conditions of high task complexity and uncertainty, process skills such as sensitivity, flexibility, team building, networking, tolerance of ambiguity, interpersonal skills, enthusiasm, political awareness and influencing may be more critical predictors of successful project management performance (Buchanan, 1991; Boddy and Buchanan, 1992).

One consequence of this high control environment is that power and decision-making authority is concentrated in the hands of the project manager. All decisions which

have any bearing on the passage of the project are taken by the project manager. The concept of power is useful because it helps to explain the nature of the interpersonal relations between leader and team member. Power, according to Kanter (1983) "is intimately connected with the ability to produce; it is the capacity to mobilise people and resources to get things done" (1983: 213). French and Raven (1958) identify five types or bases of power - reward, coercive, referent, legitimate and expert - which share the common characteristic that leader power is a function of the follower's belief in the efficacy of that power. In addition, the exercise of one power type (for example, coercive) can inhibit the use of another power type (for example, referent), and different types of power can be appropriate in different situations. Griffin (1979), for example, suggests that if a task is not intrinsically motivating, there is greater need for a task-oriented structure to be provided by the leader. However, where the task is motivating and team members have sufficient knowledge and expertise to perform the task without strict supervision, the leader role can change to one of support and maintenance rather than direction and control.

The emergence of self-directed work teams presents a paradox for the leader role in these new organisations (Lawler, 1986; Manz and Sims, 1986). Despite the growth of this phenomenon, particularly in greenfield manufacturing plants, the position of team leader is being retained (Zenger et al, 1991; Jessup, 1990; Guest, 1989). Typical of the change from *internal* leadership to the *external* leadership of teams is the following quote by a 'supervisor' in a North Carolina plant: "I really feel good because now I can work on the long-range planning and problem solving, areas in which I can make the best contribution. Now I'm not bothered every five minutes by someone wanting me to sign something. I just refuse to make the decisions when they know the right answers already" (quoted in Jessup, 1990: 83). The assumption of power and responsibility by team members means that the team leader can focus on the management of external relationships and ensuring that the team has the necessary resources and expertise to achieve its task. Guest (1989), however, records

that at the Jamestown, New York, engine plant of the Cummins Engine Company the earliest experience of self-management had led to the excesses of a *laissez-faire* management style and the virtual abdication of all responsibility by team leaders. A stronger team leadership style was called for: "we expect team members to manage their work and team managers to manage the work of their team" (quoted in Guest, 1989: 33).

Leadership style has therefore become a critical issue for managers and organisations. Given the development of project management and particularly the way that it is taught, it is suggested that the prevailing context - particularly the role of the client - may be antithetical to innovations such as team self-management. Moreover, many construction firms are representative of what Walton and Hackman (1986) call control strategy organisations (see also Walton, 1985). A control strategy organisation is characterised by top-down control and co-ordination and emphasis on positional authority and status, which is designed to denote and reinforce the relations of subordination and compliance. If it is true - and this is certainly not proven - that there is a general trend in western economies towards commitment-based organisations, then organisations who attempt to make this transition face acute difficulties in effecting the necessary changes in their cultures. The identification of critical leader behaviours and their development in, for example, project managers is a key constituent in the change process. Fiat, for example, has held training programmes in transformational leadership for 200 of its top executives (*alta direcciones*) and many of its 4,000 middle managers (*direcciones*) and 20,000 supervisors (Bass and Avolio, 1994: 2).

Hackman and Walton (1985; 1986) propose a functional approach to the leadership of teams which is linked to Hackman's normative model of group effectiveness. Thus "the critical leadership functions for a task performing team in an organisation are those activities that contribute to the establishment and maintenance of favourable

performance conditions" (Hackman and Walton, 1986: 89). The role of the team leader is therefore to assess the team's direction, structure, context, coaching and assistance and rewards, and take any action to improve areas of weakness. For example, the team leader may need to negotiate with the parent organisation to provide rewards for outstanding team performance, or to clarify the team's objectives and direction, or to bring new skills into the team, or to inject some needed constructive controversy into the group to encourage questioning of task performance strategies, and so on. This model of leadership assumes that team leaders must be able to work backwards from an evaluation of how the team is performing, identify the necessary pre-conditions of effective performance and then apply leverage to improve those conditions. The team leader requires sufficient quality and quantity of information about the team's performance and should possess both the competence and the power skills to effect change in the performance conditions. Although as the team matures it will perform many of its own internal leadership functions, the leader must continue to monitor the team to ensure that these functions are fulfilled.

Although Walton and Hackman's work serves as an exploratory preamble to the identification of the behaviours which are likely to be more or less successful in instigating and maintaining group effectiveness, it remains a normative model. Manz and Sims (1987) attempt to define the behaviours connected with the effective leadership of self-managing teams using both quantitative and qualitative techniques in a medium sized manufacturing plant. The researchers observed team leaders, or co-ordinators, encouraging team members to engage in self management behaviours, such as self evaluation of the quality and value of their outputs. They witnessed "an abundance of deliberate and calculated efforts to foster independence rather than allow the dependence of more traditional work groups" (Manz and Sims, 1987: 114). The subsequent development of a self management leadership questionnaire was refined under factor analysis into a fifteen factor solution. Although the sample size was too small to allow meaningful conclusions to be drawn, there was sufficient

evidence to support the existence of a relationship between self management leadership behaviours - particularly 'encourage self-reinforcement' and 'encourage self-observation/evaluation' - and ratings of overall leader effectiveness. Moreover, information supplied by senior managers indicated productivity gains in excess of 20 per cent above other plants using the same technology but more traditional supervisory methods. Their study therefore confirmed that, in certain situations, self managing teams are more efficient than conventional work organisation designs, and that self-management leader behaviours generally represent important indicators of leader effectiveness in team situations (Manz and Sims, 1987: 124).

Project management has been described as the management of change. Having emerged as a definable function during the 1950s as a response to the demands of the US defence and space programmes, it now occupies a central role in the development and delivery of products and services in many customer-oriented industries. The role of project management in construction is to co-ordinate functionally interdependent disciplines to complete projects within established goals. Project conceptualisation, planning, execution and termination is a process of continuous incremental change in which a new product gradually evolves. In large complex projects where it is impossible for a single individual to possess knowledge of the entire technical content of the product, it is important that the leader manages the process by which the team develops and executes the solution itself. The nature of project management lends itself to the application of self-management approaches to team design. Project managers must therefore demonstrate competencies which create an environment that enables the team to achieve the project goals.

Kouzes and Posner (1987) present a model of leadership which captures the essence of the external leadership of empowered teams and is simultaneously relevant to the unique challenges of project management. They argue from the premise that leadership "is a process ordinary managers use when they are bringing forth the best

from themselves and others" (1987: xxi). Leadership is portrayed as a learnable set of five behaviours: *challenging* the process, *inspiring* a shared vision, *enabling* others to act, *modelling* the way and *encouraging* the heart. Leaders foster innovation and change in work processes by setting realistic *challenges* which stretch team members and liberate them from boring work routines. Challenge is intrinsically motivating and creates job satisfaction, but it requires oversight on the part of the team leader (Kouzes and Posner, 1987: 59) and willingness to tolerate occasional failure. This is psychologically threatening for some people and leaders must help their team members cope with the uncertainty of change. Leaders must also provide their team members with a clear sense of direction which is realistic, credible and attractive. Kouzes and Posner state that "when leaders clearly articulated their *vision* for the organisation, people reported significantly higher levels of job satisfaction, commitment, loyalty, *esprit de corps*, clarity of direction, pride and productivity" (1987: 93). They invoke the jig-saw puzzle principle by which it is easier to put the puzzle together if you can see the picture on the cover of the box. But the real importance of defining a clear vision is to unite the team behind it and this is problematical. The key to inspiring a shared vision is to seek consensus by appealing to a common purpose, to communicate expressively about the vision (e.g. Martin Luther King's 'I have a dream' speech) and to be seen to believe in the vision through consistent actions. Kouzes and Posner emphasise that this is not dependent upon individual charisma or personality traits.

The third behaviour is enabling others to act and this is achieved by fostering teamwork and sharing power. Leaders break down barriers between specialists by encouraging physical and psychological interdependency, reciprocity and co-operation. The cement which binds team members together is trust and leaders must set the example through openness and predictability and by involving team members in planning and problem solving. This means giving power and information to the team and permitting the exercise of independent judgement and autonomous

decision-making. *Modelling* the way has two dimensions. Firstly, it requires that the team leader behaves in ways that are consistent with his/her espoused values and, secondly, it involves envisaging the change process as a series of small wins (Kouzes and Posner, 1987: 219). Small wins form the basis for a consistent pattern of achievement throughout the change process. The final behaviour, *encouraging* the heart, relates to the team leader rewarding and recognising individual team members contributions to the achievement of the common vision. This extends traditional notions of financial rewards by focusing on intrinsic rewards such as praise and coaching, as well as public declarations of the team's achievements.

Leadership in construction project management has been identified as an important element in the improvement of construction performance (Bresnen, Bryman, Ford, Keil, Beardsworth, Jepson and Wray, 1984). There are two general themes that emerge from the *leadership in construction* literature. Firstly, that a 'supportive' style of leadership is associated with more effective construction management. And secondly, that the inclusion of situational variables is central to the study of leadership in an environment characterised by wide variations in size of project, type of work, level of technological complexity and degrees of specialisation (Bresnen, Bryman, Ford, Beardsworth and Keil, 1986: 372). The variability in project context is hypothesised to require project managers to diagnose the team's environmental context and decide which behaviours best match the situation. There are few empirical studies of the effects of leadership on performance in construction, but those that do exist adopt the contingency methodology. Bresnen et al (1987), for example, use Fiedler's (1967) contingency model and the Least Preferred Worker (LPC) scale to examine the relationship between leader orientation and project performance measured in terms of progress on site. In a study of 40 projects, they found that "better performing contracts are more likely to have site managers with a stronger relationship-orientation" (Bresnen et al, 1987: 379), particularly on larger projects.

Contingency approaches to the study of leadership in project management are helpful because they recognise the uncertainty and complexity of the project environment. Bresnen et al's (1987) study also found that a relationship-orientation is associated with higher performance on large, high value, longer-term projects. But these models are limited for three reasons. Firstly, the dichotomy between task-orientation and relationship-orientation does not increase our understanding of the *specific* leader behaviours that lead to high levels of performance. Secondly, contingency models do not examine the effect of leader behaviours on the team processes which are responsible for value creation and, ultimately, customer satisfaction. And finally, contingency models are insufficiently sensitive to the propensity of the project manager to take control of her environment through transformational leadership practices.

Kouzes and Posner's (1987) model of leadership is relevant to construction project management because it is underpinned by an assumption that leadership is concerned with the management of change through the empowerment of others. Because each construction project is different, the core task of the project manager is to create an environment in which team members are able to manage uncertainty and change. It is therefore hypothesised that (1) encouraging, enabling, challenging, envisioning and modelling leader behaviours will contribute to the formation of a healthy team climate and (2) these behaviours are relevant at all stages throughout the construction project life-cycle and are not necessarily contingent upon changes in the project context.

3.3.3.2. Team Organisation

Team Organisation is a collective term for several variables which are related to the way the team and its task is set up at the outset of the project (Hackman, 1990). The

variables are: group norms, task structure, group composition and tenure. It is suggested that each of these factors is influential, and can be influenced, at the point that the project team is formed/designed.

3.3.3.2.1. Group Norms

Group norms were defined by Sherif (1936) as the "customs, traditions, standards, rules, values, fashions, and all other criteria of conduct which are standardised as a consequence of the contact of individuals" (1936: 3). Sherif's use of the auto kinetic phenomenon showed that, in novel environments, individual perceptions will gradually align with those of other group members. The group norm "guides behaviour and facilitate[s] interaction by specifying the kinds of reaction expected or acceptable in a particular situation" (Jones and Gerrard, 1967). Norms are pervasive and affect the way team members perceive and accomplish the task, promoting task goal attainment and the ability of team members to work together in relative harmony (Johnson and Johnson, 1991). They have a particularly strong effect on communication patterns within and between groups, facilitating or inhibiting the coordination of independent action into a mutually productive whole (Church, 1994). McGrath (1984) treats norms as expectations about what *ought to* happen and argues that active group members will attempt to establish and legitimise certain behaviours that may eventually become behavioural norms. Other group members may be willing to give up power and allow themselves to be influenced by these norms (Johnson and Johnson, 1991).

Much of the research interest in norms centres on the development of group norms within a temporal life-cycle (Bales, 1951; Tuckman, 1965; McGrath, 1984; Bettenhausen and Murnighan, 1985; Gersick, 1988). Tuckman's (1965) conceptualisation is the most popular, positing group development through a systematic sequence of four identifiable structural-functional states: forming,

storming, norming and performing (and latterly adjourning). Hare (1976) and McGrath (1984) follow a similar approach. McGrath's (1984) four stages are, firstly, generating plans, ideas and discussing goals and values; secondly, choosing alternatives and agreeing a performance strategy (which may involve conflict); thirdly, resolving the conflict, developing shared norms, and allocating roles amongst team members; and fourthly, performing and becoming cohesive. Bettenhausen and Murnighan (1985) are critical of models which compress group development into a linear sequence of inevitable stages (1985: 350). They argue instead that "uncertainty over appropriate behaviour leads members to use their past experiences in similar social settings as *scripts* for choosing behaviours in the current situation" (ibid). Their controlled observation of 19 five-person groups led them to conclude that unique performance norms typically formed during their very first agreement (Bettenhausen and Murnighan, 1985: 359).

Bettenhausen and Murnighan (1985) surmise that where group members share similar past scripts (possible because they may be members of the same parent organisation), group formation will proceed without incident. However, where the scripts are different individuals will need to spend considerable time getting to know one another and developing a shared understanding of the group's objectives and appropriate task performance behaviours. In both cases there is a need for intervention. Although group members may view their new environment through a similar lens, this may not fit with the requirements of the task (e.g. where members move from a straightforward to a more complex project). If the script is inappropriate it will need to be challenged. Similarly, if team members have no common basis for developing a shared meaning, it will also be necessary to intervene at the point *where the team meets for the first time*. Gersick (1988; 1990), in a study of the life cycle of temporary task groups, also found the first meeting to be of critical importance because it set the pattern of behaviour for the first phase of the group's life. Within one minute of the start of a team of strategic planners first meeting, she

noted how their dialogue "positioned the team for the first half of its life" (Gersick, 1990: 102). Without any initial storming the "members establish basic norms instantly and begin working together in synchrony" (Gersick, 1990: 103). This track dominated the group's behaviour for the first half of its life until, at the midpoint, the group experienced a transition. This transition was characterised by five factors: (1) a break in the group's momentum, (2) an awareness that time was running out, (3) change in group routines (e.g. new meeting times, places, styles etc.), (4) intervention by the team's leader or supervisor, and (5) agreement on new task-performance strategies followed by a burst of progress (Gersick, 1990: 106-7). The transition to the second phase heralded the commencement of the group's major production period which lasted until the termination of the task or project. Although there was obviously great diversity in the content of each group's task and task-related behaviours, Gersick reports "surprising regularity in the rhythms of continuity and change in group life cycles" (Gersick, 1990:110).

Petrock (1990) argues that a team does not become productive until sound norms are in place. Cohen's (1990) study of a hospital top management group identified the presence of a strong group norm which inhibited overt discussion of member's needs and priorities and made resource allocation decisions virtually impossible. Unwillingness to allow any conflict to enter group processes impeded the team's achievement of its goal which was to develop a hospital-wide service delivery model and philosophy. In order to address this problem, Cohen suggests that direct intervention from the team leader is needed to force members to acknowledge and deal with disagreements that exist within the team. Hackman (1987) supports this view and develops it in relation to Gersick's time and team transition model. He cites the first meeting as an opportunity when the leader can help the team begin to develop the norms that will influence behaviour during the first phase of its life. As the team moves from phase I into its midpoint transition the leader can facilitate the team's assessment of its performance to date. This assessment might prompt the

leader to reaffirm the group's objectives or provide additional resources. During phase II the leader will be available to administer any process or coaching assistance as well as acting as a conduit between the team and the parent organisation. At the completion of the project, the leader can spend time with the team helping members to reflect upon what they have learned for application and extension to future projects.

Because construction projects are unique and norms learned in fundamentally different contexts can be imported into the new project environment, it is important that norms emerge which are relevant to the task in hand. It is also important that these norms reflect customer priorities and concerns and are therefore communicated backwards and forwards through the value creation and realisation chain. For example, different clients give different weightings to factors such as the environment, health and safety, community involvement and equal opportunities, and it is important that team behaviour reflects these norms. Where these norms clash with dominant cultural values within the project team's parent organisation (e.g. a task-orientation versus a relationship-orientation), it is vital that the team leader intervenes to ensure that team members are aware of 'what must always be done in this project' and 'what must never be done in this project'. This must be carefully monitored and managed throughout the project life-cycle, particularly at key transition points.

3.3.2.2.2. The Team's Task Structure

We have already discussed (chapter one) how the task that the individual performs has historically been the main area of attention for work redesigners. Despite a common commitment to the maximisation of value within the labour process, different approaches to the organisation of the task have predominated dependent upon historical, socio-economic and technological conditions. The followers of

Taylor advocated the fragmentation of work into many small tasks, whereas the 'behaviourists' were influential in encouraging the recombination of tasks through job enlargement and job enrichment programmes. Contemporary approaches to the structuring of tasks take a contingency approach which is dependent upon the nature and complexity of the task (e.g. Baron and Greenberg, 1990).

Goodman (1986) defines a task as "a program or a set of operating rules, heuristics, and criteria for the transformation process. Tasks describe activities in a particular job or activities that must be accomplished between jobs. Multiple tasks can be assigned for a given job. Tasks for a particular job could be core tasks that directly (in space and time) act on the object in question or support tasks that permit the core task to function" (Goodman, 1986: 140). The structuring of tasks in the construction industry has been determined by two factors: firstly, the unique nature of the product development process and in particular the creation and management of the linkages between each of the stages in this process. And secondly, the growth of scientific knowledge about this process which led to the proliferation of many related skills and their subsequent 'professionalisation' (for example, architects, quantity surveyors, engineers, builders). The fragmentation of the construction industry has already been referred to, but it is difficult to separate an examination of construction project tasks from their historical and cultural antecedents. Although the development process takes the product through distinct stages - for example, from design to construction - there is considerable cross-functional interdependence between the different disciplines.

It might be argued that the highly fragmented construction project process, and in particular its strict adherence to principles of scientific management (especially Gantt's planning influence), has created jobs around tasks which are not intrinsically motivating. This conclusion may be partly true at the workplace where there have been efforts to retrieve control over the building process from craftsmen and women

through innovations such as pre-fabrication and modularisation. But there has also been a trend towards the creation of a multi-skilled work force with a broader base of skills (CISG, 1989). At the level of construction project management, the professional institutions have jealously guarded their control over the product development process, encouraging working practices which preserve their members' position in the team without adding significantly to the value-creation system (Porter, 1985; Matthews, 1992). As long ago as 1964, the Banwell report argued that "the relationship between those responsible for design and those who actually build must be improved through common education". More recently, Andrews and Derbyshire (1992) presented a paper "with the aim of establishing the scope for greater commonality and purpose in the education, training and continuing professional development of construction professions".

Hackman and Oldham (1980) emphasise the importance of the motivational structure of the group task to the amount of effort that the individual will exert and suggest that this can be enhanced where five dimensions are present: skill variety, task identity, task significance, autonomy and feedback. It might be argued that, although each specialist in the project development process only has a marginal effect on the overall product, these motivating properties are already present in their jobs. If this is the case, it may be that the issue is not the redesign of individual jobs but rather the re-engineering of the whole development process. This would mirror the conclusions of Womack et al (1990) who compare the *lean* development of new products in Toyota with traditional product development in General Motors. In GM, specialists are loaned to a project team from functional departments. Because career success depends upon progress through functional specialisms, the resultant allegiance to functional departments can lead to conflict between, for example, the interests of different team members (e.g. the individual representing the engine engineering department versus the individual representing the body engineering department). In contrast, specialists in Toyota are wedded to the product development *team*.

Increased continuity allows the use of fewer team members (an average of 333 in Japan compared with over 1400 in Germany during the life of a typical project).

The motivating potential of individual or group tasks is an important predictor of both job or group performance and personal satisfaction. However, it is important to recognise that motivating jobs can reside within a production system that is inherently flawed. We might hypothesise therefore that although the design of construction project management roles can result in high levels of intrinsic satisfaction and work motivation, the configuration of the management process into specialist roles will adversely affect team climate and performance.

3.3.3.2.3. Team Composition and Membership

Research on group composition has focused on several factors including technical competency (Hackman, 1983), interpersonal skills (Katzenbach and Smith, 1993), homogeneity and heterogeneity of member characteristics (Gladstein, 1984; Nieva, Fleishman and Rieck, 1978), team roles (Belbin, 1981, 1993; Margerison and McCann, 1985), gender (Wood, Polek and Aiken, 1985), demography (Robbins, 1991) and size (Nieva, Fleishman and Rieck, 1978; Francis and Young, 1979). Of these studies, the work on team roles has proved most influential. Belbin's Team Role Self-Perception Inventory (BTRSPI) is used extensively in the selection and development of management teams (Hogg, 1990). Belbin has tried to distinguish team member behaviours and to group them into distinct types. These types, or team roles, are consistent over time and, when combined in certain ways, are said to result in high levels of team effectiveness. The nine roles and their functions (in parentheses) are: Chairman (co-ordinator), Shaper (director), Plant (creative thinker), Monitor-Evaluator (critical thinker), Company Worker (achiever), Team Worker (relationship builder), Completer-Finisher (time-keeper), Resource Investigator (outside link) and Specialist (expert) (Belbin, 1981; 1993). No matter how well

designed, though, it is unlikely that any team will contain the perfect mix of team roles. Hurst (1989) therefore suggests that *in situ* teams can be helped by increasing member awareness of the existing role preferences and any gaps. A team development strategy can then be employed to develop secondary or tertiary team roles to achieve a balanced team.

Despite the popularity of Belbin's socio-psychological approach to team formation and development and its dissemination through such diverse organisations as Video Arts and the Test Agency, it is not immune to criticism. In a series of experiments, Furnham et al (1993) provide little psychometric support for the structure of the BTRSPI: "neither the internal reliability nor the factor structure of either inventories (original and revised) give confidence that they could have predictive or construct validity" (Furnham, Steel and Pendleton, 1993: 254). Although recognising the difficulties of converting a non-ipsative (restricted choice) test to an ipsative test, and recognising Belbin's extensive observation of team functioning, Furnham et al question the way that the inventory is used to identify individual team role preferences given the low internal consistencies of the scales and high inter-correlations between them. "For example, the reliability of differences between CO (co-ordinator) ($\alpha = .55$) and TE (team worker) ($\alpha = .34$), given their intercorrelation of 0.41, would be only 0.06 (assuming equal variances)" (Furnham, Steel and Pendleton, 1993: 256). A more practical criticism of behavioural style training is raised by Hackman (1992). In a review of cockpit resource management (CRM) training programmes, he notes that pencil-and-paper tests of behavioural styles "perpetuate the assumption that crew effectiveness will improve if the styles of individual members become better aligned with what is viewed as desirable by the theorists who construct the tests" (Hackman, 1992: 4). Moreover, transferring behavioural techniques learned in the classroom to the workplace is not a straightforward transition and, under pressure, individuals tend to revert to the responses they know best. Hackman therefore proposes the use of practical training

in team skills which will help the team function effectively. For example, training to help deal with interpersonal conflict, to manage a change in team membership, or to manage client or supplier relationships, and so on.

The size of the construction project team is a fundamental work design principle which has a direct bearing on performance. Typically, the literature suggests that teams should have no more than nine or ten members. Katzenbach and Smith (1993) cite ten as maximum, whereas Stott and Walker (1994) and Peters and Waterman (1982) prefer seven, Handy (1991) prefers six, and Johnson and Johnson (1991) between two and six members. The rationale underlying the preference for smaller teams is a pragmatic one: the larger the group, the less likely it is that an individual will be able to participate; the less likely an individual is able to participate, the lower that individual's overall contribution to the group task. In addition, in larger groups there may be more opportunities for 'social loafing' (Lattané, 1986), or domination by a few extrovert individuals. Team leaders may also find it more difficult to create a vision which focuses everyone's activities in a large team. Nieva, Fleishman and Rieck's (1978) research indicates an inverted *U*-shaped relationship between size and performance which is dependent on the level of task diversity and need for coordination between team members. "In support of this inverted *U* function, studies which have reported positive size effects seem to have a maximum of five members in the groups, whereas studies showing negative relationships between size and performance involve much larger groups" (Nieva, Fleishman and Rieck's, 1978: 7) Goodman (1986) notes that there are decreasing marginal productivity gains as members are added to a team past a certain size (which will be determined by the task requirements). During the construction boom of the late eighties the size of projects increased dramatically and this necessitated bigger teams to manage them. Bigger project teams reap higher rewards for construction firms: the more team members on a project, the larger the income, particularly where individual member costs are recoverable from the client. However, it is probably not a coincidence that the

growth in the size of construction projects (and the teams that built them) was accompanied by growing client concern about the low levels of productivity in the UK construction industry relative to, for example, the United States.

3.3.3.2.4. Team Tenure

Time is of special importance to project teams. Project teams develop and exist within a temporal context. Project teams only have a fixed amount of time within which to complete their task. This temporality explains the pervasive role of planning in the organisation of projects which is a device to control time by investing activities into frames (Melbin, 1987). Traditional wisdom suggests that teams reach a performance peak after a few years and then tail-spin into decline (e.g. Smith, 1970; Katz and Allen, 1982). Katz and Allen (1982) for example, identified a clear curvilinear relationship between the mean tenure of team members and the performance of fifty projects in a US. chemical company. Their research attributed the cause of performance decline to gradually rising insulation, stability, specialisation and homogeneity within teams. This argument supports Janis' (1972) view of team cohesiveness as a cause of the pernicious effects of group-think; cohesiveness, of course, develops as a result of sustained member interaction over time. Within *Conorg*, there is a reluctance to keep winning teams together which may have pragmatic roots. Different projects require different resources and is not always possible to keep core teams together. Moreover, given the high levels of task specialisation in the construction industry discussed above, there is a tendency to introduce and release team members at different stages in the project. And, as projects enter their final phases, there is also a temptation to find key team members new homes so ensuring their job security.

If it is true that team performance automatically declines after reaching its peak 2-3 years into its life-cycle, then resourcing strategies which break teams up may be well-

intentioned. However, more recent research by Allen et al (1988) suggests that the curvilinear relationship between tenure and team performance may be true for some teams but not true for all. Their major survey of 2000 individuals on 181 projects in nine organisations revealed that high performing, long-tenured teams are characterised by "strong, influential management to link and integrate the team with the organisation's goals, resources, expectations, etc." (Allen et al, 1988: 307). Hackman's (1992) study of cockpit crews came to a similar conclusion: crew instability brought about by constant changes in crew membership "constrain a crew's ability to 'settle in' and develop performance strategies and routines that are uniquely suited to the particular demands and opportunities of a given day's work" (Hackman, 1992: 8).

Although the transient nature of work within the construction industry makes it difficult to keep teams together at the end of a project, it is hypothesised that long tenure can lead to improved performance among construction project teams (assuming the presence of factors such as constructive controversy and challenging leadership). This dilemma between the resourcing needs of the project-based organisation and the performance needs of individual teams is not easily reconciled. If core teams cannot be kept together, the need for effective team design becomes increasingly important.

3.3.3.3. Team Orientation

Team orientation refers to the factors that exist outside the construction project team's physical boundary which contribute to the attainment of high performance within the team's boundary. These factors operate primarily at the level of the project team's parent organisation and include (a) the extent to which the reward system augments personal rewards with appropriate group rewards for collective achievement, (b) the availability of training to help the team address any gaps in its task-related

knowledge, together with training which helps the team become more cohesive, (c) the appropriateness of the organisational career system and whether or not it creates barriers between team members based on status or hierarchical position, and (d) the quality and quantity of feedback that the team receives on its performance from outside agents, either customers or suppliers or other personnel within the parent organisation.

3.3.3.3.1. Team Rewards

The significance of any reward system is how well it complements and reinforces the organisational and management system (Mahoney, 1992). In traditional control-oriented organisations, the main determinant of pay is the job held by the individual. With the organisation of mass-production into long automated processes of sequential tasks, output could be specified and workers paid in accordance with the rate for the job. With the gradual transition to knowledge- and commitment-based organisations, paying people according to the job they do is being replaced by systems based on pay for competency and contribution. Where individuals are given pay increases or lump-sum payments to learn new skills, this enhances organisational flexibility and responsiveness. This approach applies equally to managers in professional organisations as it does to shop floor production teams, although decisions about which skills to develop are more complex (Lawler, 1992). But while it is always important to recognise high-value individual contributors (Harberger, 1992), effective rewards in team-based organisations present different challenges.

Shea and Guzzo's (1987) concept of task and outcome interdependence is a good starting point for assessing how rewards should be allocated within project teams. Task interdependence refers to the amount of task-driven interaction among team members. The construction of a building requires considerable inter-dependency among team members. In such circumstances of high task inter-dependency Shea

and Guzzo (1987) argue that performance will be enhanced where rewards and other consequences are shared proportionately within the team. Shea and Guzzo use the results of research into distributive justice (e.g. Deutsch, 1975) and the effects of competitive versus co-operative distribution of outcomes to demonstrate that "the consequences of the distribution of rewards to group members depend on the degree of task interdependence in a group" (Shea and Guzzo, 1987: 334). Team members prefer non-competitively distributed rewards when task interdependence is high. Moreover, high task and outcome interdependence acts as a deterrent to *blocking* behaviours such as withholding resources and information, failing to help colleagues, and sabotage. Where pay for individual performance is the primary means of reward within a highly interdependent team, this may be an incentive for individuals to try to exceed the performance levels of other team members through behaviours which detract from the group's overall purpose.

3.3.3.3.2. Training

In complex, changing environments where teams are involved in the development and execution of a unique outcome, it is unrealistic to expect a construction project team to contain all of the skills that it needs to achieve its task at the outset. Although it can offset this situation by bringing in new members at critical points, this may be counter-productive if it upsets sensitive team processes. Alternatively it can accept that a key team activity must be to plug skill gaps as they emerge during the project's life-cycle (Katzenbach and Smith, 1993). Senge (1990) emphasises the importance of team learning which, he suggests, is a function of incisive thinking about complex issues, innovative co-ordinated action, and the inculcation of team learning skills throughout the parent organisation, often by the teams themselves (1990: 236-237). Team learning is a discipline which is grounded in self-reflection and inquiry (Senge et al, 1994). Only when a team is synergistically united behind a common vision will it have the confidence to identify its limitations and look for

innovative ways to overcome them. Central HR Development functions should therefore work with the team leader to nurture reflection, dialogue and shared understanding within the team and, subsequently, provide the training and technical assistance asked for by the team as it learns to self-diagnose its deficiencies.

3.3.3.3.3. Privilege and Status

The idea of hierarchical career progression dominates control-based organisations (Lawler, 1992). Large firms with narrow spans of control breed tall hierarchies. Of course, a hierarchical approach is not incompatible with the motivation of high-performing, achievement-oriented individuals who can see a linear career progression upward through the organisation, with each promotion accompanied by increased status and reward. In project management organisations which consist of large numbers of technical and professional managers, we would expect to find a flatter organisational hierarchy with careers based on lateral moves through a matrix of challenging roles. However, if a project organisation utilises a hierarchical system of reward based on highly visible status and privilege differences this can be divisive. This may be exacerbated where teams are composed of members performing roles of similar value but who have different amounts of positional authority and status.

Messé et al (1992) provide empirical evidence which supports the hypothesis that investing certain members of a team with superior status can have negative consequences for group performance. Drawing on role theory (e.g. Biddle, 1979) and schema theory (e.g. Hastie, 1981), they suggest that merely providing individuals with an external symbol of status can generate role-consistent behaviours in them (Messé et al, 1992: 208). In a research study which compared the performances of teams where certain members were imbued with more status than other members (although no real power or additional responsibility) with teams where all members were equal, Messé et al (1992) found that "in group settings the sense of privilege

associated with supervisor status tends to decrease effort expended at tasks shared with subordinates" (1992: 213). The explanation for this phenomenon is said to reside in the tendency for individuals with superior status to inflate the value of their own worth and undervalue the contribution of their subordinates: it is clearly expressed in the phrase, "people do things for me; I don't do things for people" (Messé et al, 1992: 209) which, quite clearly, is the antithesis of teamwork ideals.

Some organisations have consciously attempted to create an egalitarian culture which de-emphasises status. Rover, for example, is well known for the simple, grey uniform which is worn by all management and production staff to symbolise equality. *Conorg*, on the other hand, has a long-standing career progression structure which is based on the acquisition of new status symbols. This is gradually being eroded but there are enduring stories (or myths) of, for example, a past manager who had to have a foot of carpet cut off all around the perimeter of the office he had just acquired because he was not sufficiently senior to warrant wall-to-wall carpeting! It is therefore hypothesised that symbols of privilege and status which are developed by the parent organisation to meet the career aspirations of individuals will have a negative effect on team climate.

3.3.3.3.4. Performance Feedback

In Hackman and Oldham's original job characteristics model (1980: 90), positive work outcomes are influenced by the extent to which job-holders have knowledge of the results of their work. Knowledge of results is itself directly affected by the amount of feedback available to those doing the work. With objective feedback, an individual "knows and understands on a continuous basis, how effectively he or she is performing the job" (Hackman and Oldham, 1976: 257). Performance feedback is a continuous process which is intended either to reinforce positive task performance behaviours or, where necessary, to correct inappropriate behaviours. Where

individuals are unable to see the end results of their work - on an assembly line, for example - tasks should be interrupted because this induces a feeling of psychological completion (Lewin, 1951). In a team environment, opportunities for feedback can come from within the team, but this is unlikely to be sufficient until team members have learned how to give and receive critical feedback in a blame-free way (Todryk, 1990). Feedback of the results of a team's work is intrinsic to the execution of a construction project, as a building visibly evolves from design concept to physical structure. The use of planning techniques, and the introduction of cost/productivity measures such as Earned Value Analysis, and quality management systems (e.g. BS5750) all generate information which can give knowledge of the effectiveness of the development process. Rodgers et al (1993) argue that feedback is predictive of job satisfaction as well as performance, citing Loher et al's (1985) and Fried and Ferris's (1987) meta-analyses which both estimated the observed impact of feedback on overall job satisfaction to be $r = .29$ (Rodgers et al, 1993: 431).

3.4. A Model of High Performance Project Team Design

The purpose of this chapter has been to develop a model of high performance team work design which is relevant to the experience of teams involved in (construction) project (management) work. In particular it has sought to challenge the theory and practice of work design as a mechanism for maximising value creation within stable labour processes and extend its application to project management which is a discipline increasingly concerned with the management of change (Management Consultancies Association, 1993). Using an open systems approach the model proposes that high performance is defined by the perceptions of customers who receive and assess the value created within the labour process. In construction project management, what determines the success or failure of the project is the customer's perception of the quality and quantity of value added to the product during the development process.

In construction project management value is added by the team during the development process. The nature of project team working is both intellectual and relational. It is intellectual in that it requires the team to find novel solutions to complex problems, and it is relational because it requires co-operation and interaction with other teams who also participate in the development process. Although it is argued that positive team processes (or team climate) will have a beneficial effect on inter-team relationships, the theoretical and empirical focus of this research is the performance of the construction project management team, measured by its ability to create value both for the customer (satisfaction and productivity) and for the parent organisation (income and productivity).

Value is created from the separate and collective performances of team members. Construction project teams, in accord with most project teams, are temporary organisations which exist to meet a specific purpose. Their temporality, the complexity of their task and the demands of their customers require that construction project teams are required to deliver ever increasing levels of performance. The creation of a climate in which the team is oriented towards its maximum value creation capability is hypothesised to depend upon intervention at three levels of design: leadership, team organisation and orientation. Work design is therefore considered to be a *multi-level* construct which generates processes, activities and behaviours that add value for the customer and which is therefore a critical contributory factor to the success of construction project teams.

The next chapter will discuss the epistemological and methodological approach that will be used to examine the strength of the relationships in the model of high performance project team work design presented overleaf. In particular it will discuss how choices were made concerning the type of data to be collected given the context and development of this study *within* the research environment. The focus of

the second third of this study will therefore be to present a research design which can be used to examine the following research hypotheses which have been extracted from the research model presented below:

H1. A positive team climate will have a positive effect on customer satisfaction, team productivity and project income.

H2. A positive team climate will have a moderating effect on the perceived complexity of the project.

H3.1. A positive team climate will have a positive effect on team member internal work motivation and job satisfaction.

H3.2. High levels of team member internal work motivation and job satisfaction will have a positive effect on customer satisfaction, team productivity and project income.

H4. An enabling organisational environment achieved through design will have a positive effect on team climate.

H5. An enabling organisational environment achieved through design will have a positive effect on project performance

H6. An enabling organisational environment achieved through design will have a positive effect on team member internal work motivation and job satisfaction

H7. Team leaders' ratings of leader practices, team organisation and team orientation, team climate and job satisfaction and internal work motivation will be more favourable than the assessments of team members.

It should be noted that for the sake of clarity and brevity the seven hypotheses above refer only to relationships between the major variable groupings such as that between an enabling organisational environment achieved through design and team climate. The process of data collection and analysis will, however, consider all of the relationships in the model, for example, between each of the five leader practices and the facets of team climate.

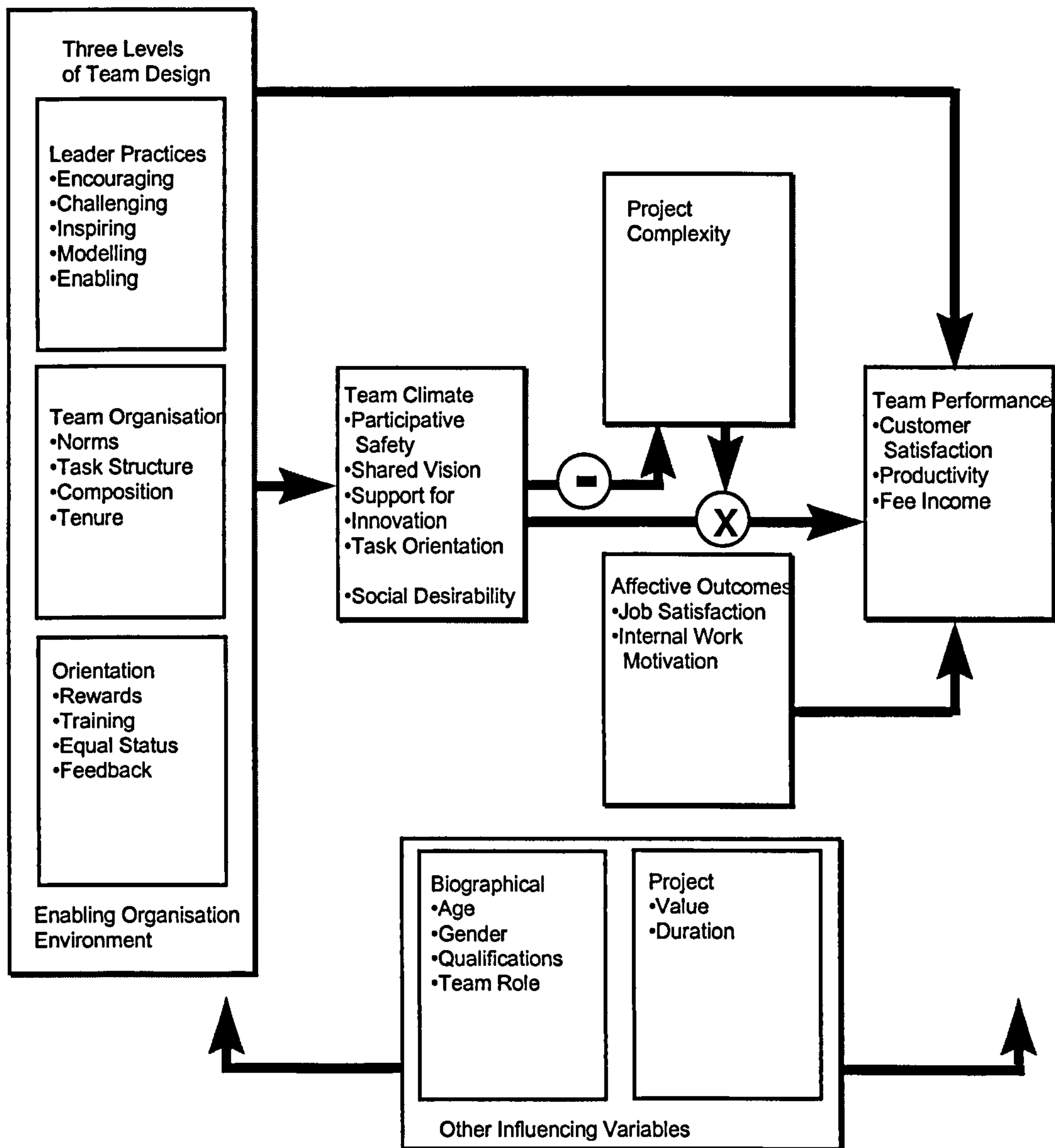


Figure 3.5: A Model of High Performance Project Team Design

4.0. RESEARCH DESIGN

4.1. Introduction

Chapter three concluded by presenting an open systems model of high performance team design and seven research hypotheses drawn from predicted relationships in the model. This chapter explains how the model was empirically tested. It describes the epistemology which guided the research design and presents the measures that were used to detect and record the phenomena that were to be observed. In addition, the chapter considers the contextual events that preceded the research study. It is argued that this is crucial to a full understanding of the research study, not least because the writer was a full-time employee in the case study organisation.

4.2. Summary of Data Collected.

The hypotheses presented at the close of the last chapter predicted causal relationships between the design of project teams and the performances of those teams. To test the strength of these relationships it was first necessary to operationalise these definitions by forming measurable constructs and then to collect sufficient data to allow experimentation to take place. The measures used were in most cases well-established with proven reliability and validity. Figure 4.1. overleaf re-presents the model of high performance project team design, recast to show the instruments used and the sources from which the data was collected.

The data was collected from three primary sources. Firstly, data concerning team design, team climate, affective states and biographical data was collected directly from 243 members of 49 project teams in a composite questionnaire. Secondly, data covering project complexity and customer satisfaction was gathered from the clients, or project sponsors, of the 49 teams, again using a single questionnaire. 38 client representatives provided usable data for 31 of the 49 project teams. Finally, data for two additional measures of project team performance - fee income and productivity -

was obtained from the case firm's Income Analysis records for each of the 49 teams, along with data for project duration and overall project value. Together, this provided sufficient quantity and quality of data to examine the hypothesised relationships using multivariate analysis techniques.

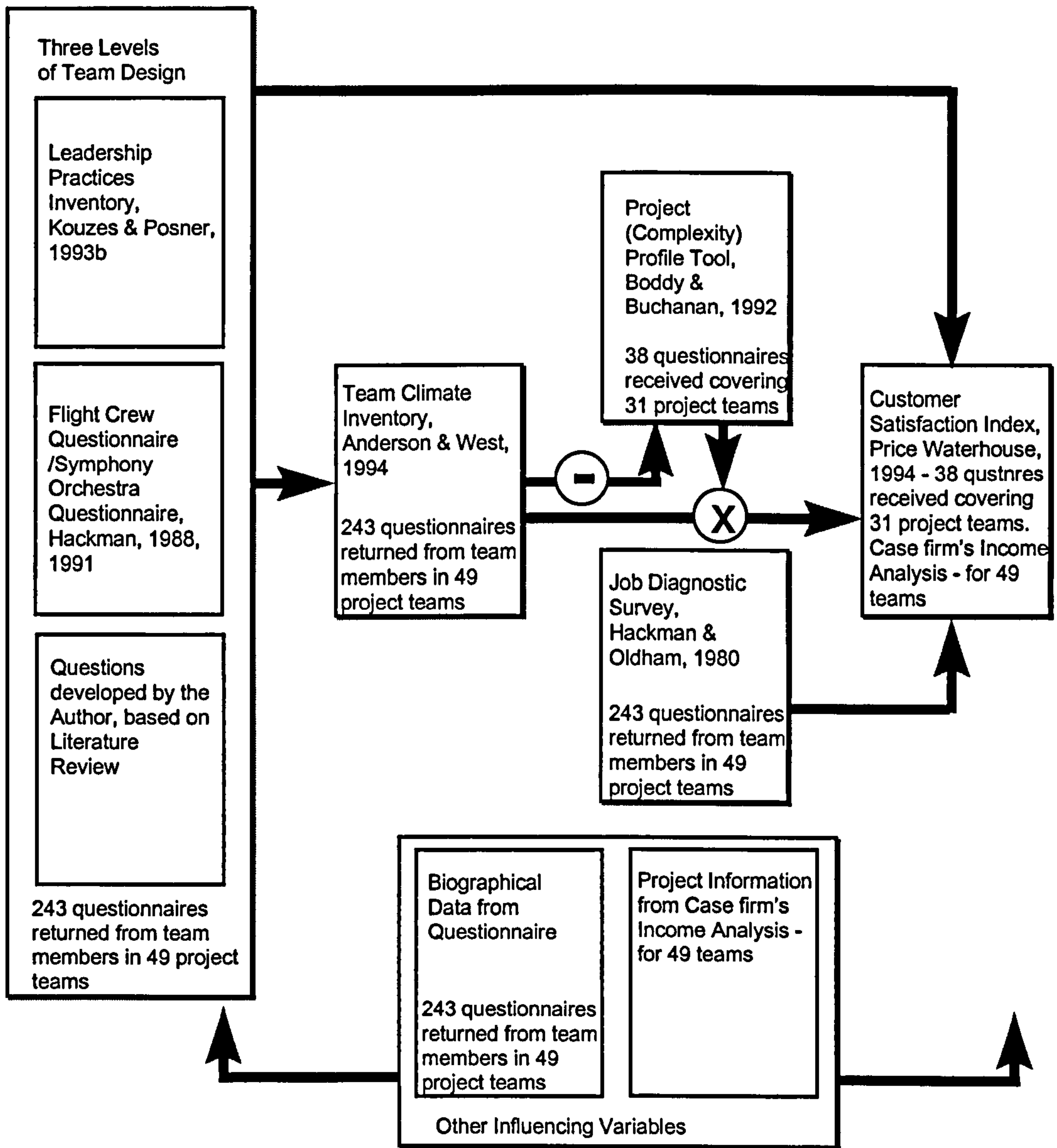


Figure 4.1: Measures, Instruments and Data Sources Used to Test the Relationships in the Model of High Performance Project Team Design

4.3. Contextual Analysis of Events Preceding the Empirical Work

This section will describe the events between 1990 and 1993 that preceded the empirical study within Conorg. Pettigrew (1985) notes how research ideas evolve in an incremental way through a continual process of negotiation between the researcher, the research environment and the subject of study. Because this research study is based on a single case-study experiment and the author was an employee of that organisation as well as a researcher, it is extremely important that an attempt is made to describe and analyse the events which converged to influence the subject of this study. It is equally important that the reader is given a clear picture of the organisation in which all of the empirical data was gathered.

The objective of this study was, from the outset, to examine the impact that work organisation design might have on contemporary organisational forms, notably project management. As the research question evolved it was apparent that its nature and content was being influenced by events within Conorg. Between 1990 and 1993, the pace of change within Conorg quickened and, for this period at least, the focus of much of the change activity was on work organisation design. Although by the beginning of 1993, work organisation design had been eclipsed in Conorg by other imperatives such as business strategy, core competence and organisational structure, the author's own interest in the potential of work design as a source of competitive advantage remained. This was compounded by an extensive review of the literature and the formulation of the hypothesis that work design should move beyond a narrow focus on individual motivation through changes in the task to encompass intervention at three levels: team leadership, team organisation and team orientation.

The narrative presented below describes the events which surrounded both the emergence and the demise of work organisation design as a focus of change within

Conorg between 1990 and 1993. The narrative is based on disparate data sources including minutes of meetings, company documents, discussions with individuals throughout Conorg who were influential in the change management process, together with the author's own participant observation and interpretation of events. The data has been fitted into a structure adopted from Pettigrew's pioneering work with the use of longitudinal case studies (Pettigrew, 1985; Pettigrew, Ferlie and McKee, 1992; Pettigrew and Whipp, 1991). The organisational context will be discussed first, concentrating on Conorg's history and the origin of the pressures to change the organisation of construction project management work within the firm. A further section will examine the process by which work organisation design climbed to the top of the change agenda and then subsequently faded away to become a peripheral concern. Pettigrew and Whipp's 'Change Pentagon' model will be used to organise this discussion of events (Pettigrew and Whipp, 1991).

4.3.1. History of Conorg, 1860-1991

There are few archival documents which describe Conorg's history and this is reflected in its employee population's relative lack of understanding of the company's past and the critical events which have shaped its present strategy, structure, culture and management style. Conorg originated as a general building company in the mid-19th Century. Located in London, its early development was uneventful. During the 1920s, however, it formed an association with a major retailer and introduced a fee system of contracting which was uniquely different from the traditional tendering system. Instead of submitting a tender price for a building construction which hid the anticipated profit margin, Conorg would in future build for the true cost of the construction and take a fee which was agreed at the start. This non-adversarial approach established a much closer relationship between client and contractor and provided the basis for further innovations in the contracting process much later.

Continued expansion during and after the second world war resulted in Conorg forming a new tender company to exploit the traditional construction market. In order to retain the distinct philosophy of fee contracting, the two companies operated in parallel isolation until 1973. In 1969, Conorg introduced Management Contracting into the UK which elevated the contractor to membership of the professional team alongside the architects and engineers. Management contracting organised the construction process into distinct packages of work, each of which was put out to competitive tender. This ensured both that costs were minimised and that specialist expertise could be bought in as required. No longer was it necessary for the contractor to employ all of the artisanal skills needed to construct a building. This was increasingly important as construction projects increased in size and complexity. In 1973 the tender company was sold off and Conorg committed itself to non-adversarial, management contracting. During the 1980s, it pioneered further innovations such as Construction Management and Program Management and by 1990 had shed the last remnants of its operative labour force.

Management contracting's propensity for fast-track construction enabled Conorg to win many of the major construction projects during the building boom of the mid to late 1980s. In 1990, the company had secured a £1.2 billion workload. Internally, the Chairman divested autonomy to the operating divisions allowing them to exploit the over-heated market for commercial property and retail construction. This Maverick operating style was successful and prospered in an environment of largely uneducated clients who demanded fast and not necessarily cost-effective buildings. Conorg's employee population doubled to 2400 people, many of whom had only previously worked for traditional lump-sum (tender) contractors. Because there were few company-wide systems and Conorg's work culture was based on behaviour learned through, for example, its extremely influential management trainee system, the influx

of new people served to dilute many of its core beliefs, customs, practices and ways of working.

The collapse of the UK construction market circa 1990 led the industry into its worst recession since the 1930s. Weakened by dependence on the commercial property construction sector, Conorg was sustained by its long-term relationships with several of the major retailers. Its response to the recession is discussed in detail below, but at a general level Conorg's strategy concentrated on overhead reduction, new product development and the continuation of the Chairman's programme of global expansion initiated in the 1980s. The value of its UK contracts fell by 41 per cent in 1991, compared to an increase in its US workload by 75 per cent, and an increase of 44 per cent in the value of its work load in Continental Europe. Although the effects of the recession challenged many of its fundamental beliefs, Conorg's culture still reflects several key themes in its historical development. In particular its continuing domination of retail construction has inculcated a primary obligation to on-time project completion and a highly task-oriented work culture, while its commitment to non-adversarial forms of construction and the striving for professional status and image relative to many of its more traditional competitors has provided a back-cloth to its move into new markets such as program management and consultancy.

4.3.2. Work Organisation Redesign in Conorg: a 'Phoney War'?

This section describes why and how work organisation design first emerged as a change management priority in Conorg in 1990. It describes the evolution of the concept from a focus on the design of individual roles to one which encompassed the totality of the project team organisation. It suggests that the purpose of the proposed redesign was to reduce the costs of construction by enlarging the scope of individual roles and responsibilities within the project management process. Although the design was not implemented as originally conceived, construction project teams were

increasingly downsized as a result of competitive pressures and this, ultimately, had the same desired effect: reduced costs and higher productivity. However, there is no evidence that client satisfaction with the final product has shown any positive improvement and may even have declined.

Although the recession at the end of the 1980s was the primary cause of the prolonged period of organisational restructuring that continued into the second half of the 1990's, the change management dynamic in Conorg was triggered by an internal report that the cost of construction in London was 30 per cent more expensive than in New York despite labour costs which were three-and-a-half times higher in New York (Temple, 1990). This report was supported by later industry-wide research (e.g. NEDO, 1991) and has since received national attention with the publication of the influential Latham Report (1994). The Conorg report was endorsed by the Chairman who empowered the report's author to implement its recommendations through a working party of executive directors. This group met monthly from October 1990 and its agenda reflected the target improvement areas identified in the report. These were: (1) measuring performance, (2) achieving more productive hours, (3) use of productivity improvers, (4) adoption of standard approaches, (5) making staff more capable and multi-skilled, (6) Mechanical & Electrical plant sourcing, and (7) other items.

Working parties were formed to develop an improvement strategy for each of the seven areas. The author was invited to participate as a member of the *making staff more capable and multi-skilled* improvement group (hereafter, MS group) in November 1990. The imperative for change in this area was the observation that United States construction managers were more flexible than UK managers "being able to prepare a detailed plan, prepare a cost estimate, buy out trade contractor packages, undertake engineering and supervise construction" (Temple, 1991). The organisation of production on a large construction project circa 1990 divided the

managerial labour process into the management of progress (project/contracts managers), of cost (quantity surveyors) and of quality (construction managers). These three primary functions were supplemented by additional specialists including planners, services and site engineers and project administrative staff.

The perceived need to redesign the managerial labour process within Conorg was considered important for two reasons. Firstly, it was recognised that the highly fragmented nature of the industry and the diverse educational and professional development routes of the specialist managers inhibited communication and decision-making within the construction project management team. And secondly, functional specialisation resulted in larger construction project management teams. As cost moved ahead of speed and quality as the basis of industry competition in the early 1990s, the necessity to reduce the size of project teams became paramount. As the recession began to bite cost reduction became the key driver for work organisation change.

Early in 1991, the MS group presented a revised construction project management job description which recommended that the hitherto separate management disciplines of cost, time and quality be integrated into a single, multi-functional role. This was an attempt to re-engineer the construction project management process, transforming jobs from being narrow and fragmented to being multi-dimensional and integrated. The proposed job re-design was purely technical in orientation and concerned the enlargement of individual roles. Neither the performance dynamics of the project team, nor the practicalities of moving a workforce of 1800 people to the new work design model, were considered issues at this stage.

But, in any event, the re-design of individual jobs was never implemented. A paper presented to the Directorate in February 1991 had referred to emerging fears about the detailed specification of the new role: "ROLE SPEC ROUNDED INDIVIDUAL

DRAFTED - CONCERN AT 'SUPERMAN' IMPRESSION!". Concern was also growing among the population of quantity surveyors who feared that they would be casualties of the redesign, particularly as their function did not exist as a separate discipline in the organisation of the construction project management process outside of the UK. As fears grew, job redesign was downplayed and a new emphasis on 'attitude change training' emerged. Minutes from the 4th February steering group meeting illustrated the shift in emphasis: the January subject heading, "making staff more capable and multi-skilled" had been replaced by "workshop", and the supporting comment referred to "[homing] in on suitable candidate to provide attitude coaching". The 8th April minutes noted the "concern... about lack of resolution on facilitator" (steering group minutes, 8.4.91), and by June this issue was still unresolved because of the cost of using a preferred external consultant (steering group minutes, 17.6.91). The same meeting recorded that "concern was expressed at the non-availability of suitable training to develop multi-skilling in our managers".

By August 1991, a new item had appeared on the steering group minutes: *organisation*. The minuted item is printed in full below:

"We must identify a project organisation to move to into 1995. This is the critical path in our initiative at present. With an agreed organisation concept we can develop and train staff for new roles, write procedures, develop IT systems to facilitate utmost efficiency and respond more specifically to press questions. It is impractical to organise a 'flexible manager' workshop until the organisation into which this individual will fit has been defined.

"Each operations division has been asked to take a recent project, understand the existing organisation, roles and total man hours; then develop their view of the organisation they would like to adopt in 1995 to carry out the same scope with half the number of man hours. The product of this exercise should be an organisation chart and text explaining the redefined roles".

The identification of a concept team organisation structure was a critical departure from the earlier focus on the individual job role and reflected a realisation that the desired improvements in performance (cost reduction and productivity improvement) were achievable at the level of the project team rather than at the level of the individual. A memo to the Chairman later in August stated that "each division had been asked to develop a concept organisation for 1995 for a past or existing project which will achieve the required 50% staff manning level". Although multi-skilling and the integration of traditionally separate roles was still on the agenda at meetings, it was increasingly clear that the focus was turning to project organisation and its impact on cost and manning levels. The minutes of the September steering group meeting, for example, specified target cost and manning improvement projections for three divisions. This could be achieved on a £30 million construction management project by reducing staff numbers from seven to four but "would be contingent upon no excess administrative requirement from the client's financial advisers, utilising trade contractors requiring no support [/supervision] and high staff quality".

By October 1991, a working group had produced a three-stage organisation model for a £20 million construction management project. Stage one showed the existing organisation with 16 team members segmented into financial (4), construction (5), project (2), planning (2), services (1) and administration (2) roles. Stage two reduced the number of team members to twelve by integrating the cost and project management roles and limiting the number of construction managers on-site, which implied transferring more control over production to works contractors. The 1995 target organisation (stage three) proposed that eight team members would manage a £20 million project. Two assistant project managers, two construction managers, a cost/schedule manager, an information manager and an office administrator would all report to the project manager. A training plan was endorsed which consisted of a one day training course for project Sponsors who would be responsible for co-ordinating

the transition on-site, and a "one week foundation course [for] a new [Assistant Project Manager] role" (steering group minutes, 5.11.91).

There is some evidence that project managers were actively trying to redefine their project organisations during this period. A memo from a project manager in Norwich stated that "I support the view that many of the additional skills will be acquired by the right project staff structures, mixing disciplines to create accountable sub-teams, within the overall [project team]. This is best related to areas, levels or buildings rather than package related. The cross fertilisation of disciplines will help breed the multi-skilled individuals". His project did experiment with the formation of small teams of construction, cost and project managers who were responsible for geographical areas of the shopping mall development, but it was short-lived. Another experiment with the reorganisation of roles was performed on a major office development in the City of London. When compared with a project of similar complexity built several years earlier, it was recorded that there was a 40 percent reduction in manning levels on the later project. Of the six team members on one phase of the project, the assistant project manager also acted as financial controller and buyer while the two assistants to the construction manager started by being involved in procurement and gradually transferred to site supervision as the project progressed. But despite the publicised success of this project and evidence of considerable improvement activity there was no general feeling that a widespread revolution in project work organisation was underway.

The publication of the 1990 report on the comparative costs of construction in the United Kingdom compared with New York, and the conclusion that this was largely a function of the different approaches to construction project management work organisation in the two countries, was a significant driver for change within Conorg from mid 1990 until the end of 1991. But as the recession began to deepen and competitive pressures forced costs down, the original intent to train construction

project management personnel for broader roles within a new concept project organisation was overtaken by the need to reduce the price of project teams. Between 1990 and 1994, Conorg reduced its personnel base from 2400 to just over 1000 people. The roles of project personnel who stayed with Conorg remained similar to those they performed prior to 1990; the only difference was that the size of the job was bigger. Productivity had increased by as much as 100 per cent, but not as a result of a sophisticated redesign of the construction project management process: essentially, where there had been two surveyors, now there was one.

It might be argued that the period between 1990 and 1991 was a 'phoney war'. The focus on the effectiveness of the construction project management process and the creation of a change management infrastructure of steering groups and working parties masked an inertia which was fuelled by an unwillingness to accept the need for fundamental business review and transformation. But if the organisation's interest in redesigning the organisation of project management work was simply an interlude, then it was an interlude during which the author was stimulated to explore the possibilities that work organisation design might have on the performance of project teams. During this period the hypothesis was forming that the application of work organisation design principles could significantly enhance the value-adding performance of project teams.

4.3.3. Process Issues: 'Getting to California...'

At a presentation to Conorg senior managers in 1992, Professor Andrew Pettigrew described the route to high performance as being analogous to the early American settlers 'getting to California'. He stated that embarking on the wagon train in the East was no guarantee of arrival in California. Within organisations, social phenomena such as inter-group conflict, goal divergence, corporate politics, game-playing, group-think and paranoia all serve to prevent the change process from

achieving its original intentions. Key to successful change is a capacity to generate energy, to sustain it, and to prevent regression (Pettigrew and Whipp, 1991). To provide further context to the empirical study, this section will explore the process of changing within Conorg from four perspectives: coherence, leadership, people as assets as liabilities, and linking strategic and operational change (Pettigrew and Whipp, 1991). Throughout, it will use the work organisation change initiative as the fulcrum of discussion and analysis. A time-lines diagram is included on page 131 in order to summarise the inter-relationships between the events described in the four sections below.

4.3.3.1. Coherence

Coherence refers to the ability to hold strategic thinking together over time. 1991 witnessed considerable coherence in policy and thinking. The steering group's agenda reflected the recommendations for change in the original research report. Activities were drawn from the subject headings, investigated and expanded. The onset of recession, though was stimulating a general questioning of the effectiveness of the organisation. At a communication meeting in December 1991, Conorg's Chairman presented several new change initiatives: greater movement of people around the organisation, the creation of centres of excellence for specific markets, the recruitment of people with specialist skills, the need for new skills and personalities at Board level, and the creation of a think-tank comprising younger members of staff, and the beginning of the integration of the UK and International companies. The Chairman restated that Conorg would stick with the company's fee philosophy of non-adversarialism, but that research was taking place to see if this could be reconciled with offering clients greater project cost certainty.

In March 1993, Andrew Pettigrew was retained to chair a one-day workshop on the management of change with the Directorate (12.3.93). As a result of this exercise

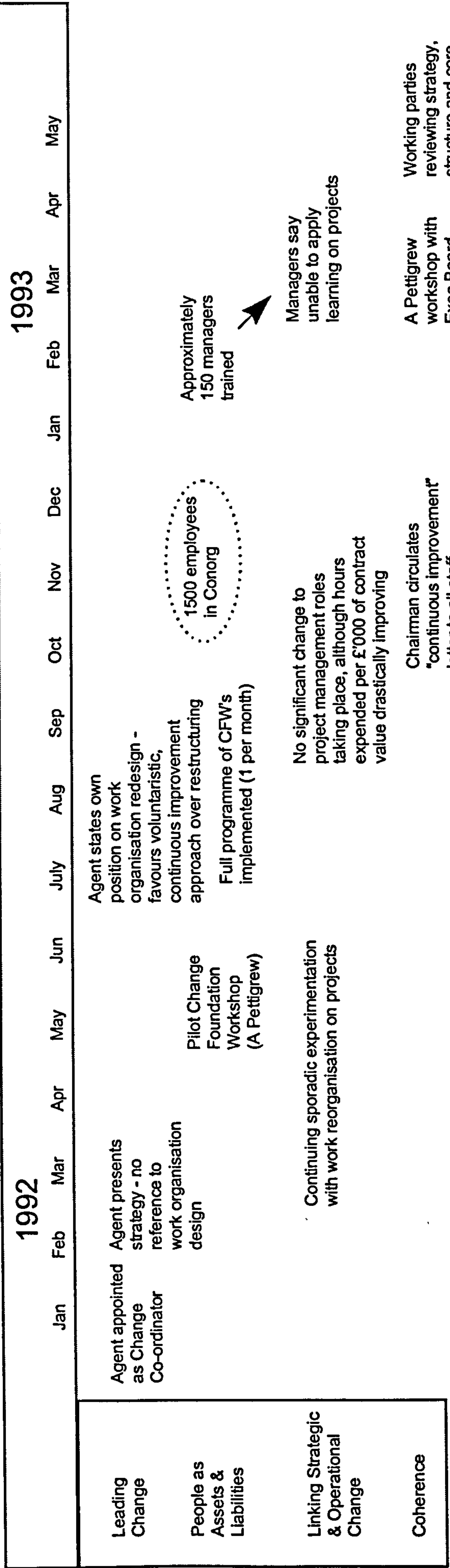
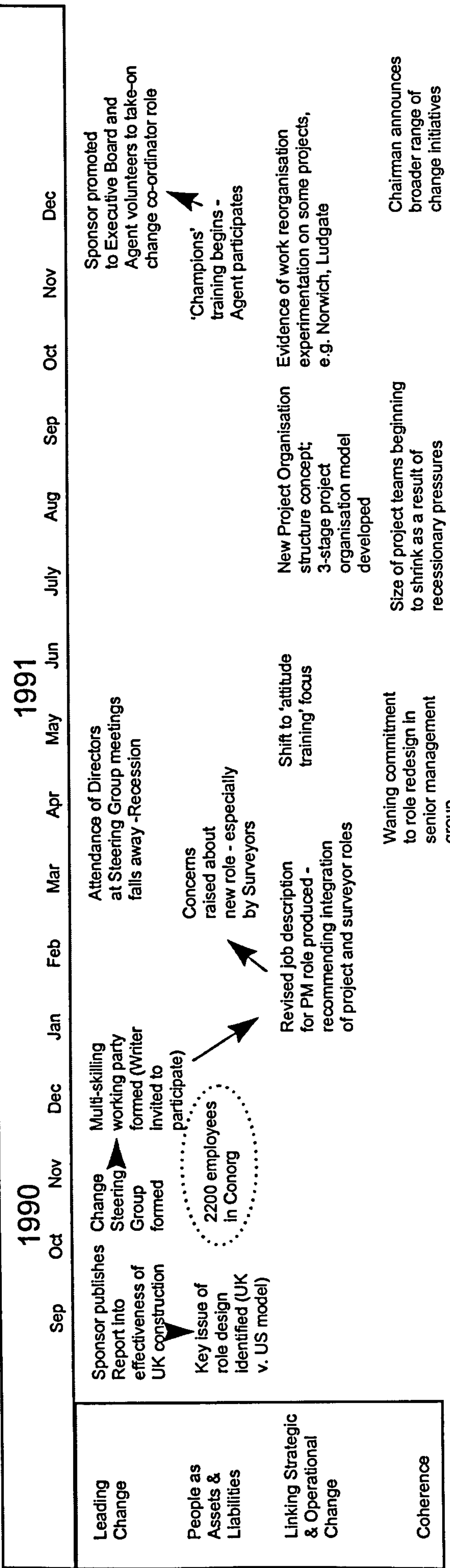


Figure 4.2: Time-Lines Diagram Showing Principal Events in Conorg that Preceded the Empirical Work, 1990-1993

three working parties were formed to examine corporate strategy, structure and skills and knowledge. The strategy group reported to the executive Board on 31 April 1993 that "we cannot continue as a major construction company unless we find profitable new markets". The group recommended that new sectors should be targeted and changes made to the organisational delivery system. This included changes to organisational structure and governance, and the introduction of new skills into the business. This report was subsequently integrated into the five year business plan. Between April 1993 and August 1994 a series of changes were made to the company's organisational structure which culminated in the appointment of a new Managing Director, the formation of a European Board, and the transition from a divisional structure based in London to a more autonomous business centre structure organised by regions and/or clients which was intended to increase Conorg's sensitivity to existing and potential customer needs.

4.3.3.2. Leadership

The change programme was co-ordinated by a steering group of Executive Directors working under the chairmanship of the author of the research into the effectiveness of UK construction (hereafter, Sponsor), but their commitment to his vision was limited by their own divisional interests and concerns, predominantly securing a sufficiently large workload to maintain or enhance their own relative positions in the Board room. This is not to say that they did not give him any support: tasks set were generally carried out, but without vigour and energy. The business imperative to win and then deliver contracts stifled the change programme; innovation and improvement was secondary to winning and executing new projects. The task-driven culture meant that the responsibility for the implementation of the change programme remained in the hands of Sponsor and a small inner circle.

In November 1991, Sponsor's perceived success led to him being promoted out of his role leading this change process and onto the Board as a non-executive Director. Although Sponsor did not relinquish control immediately, the December steering group minutes reported that "co-ordination of the initiative was being reviewed". Sponsor's replacement (hereafter, Agent) volunteered to take on the role of change co-ordinator after attending the first 'Champions' workshop which was designed to spread ownership of the change programme. However, because Agent applied direct to the Chairman and by-passed his own line-Director, this created an uneasy relationship between the two men that resulted in a withdrawal of support for Agent's subsequent activities.

Agent was appointed co-ordinator on January 9th 1992 and in February he presented his strategy. His nine section document emphasised communication, bench-marking, training, systems, presentation and partnership in achieving improved levels of performance. Work organisation design - either at the level of the individual or the project team - did not feature prominently in his strategy. A newsletter, first published in March 1992, typified the changing emphasis, containing features on total quality management, trade contractor involvement, good housekeeping and a new knowledge database of information on all standard trade packages.

There is circumstantial evidence that the new strategy was perceived to be unclear, possibly because it was broader than Sponsor's focus on work organisation. A memo from two members of the new 'think-tank' stated that "we believe our initiative needs new direction and that certain existing ideas need redefinition". A second memo sent later in the month from the same source urged that "we need to raise the profile of the initiative otherwise it will stagnate". An important part of Agent's strategy was the programme of Change Foundation Workshops which were designed to help individuals understand their role in the change process. Feedback from a pilot

workshop for project managers in May 1992, however, suggested that the earlier anxiety associated with the new multi-skilled roles was crystallising; concerns were raised about "one person doing two persons work", "threats to staff job security", "no adequate role for [company] surveyors", "no milestones to target" and "lack of commitment by the main board".

Agent had not been actively involved in the first phase of the change programme and had no loyalty to Sponsor's vision. He leaned towards Total Quality Management (TQM) and was supported by some senior managers, although there was concern at the implementation costs of a full-blown TQM programme. Conorg's sister company in the USA had reportedly invested millions of dollars in a TQM programme without reaping significant measurable benefits. This assumption was subsequently shown to be largely unfounded but it had nevertheless sown seeds of doubt about the costs and benefits of TQM in the minds of the Conorg Directorate. It was also typical of the intuitive style of leadership which elevated the subjective over the objective. The influence of important clients like Hewlett Packard led to experimental business process modelling, but the prime motivation here was client relationships and the prospect of future contracts, not the search for improvement. The TQM debate continued and it was decided to opt for a programme of continuous improvement which was grounded in the voluntary activities of local enthusiasts and improvement groups. In October 1992, Conorg's Chairman wrote to all members of staff as follows: "We are under no illusions about the challenge we face. I therefore request your ongoing ideas and participation. The key is that every time we do something, we find a way to do it better than last time".

Despite the demise of the work re-organisation initiative at policy level, there was some evidence of a hangover effect at operational level. One division's review of 25 projects progress in introducing change indicated that genuine attempts had been

made to apply new working practices. Comments from the project managers of five projects included: "training and role interchange created sufficient multi-skilled abilities to cover during holiday absences", "open plan office arrangements have improved communication", "site managers have been involved in pre-tender work and valuations to give them basic knowledge in these areas", "[site] seminars have been held on earned value analysis and personal development planning", "forming area teams and placing [specialists] in work groups has [led to] a big improvement in team attitude" (July 1992). But there was no consistency of approach and by the end of July it was becoming clear that the redesign of project organisation structures and roles was no longer a key element in the change programme. Two memos from Agent summarised his position and set the tiller for the next phase of the change programme:

"At the end of 1995, I estimate that only 25-30% of our workload will give opportunity for the new [project organisation] structures, leaving the much larger proportion of our workload to be structured much as it is today. We are currently tendering at staff levels 25% less than 1990 partly due to [our own] progress and partly due to commercial pressure" (Agent, 9.7.92).

"The 'rounded manager' is not clearly defined. The [stage one, two and three] structures are now being proved inadequate. We are already at or beyond [stage two]. The 1995 [stage three structure] is recognised as inappropriate to management contracts (still a mainstay of our workload) and job descriptions were not prepared for [stage three]. The speed of introduction, the numbers of people who are to change, the opportunity to put into effect on new projects - all remain largely undefined. All at a time when the market-place has changed beyond anything envisaged when [the change programme] was first created" (Agent, 27.7.92).

Whether it was the change in leadership or the volume, complexity and momentum of changes in both the internal and external contexts, it was clear that work organisation was no longer considered to be the key site of competitive advantage. Costs were being driven down through 'natural' competitive pressures as construction project management work was intensified. The concept of the 'rounded manager', while attractive to many, was also a threat to others. The leadership of the change programme during the first phase of the transition - the 'phoney war' - had used the rounded manager as a symbol of change, but the reality was that roles and relationships continued much as before. The new leadership recognised the escalating spin of change (Conner, 1992: 100), and that placing all eggs in the work organisation basket was dangerous. The gradual shift to continuous improvement between January and July 1992 recognised the ambiguity of change and the need to adopt a pull, rather than a push style of change management, which was built on widespread understanding and commitment.

4.3.3.3. People as Assets and Liabilities

The role of people in both inhibiting and facilitating the change to a more productive form of work organisation was recognised from the outset. Firstly, there was a concern that "the organisation will need to absorb the rounded individual" (Sponsor, 15.1.91). Sponsor had recommended that a new division of 'rounded managers' should be formed and used to resource projects and their output compared with traditional project teams but this was rejected as being elitist and divisive. Secondly, there was evidence that the Personnel department was slow in responding to Sponsor's programme for the identification of an external facilitator to provide 'attitude coaching'. The February steering group minutes recorded that "Personnel is examining further candidates". By April there was "concern about the lack of

resolution on the facilitator". As the year passed Sponsor became more frustrated and during the October meeting Personnel was openly criticised for the "non-availability of suitable training to develop multi-skilling in our managers" and its failure to raise awareness of the change programme "out there".

By the end of 1991, however, some tangible progress was being made. Each of the operating divisions had prepared a list of people believed to possess the potential to develop into 'rounded managers'. A proposal from the Training department to lead the managers through a modular development programme comprising training in both 'soft' skills and technical skills and culminating in job change and the award of a new title (Assistant Project Manager) was tabled but never implemented. As the pendulum swung from a structured work reorganisation intervention to a more voluntarist continuous improvement programme, the emphasis turned towards 'Champions' workshops and 'Change Foundation Workshops'.

The Change Foundation Workshop was a radical departure from existing training in Conorg. Its emphasis was on personal change and was an opportunity for managers to assess and re-evaluate their personal contributions, as well as their quality of work life and general work satisfaction, before committing to a personal development plan. Initially, the personal development plan was linked to the idea of *becoming* the new rounded manager, but the absence of new work organisation structures back at work prevented sustained change. Feedback from the course regularly referred to the 'brick wall' that managers faced upon return to work, although some senior managers were adamant that the new structures and working practices were already in place on many projects.

The change programme also suffered from a general reluctance to commit necessary resources to ensure that all staff could attend the programme in a reasonable time-

scale, thereby generating the energy needed to sustain a change in culture. Although 450 staff eventually attended the Change Foundation Workshop, this took three years and during that time the course evolved into a different product, delivered by a different combination of facilitators. Nevertheless, the course did have a positive impact on attitudes and behaviours across the company as a whole, helping to smooth the transition to a work culture which could deal more capably with uncertainty and constant change. A version of the course was also held for senior managers but it was telling that only the Chairman and one other main Board director attended the close of the course to listen to the group's assessment of the direction that the change should take, despite all being invited.

4.3.3.4. Linking Strategic and Operational Change

Sponsor's withdrawal from the leadership of the change programme and its new leaning towards continuous improvement shows how strategic intentions can be transformed over time (Pettigrew and Whipp, 1991: 199). The nature of work *has* changed for many individuals in Conorg as business opportunities in new areas of consultancy and program management have emerged. However, the organisation and management of construction project teams has changed very little, apart from the size of teams which is generally much smaller than in the pre-1990 era. The main role groupings of quantity surveyors, contracts managers and site managers remain solidly entrenched. Because construction projects are smaller and the average number of team members has also been reduced by as much as 100% some individuals have become 'rounded' by default or from necessity. Because of this, performance improvements have been attributable to the intensification of work, rather than a result of innovation in its organisation.

During the first stage of the Change programme, the leadership had a clear vision of how the future organisation would look: a core of multi-skilled project management professionals able to manage projects more efficiently than was possible under the traditional and highly fragmented work organisation model adopted by their competitors. Although this vision was shared by many people working closely with Sponsor, synergy did not extend into the organisation as a whole. With the arrival of Agent, much more effort was expended in helping individuals understand and cope with the pace of change. The Change Foundation Workshop, for example, gave people the opportunity to express and be open to new learning and ideas, and to explore the frustration and confusion that they were individually living through, while harnessing their shared experiences and thus building synergy.

4.3.4. Conclusion

From the author's perspective it was apparent that the change in emphasis was right, that a new job description was an insufficient prerequisite to build the motivation and abilities needed to fundamentally change the performance of Conorg. But it was equally apparent that the energy and commitment that was being generated on the Change Foundation Workshop was not being converted into new and more effective patterns of work and social relationships back in the project team. Although by the end of 1992, work organisation no longer held centre-stage, *the author had developed a strong interest in understanding how work organisation design might be applied to enhance the performance of project teams involved in the management of complex tasks.* The model of high performance that was beginning to emerge was influenced significantly by the author's experiences of the change process within Conorg during this period. The following learning was particularly important.

In Project Management the team design stage is a core business process because it is the point at which the client need has been articulated and encapsulated within a proposed work organisation unit as an amalgam of skills, attitudes and behaviours. When set to work and given energy, it is this design which enables value to be added to the project development process. This has two implications. Firstly, if strategic HRM is genuinely characterised by a link between a firm's business strategy and the deployment and utilisation of the human resource (Purcell, 1995: 63), then HR activities in a project management organisation should focus on and support this core process. And secondly, because the project management organisation is characterised by extreme fluidity as projects are won, implemented and terminated *ad infinitum*, work organisation design is viewed as a continuing and renewable activity. This contrasts with the more stable production environments in, for example, manufacturing industry supply chains.

If Human Resource Development programmes are used as part of an organisational transformation intervention to change individual skills, attitudes and behaviours without an accompanying change in the work environment, the experience of Conorg shows that this can have limited organisational impact and may even be potentially dangerous if expectations are raised and not fulfilled. The work environment must provide the context in which new skills and behaviours can be applied and, because the project team leader exerts considerable influence over the team environment (or climate), leadership style, and particularly, the willingness to challenge existing knowledge, assumptions and work performance norms, can provide the foundation for creativity, innovation and value-adding performances within the team. Moreover, if team leaders and their team members are to be encouraged to change or adapt their existing behaviours, there must be visible, practical and sustained support provided by the corporate organisation. Training and rewards which support team working,

and a career structure which removes artificial barriers to co-operation and participation, can help stimulate behaviour change.

The analytically-structured narrative presented above describes the change process within Conorg and its effect on the development of the research ideas, subject of study and hypotheses. This phase of the research programme constituted a time of theory-building in which the writer made explicit the relationship between work organisation design and project team performance by developing a taxonomy which could be tested within Conorg. This was not a rational-linear process that proceeded from description to taxonomy and then to testable causal propositions (Breakwell, 1995). But it contributed to the development of a model of team performance which is relevant to the environment in which it formed, as well as being consistent with the type of research that it has been suggested will extend our understanding of the determinants of group effectiveness (e.g. Goodman, 1986; McGrath, 1987).

The structured narrative of the context, content and process of work organisation change in Conorg during the early 1990s provides a preamble to the taxonomy of high performance project team work presented in chapter three. If the constructs contained in the model are derived from the review of the literature, then the choice of those constructs and their relative positioning is itself a reflection of the author's immersion in, interaction with, and interpretation of events in Conorg during the life-cycle of this study.

4.4. Research Design, Level of Analysis, Sampling and Representativeness

This section will discuss the precise nature of the research design as it emerged during the period of theory-building described in the first part of this chapter. It will explain why a single case experiment was preferred to other methods of data

collection and, in particular, why it was believed this methodology would be particularly relevant in studying the factors that influence the performance of project teams. The section will then consider the level of analysis adopted within the case organisation, which is the project team. Finally, the section will consider the possibilities for generalisation outside the single-case to the wider project management environment.

4.4.1. Research Design: the Single-Case Experiment

The case study methodology is widely used in management research for studying phenomena such as organisational change (e.g. Pettigrew, 1985). However, single case *experimental* designs are less popular because of the difficulty of inferring a general law from particular circumstances. Nevertheless, it is argued that the choice of the single case experiment is a robust research design for a work that seeks to construct a general theory of project team design from an empirical study of a group of teams involved in similar performance activities in a single organisation. Three reasons are especially powerful:

1. the limitations of the group design in organisational research, particularly the confounding effects of cultural differences across different subject groups
2. the need to study real work groups that share similar task and contextual experiences
3. the rich opportunity afforded by the writer's unlimited access to data within Conorg.

4.4.1.1. Controlling for Confounding Variables

Wilson (1995) identifies several difficulties and weaknesses in the group research design which supports the decision to use a single-case experiment. In any group of

experimental subjects it may be possible to control for particular variables (e.g. team size, age, tenure, etc.). However, the group would be entirely heterogeneous for other factors which could interfere with the analysis of the principal relationships. "This would lead to differences in treatment outcome within the group and the average response would not reflect any individual in the group" (Wilson, 1995: 71). This problem arises because it is extremely difficult to achieve a genuinely random sample which is truly representative of the whole population being investigated. We can never be absolutely sure that what is true for our sample is true for the population as a whole.

Because the case study is a multi-site organisation consisting of many temporary and autonomous sub-organisations (i.e. project teams) it was felt that this would allow the examination of a large number of teams while at the same time controlling for the impact of the troublesome culture variable (Hofstede, 1980; 1991). In contradistinction to the multivariate, empirical analysis of large samples of organisations pioneered by the Aston school (e.g. Pugh and Hickson, 1976), Hofstede (1980) appreciates that cultural values have implications for the way that organisations are structured and managed. He controlled for the effects of many organisational effects by sampling within a single organisation, IBM, producing a case study of national divergence in cultural values. The research design is similar here in that it uses multivariate statistical procedures to examine the architecture of work organisation across a reasonably large sample of cases (teams) within a single organisation and is therefore sensitive to concerns about "the extent to which agreement or climate perceptions can be demonstrated across different organisations, characterised by quite different sub-cultures, departments, roles and hierarchical levels" (Anderson and West, 1992). This also explains the reasoning behind the decision to exclude other construction industry 'parties' involved in the project development process from the study: architects, who are "artistically inclined",

engineers, whose "professional culture is centred on technical matters" and quantity surveyors, whose "vision is strongly polarised towards the cost aspects" (Matthews, 1992: 31).

4.4.1.2. Studying Real Work Teams

Secondly, and closely related to the first point above, there is a need to improve the quality of group research by studying real work groups engaged in similar tasks who share broadly similar contextual experiences, such as exposure to corporate communications, management style, reward systems, and so on. In terms of the epistemology of group research the approach adopted here follows McGrath who argues that "we must somehow get information on lots of cases that are somehow 'the same' (that is, comparable) and combine that information over cases" (McGrath, 1987: 380). By controlling for the impact of organisational culture, while collecting data from a relatively large number of cases, we can increase our understanding of the (uncontaminated) effects of, for example, changes in leadership style on team climate.

4.4.1.3. Access to the Case Organisation

The third reason for adopting a single case experimental design is more closely aligned with the research tradition of phenomenology rather than positivism. The extent of the access made possible by the author's role within Conorg meant that the data source was potentially very rich. This had a number of implications. Firstly, it was possible to develop a taxonomy of team design which was strongly contextual and processual. The context in which the model was developed has already been discussed. The process of development involved on-going, ad hoc discussions with members of the organisation about the factors that they believed to be influential in

improving the performance of teams and the satisfaction of team members. This perspective facilitated insight into the challenges and issues faced by the organisation and its sector, together with a critical awareness of the quality of the data available and its location within Conorg. A final point is that it would have been impossible to reproduce this level of access in other organisations in the same sector.

Of course, this level of access is not unproblematic and the problem of bias or of contamination of the data because of my immersion in the case study environment was a potential threat to the integrity of the research. Pettigrew (1990), for example warns of the danger of over-involvement and going native. "Researchers are in the perspective business... The researcher has the privilege and benefit of listening to all sides of a drama. With that privilege comes the scientific and ethical responsibility to present all significant views before offering the researcher's perspective" (1990: 278). This factor was central to the decision to use the questionnaire survey as the principal means of data collection within the organisation and to use items which had been previously validated by other researchers, albeit within the framework of a model developed from inside Conorg. Although it might be argued that the researcher can never be entirely neutral in these circumstances, the choice of the survey in preference to, for example, direct observation (Wilkinson, 1995) or the use of focus groups (Millward, 1995), reduced the likelihood of contamination resulting from the author's exposure to the organisation's culture.

However, it was recognised that although the questionnaire survey is designed to identify relationships between different variables, and this was especially important since the study seeks to identify the effects of team design variables on team climate and team performance, it is not able to investigate phenomena in any great depth. Although this was not a particular problem, it was felt that the results of the quantitative analysis would be strengthened if supported by qualitative data generated

through interviews. It was decided not to predetermine the population to be interviewed, except that they would form part of the population of survey respondents. The purpose of the interviews would be to provide an unstructured or semi-structured opportunity to explore and ultimately substantiate relationships of association and causation found in the data. This flexibility of approach was made possible because of the level of access granted to the writer.

4.4.2. Level of Analysis and Sampling Frame: 49 Project Teams

Whilst the research hypotheses presented at the close of chapter two will be tested in a single organisation, the organisation itself is not the unit of analysis. Identifying the unit and level of analysis that is appropriate to the research questions and propositions has emerged in recent years as an issue of concern to organisational theorists and researchers (e.g. Goodman, 1987; Campion, 1988; Rousseau, 1988; Glick, 1988). Because organisations are multi-level, composed of individuals working in dyads and groups within organisations that interact with other inter-and intra-sectoral organisations, a research design can never be level-free. The unit of analysis refers to the subject of study which, in this case, is the form of work organisation which pervades construction project-oriented organisations, that is, the project team. The level of measurement describes the actual source of the data: "the unit to which data are directly attached (e.g. self-report data are generally individual level, the number of group members is measured at the group level)" (Rousseau, 1988: 4). The level of statistical analysis describes the treatment of the data used during statistical procedures. For example, if the level of measurement is the individual, but individual scores are aggregated to create a group mean, the level of statistical analysis is the group. When levels of theory, measurement and statistical analysis are not in equilibrium, "the obtained results may reflect the level of measurement or statistical analysis rather than the level of theory" (Klein, Dansereau

and Hall, 1994: 199). Levels of measurement and of statistical analysis will be discussed in more detail below. Here the unit of theoretical analysis is the project team and, in particular, the decision to study a population of 49 project teams within a single case study organisation.

The characteristics and performances of the project team are the units of empirical analysis and data was collected from a sampling frame of the 403 members of 49 project teams within Conorg, and from a sample of the 49 projects' clients. A list of all members of the team member population was obtained from Conorg's Human Resources department. The list contained the following information on 761 individuals: surname and initials, company start date, age, division/department, project location, qualifications and professional memberships. All individuals working in project teams with at least three members were identified from the list. The final sample consisted of 49 teams with 403 members. The questionnaire was distributed to all 403 individuals in September 1994.

Information on the project teams' clients was obtained direct from the project team members. At the end of the team member questionnaire the respondent was asked to identify the name of the project team's client or customer and the principal contact. On some of the larger projects, several clients were identified. A customer satisfaction questionnaire was then sent to this person or persons (appendix E). Together with its 31 item, 5-point Likert scale assessment of the team's performance, the questionnaire also asked the customer to supply his name and contact address, to outline his relationship with the team, and to specify the team's purpose or goal. Data was obtained from 38 clients covering 31 of the 49 projects.

So that the results of the study may be generalised to other project teams outside Conorg, it is important that the core characteristics of the project teams in this single

case experiment are identified and categorised. Firstly, although this is a single case study experiment, data will be collected from a relatively large number of project teams (n=49). These teams share characteristics with each other and with other teams engaged in similar tasks in the construction project management sector and, possibly, elsewhere. But this sample also has the advantage of controlling for the effects of culture and therefore constitutes a relatively homogenous group of cases. And secondly, the teams are all temporary, natural groups, with responsibility for the implementation of a specific project task. They are different from standing teams (e.g. work teams involved in car assembly) because they have a finite life-span.

But in order to ensure consistency in our sample, it is important to consider the possible confounding effects of two factors that are influential in project management: time and task.

4.4.2.1. Controlling for the Effects of Differences in Project Time-Scales

In chapter three it was noted that time is of special importance to project teams. Research suggests that the performance of project teams reaches a peak after approximately 2-3 years (Katz and Allen, 1982). This increase in performance levels is often associated in the literature with the systematic development of group norms, through for example, Tuckman's (1965) forming, storming, norming and performing stages or McGrath's (1984) generating, choosing, resolving and executing stages. It was argued that this linear-rational approach to the creation of structural-functional states within groups is reductionist and obscures the role that climate can play in establishing and stabilising team performances at high levels. Following Bettenhausen and Murnighan (1985) and Gersick (1990), it was proposed that powerful norms emerge (and can be managed) at the start of the project. This suggests that it is possible to use a fixed point, cross-sectional questionnaire design to

measure shared perceptions of team climate and leadership practices (for example) despite the fact that this measure may be taken at very different points in the 49 projects' respective life-cycles. This is also theoretically consistent with the research hypothesis that the design interventions in work organisation that might enhance the capacity for high performance should take place either at the start of project (e.g. establishing norms) or throughout the project (e.g. leadership practices).

4.4.2.2. Controlling for the Effects of Differences in Task

Project management is a discipline designed to manage complexity and turbulence in the implementation of a particular product or service. By their nature, all project management tasks are different because all are unique. If it was possible to control for differences in task then there would be no need for project management. Outside of the laboratory or, possibly, a highly controlled manufacturing process environment, it is impractical to create the conditions in which a large sample of naturally occurring teams might work on a single task-type simultaneously. However, it is possible to determine whether or not the teams are operating in a broadly similar context of complexity and to assess if they are adopting similar task performance goals (in terms of their task management processes, not the content of the projects), a measure of project complexity was included in the customer satisfaction survey (see below) and to ask the customer to define the purpose or goal of the project.

Boddy and Buchanan (1992) identify eight dimensions upon which the complexity of a project can be measured, ranging from whether the project has marginal or core significance to a client's business, to the extent to which the project's intentions are controversial or uncontroversial. Means and standard deviations for 38 projects are presented in table 4.1. overleaf. With the exception of client position and sense of

participant ownership, all of the measures push towards high ambiguity and complexity.

	Mean	SD
1. <i>Significance to your business</i> (1=marginal; 5=core)	4.28	0.86
2. <i>Solution</i> (1=familiar; 5=novel)	3.46	0.91
3. <i>Pace</i> (1=gradual; 5=rapid)	3.79	0.80
4. <i>Intentions</i> (1=uncontroversial; 5=controversial)	3.05	0.80
5. <i>Changing goals</i> (1=rare/minor; 5=often/major)	3.24	1.13
6. <i>Client position</i> (1=supportive; 5=unsupportive)	2.21	1.06
7. <i>Outside links</i> (1=few; 5=many)	3.64	1.11
8. <i>Sense of ownership by all participants</i> (1=high; 5=low)	2.23	1.11

Table 4.1: Means and Standard Deviations for 8 Facets of Project Complexity in the Population of Project Teams (n =38)

A review of the team's purposes or goals, as defined by their clients, reveals considerable consistency. Typically, the team's purpose is to manage the construction of a project to the client's specification, on time, to the required level of quality and within the available budget. The construction can involve extension or modernisation, refurbishment, reinstatement, redevelopment or new-build. Variations on a common theme were confined to statements like: "to deliver a world class [project] which satisfies the client brief giving best value and in which all participants can take pride and gain satisfaction"; "to design, install and procure [the project] whilst maintaining the integrity of the existing operation" and "to support the client in its business goals by successfully completing the project". Types of project ranged from theatres to supermarkets, social housing to car parks, office blocks to sports arenas, science parks to railways, and national trust buildings to airports. The

size, scope and nature of the projects are fairly representative of work underway in the construction sector during the mid-1990s.

In conclusion it is argued that a single-case, cross-sectional experimental design has both strengths and limitations. Its strengths arise from an ability to control for the effects of, for example, organisational culture and particularly the experiences of team members in relation to corporate values, communications, socialisation, work environment and so on. Its limitations are related to the difficulty of sampling teams at a similar stage in their development and the difficulty in generalising results from the case study organisation to other project teams outside Conorg. However, there are three factors which, on balance, support the choice of research design:

1. Because project management is, by its nature, an unrepresentative activity, it is justifiable to sample a number of projects from within a single organisation on the assumption that no sample is likely to be genuinely representative.
2. The research design reflects the methodological, conceptual and substantive issues identified by group researchers (e.g. McGrath, 1987) and the need for multi-variate studies of naturally occurring groups that are more similar than dissimilar.
3. Because individuals transfer past scripts into new work environments (Bettenhausen and Murnighan, 1985), the value of studying groups at different stages of development is questionable. Instead, it is argued that more value is to be gained from studying groups whose members' scripts have been learned from extended exposure to an organisational culture which transcends specific group experiences.

4.5. Operational Definitions, Measurement Scales, and their Reliability and Validity

In empirical research it is necessary to look for measures of the constructs that we are interested in. We need to find observable phenomena from which the construct can

be inferred. According to Hofstede (1980), “any operationalisation of mental programs has to use forms of behaviour or outcomes of behaviour” (1980: 17). The measurement of the constructs in this study are complicated because they focus on individual team members perceptions of group level phenomena (Anderson and West, 1994).

This section will provide operational definitions for each of the variables contained in the research hypotheses. Because the variables are, with some exceptions, attitudinal, the operational definition “is based on a subject’s response to one or more questions designed to tap the variable being studied” (Sirkin, 1995: 65). This increases the requirement to ensure that the operational constructs actually measure in practice what they are supposed to measure in theory (validity) and that they yield consistent results on different occasions assuming no real change in what is to be measured (reliability). Issues of validity and reliability will therefore be addressed later in the section.

4.5.1. Operational Definitions and Measurement Scales

The choice of scales was driven by the taxonomy of project team performance as is shown in figure 4.1. above (p. 114). Because the development of the model was heavily influenced by Kouzes and Posner’s (1987) description of transformational leader practices, by Hackman’s (1987; 1990; 1992) research into the design of groups, and by Anderson and West’s (1994) research into team climate, the decision to adopt scales that they had developed was a straightforward one. Similarly, the choice of the scales for job satisfaction and internal work motivation was based on their location within Hackman and Oldham’s (1980) job characteristics model, and is consistent with the work organisation design framework. The choice of scale for the team orientation measure was more problematic because it is a new concept,

grounded in an eclectic research base. Six items were therefore developed to measure the extent to which rewards and training was available to orientate the team towards high performance, and to determine if the team organisation structure created shared perceptions of equal status among team members. It was anticipated that the research study would provide a first opportunity to empirically examine the robustness of this measure.

The choice of scale to measure performance was also difficult, particularly as the model proposed customer satisfaction as the key indicator and no antecedents to this approach were found in the literature. Because of this, the author decided to contact all of the consultancy organisations cited by Geanuracos and Meiklejohn in their 1993 study of performance measurement (385-417). Charles Keeling, Price Waterhouse's head of Performance Measurement, was one of the few to respond and, following an exploratory meeting during which he shared PW's own questionnaire for measuring the performance of their project teams, it was decided to use this to measure customer satisfaction with the performance of the 49 project teams in this sample. In addition, it was decided to complement this measure with two more traditional indicators of performance, so fee income (average net income received for each project team member) and productivity (number of management hours expended for each £1000 of the project's total value) data were obtained from Conorg's project income analysis records.

Table 4.2. overleaf presents the operational definitions for each of the main variables contained in the research hypotheses and summarises the source of the scales used to measure the presence of the variables. Wherever possible, the operational definition is taken from the original source.

Construct	Variable Name	Operational Definition	Instrument	Measurement
Leader Practices	LEADER	Composite factor aggregated from five leader practices below		
Challenge the Process	CHALLENGE	To search out challenging opportunities to change grow, innovate and improve; and to experiment, take risks and learn from the accompanying mistakes		
Inspire a Shared Vision	INSPIRE	To envision an uplifting and ennobling future; and to enlist others in a common vision by appealing to their values, interests, hopes and dreams		
Enable Others to Act	ENABLE	To foster collaboration by promoting cooperative goals and building trust; and to strengthen people by sharing information and power and by increasing their discretion and visibility	Leadership Practices Inventory (Kouzes and Posner, 1993b)	Ordinal, 5-point Likert scale
Model the Way	MODEL	To set an example for others by behaving in ways that are consistent with your stated values, and to plan small wins that promote consistent progress and build commitment		
Encourage the Heart	ENCOUR	To recognise individual contributions to the success of every project; and to celebrate team accomplishments regularly		

Team Organisation	TEAMORG	Composite factor aggregated from five organisation design variables below		
Group Performance Norms	NORMS	Standards of conduct that regulate the work-related behaviour of individual members of the team, enabling appropriate, efficient and coordinated group action		
Task Structure	TASKSTR	The characteristics of the group task which determine its overall motivating potential. These characteristics are skill variety, task identity, task significance, autonomy and feedback from the job.		Based on Flight Crew Questionnaire / Symphony Orchestra Questionnaire (Hackman, 1988; 1991)
Group Composition	COMPOSTN	The balance and mix of team members in terms of their expertise and interpersonal skills		
Tenure	TENURE	The extent to which the amount of time team members have spent together has been sufficient to allow the team to perform well		Ordinal, 5-point Likert scale
Team size	TEAMSIZ	Number of individual members in the team	Gladstein, 1984	Ratio scale
Team Orientation	ORIENTN	Composite factor aggregated from three orientation variables below		
Group Rewards		Degree to which the reward system creates a strong incentive for high performance team working		
Group Training		Degree to which training is available to help the team achieve high performance		
Equal Status		Extent to which members of the team perceive themselves to be of equal status	Developed by the author, based on literature review	Ordinal, 5-point Likert scale

<p>Team Climate</p> <p>Vision</p> <p>Participative Safety</p> <p>Task Orientation</p> <p>Support for Innovation</p> <p>Social Desirability</p>	<p>CLIMATE</p> <p>VISION</p> <p>PARTICIP</p> <p>TASKORNT</p> <p>SUPPINNO</p> <p>SOCDESIR</p>	<p>Composite factor aggregated from four climate variables below</p> <p>Clear, negotiated, attainable and ideally, evolving out of some valued future outcomes</p> <p>Influence over decision-making, information sharing, interaction frequency and safety</p> <p>Reflexivity, constructive controversy, tolerance of minorities and commitment to excellence</p> <p>Articulated support and enacted support for innovation by team members</p> <p>Occurs where team members give falsely positive ratings of team climate - too positive to be likely in reality</p>	<p>Team Climate Inventory (Anderson and West, 1994)</p>	<p>Ordinal, 5-point Likert scale</p>
<p>Affective States</p> <p>Member Job satisfaction</p> <p>Member Internal Work Motivation</p>	<p>JOBSAT</p> <p>MOTIVATN</p>	<p>Degree to which team members find their work generally satisfying</p> <p>Degree to which team members find their work intrinsically motivating</p>	<p>Job Diagnostic Survey (Hackman and Oldham, 1980)</p> <p>Job Diagnostic Survey (Hackman and Oldham, 1980)</p>	<p>Ordinal, 5-point Likert scale</p>

Project Characteristics Project Complexity	COMPLEX	Extent to which the project is more or less complex than other projects	Project Profile (Boddy and Buchanan, 1992)	Ordinal, 5-point scale	Likert
Project Value Project Duration	PROJVALU DURATION	The total cost of the project in sterling The total duration of the project in months		Ratio scale Ratio scale	
Project Performance Customer Satisfaction	CUSTSAT	Degree to which the team's principal customer(s) is (are) satisfied with the team's task performance	Customer Satisfaction Index (Price Waterhouse, 1994)	Ordinal, 5-point scale	Likert
Project Income	NETINCME	Average net income received for each project team member	Case firm's income analysis (October, 1994)	Ratio scale	
Group Productivity	PRODUCTY	Number of management hours expended for each £1,000 of the project's total value	Case firm's income analysis (October, 1994)	Ratio scale	
Member Characteristics Gender Education level Age Job Role	TMGENDER TMQUALS TMAGE TMROLE	Combined gender of team members Combined education of team members Combined ages of team members Combined roles of team members		Nominal scale Ratio scale Ratio scale Ratio scale	

Table 4.2: Operational Definitions for Each of the Variables used in the Survey Questionnaires

4.5.2. Validity and Reliability

The items included in the survey questionnaire were derived from four primary sources. Firstly, from tests with proven reliability and validity (i.e. the Leadership Practices Inventory, Job Diagnostic Survey and the Team Climate Inventory). Secondly, from tests with a sound theoretical underpinning, but limited psychometric test evaluation (i.e. Hackman's Flight Crew Questionnaire). Thirdly, from tests which were closely related to the operational definitions of the variables in the hypotheses but without any identified psychometric test evaluation (i.e. Buchanan and Boddy's Project Complexity Tool and the Price Waterhouse Customer Satisfaction Index). And finally, items which were developed by the author as a result of the literature review and direct observation of factors expected to affect the performance of construction project teams within Conorg (i.e. the Team Orientation items).

It is important to note that instruments were selected and items developed to test a normative theory. The theory therefore drove the adoption of the tests, not the reverse. This presents possible problems concerning the validity and reliability of some of the items used in the research. Because test validation is cumulative (Hammond, 1995a), and given the limited test histories of some of the items, we should be aware of the possible limitations of some elements of the research design. In particular the team orientation items requires further examination of their viability as a measurement device, together with their content, criterion and construct validity (Cronbach, 1971).

Because the research hypotheses seek to establish the predictive capability of the design variables on important project team outcomes such as customer satisfaction, the statistical procedures provide an opportunity for criterion validation of the items.

Moreover, the internal structure of the constructs will be examined using factor analysis techniques (construct validity). It might be argued that any issues surrounding the reliability and validity of the measures should have been resolved during the pre-testing phase (Sirkin, 1995: 69). However, this was only possible to a limited extent for two reasons. Firstly, because factor analysis is a variance partitioning method we need to obtain a sample size of 200 plus wherever possible (Hammond, 1995b). The sample size in the pilot study was much too small for robust construct validation (n = 57 team members; n = 10 project clients). Criterion validation was similarly affected. But secondly, emerging pressures within the research programme meant that it was necessary to press ahead with the main survey very soon after the pilot study had been completed. The deepening recession in the construction industry was rapidly reducing the number of suitable projects that could be included in the main sample. It was therefore decided to sacrifice more detailed work on the development of the questionnaire items in order to maximise the number of teams available for the sample.

The reliability and validity of all of the constructs will be reported in detail in section 5.2. of the next chapter.

4.6. Data Collection Procedure (Pilot Work, Main Survey and Interview Programme)

This section will describe the physical data gathering phases of the research programme and discuss the pilot work, the main survey and the interviews.

4.6.1. Pilot Work

Because the choice of data collection method was not influenced by the need to negotiate access within Conorg it was possible to carry out some pilot survey work in parallel with the literature review, and in advance of the full-scale survey. A pilot study was conducted in order to a) elicit information from respondents about, for example, ease of questionnaire completion and response rates and, more importantly, to b) explore the hypothesised relationships between several of the variables that were under active consideration for inclusion in the taxonomy of project team performance. The pilot focused on the hypothesised relationships between leadership practices, team climate, customer satisfaction and team member job satisfaction. It was intended that the pilot data would not be collapsed into the main study, but that the findings would be used to refine the model and ensure that any unforeseen problems with the research design were anticipated and effectively managed.

4.6.1.1. Pilot Study

The pilot had two objectives: firstly, to determine whether or not multicollinearity was likely to be a problem in the research design, and secondly, to conduct an initial investigation into some of the key relationships that were becoming important in the team performance model. Two questionnaires were constructed. The first questionnaire comprised 86 items designed for completion by project team members and the project team leader. The 86 items formed the fifteen constructs in table 4.3. overleaf:

<i>Leadership Style</i>	<i>Team Climate</i>	<i>Member Job Satisfaction</i>
Challenging the process Inspiring a shared vision Enabling others to act Modelling the way Encouraging the heart Coaching the team*	Participation Objectives Interaction frequency Task orientation Support for innovation	with job security with pay with co-workers with leadership

* From Fisher (1993)

Table 4.3: Constructs Measured in Pilot Survey

The second questionnaire comprised 23 items designed to measure client satisfaction with the team's performance, and eight items concerning the project's relative complexity.

A group of Conorg's part-time MSc Construction Management students were asked to distribute the first questionnaire to each member of their own project team and to give the second questionnaire to their project's client or sponsor. These teams had similar characteristics to those that would be included in the main sample. Respondents were guaranteed confidentiality and asked to return the questionnaires directly to the author's home address in a stamped addressed envelope within two weeks of receipt. The introductory letter was typed onto Open University-headed note-paper to increase the respondent's perception of the author's neutrality. The number of questionnaires returned from each team is reported in table 4.4 overleaf.

	Team Member (n)	Team Client (n)
Team one	6	1
Team two	3	1
Team three	5	1
Team four	3	1
Team five	3	No response
Team six	5	1
Team seven	2	1
Team eight	8	1
Team nine	4	1
Team ten	5	1
Team eleven	8	1
Team twelve	4	No response
Team thirteen	1	No response
Total	57	10

Table 4.4: Summary of Data Received from 13 Teams and their Clients in Pilot Study

This method of questionnaire distribution was both efficient and effective because it placed responsibility for the survey into the hands of a member of the team. However, it was unlikely to be feasible for the main survey because of the practical problem of identifying a contact on each project who would be willing to accept responsibility for distributing the questionnaires, as well as possible subject anxiety about the confidentiality of their responses and the neutrality of the researcher.

An exploratory analysis of the data was performed using SPSS to examine the twin issues of multicollinearity and the hypothesised relationships between leadership style and team climate, between team climate and job satisfaction, and between leadership style and team climate and team performance.

4.6.1.1.1. Multicollinearity

Regression analysis is based on the assumption that the independent variables in the regression are independent of each other. Multicollinearity arises whenever two or more independent variables used in a regression are not independent but are

correlated. It was expected that this may be a problem in this research design because many of the behavioural variables may be related, for example, within the leadership practices and team climate clusters. When two or more independent variables are correlated the statistical estimation techniques are incapable of sorting out the independent effects of each on the dependent variable.

Table 4.5. presents Pearson correlations for the principal variables and it is clear that there are strong inter-correlations between the team climate variables (support for innovation, interaction, vision, participative safety, task orientation) and the leadership practices variables (challenging, enabling, encouraging, inspiring and modelling, and coaching).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. SUPPORT FOR INNOVATION		.54	.53	.43	.38	.38	.35	.50	.45	.36	.57	.45	.54			.55
2. INTERACTION FREQUENCY	.54				.47	.37	.45		.48	.48	.81	.35	.51			.57
3. JOB SATISFACTION	.54			.45	.43	.49	.39	.49	.57	.42		.76	.76	.58	.52	.36
4. CHALLENGING (LEADER)	.43		.45		.57	.45	.45	.75	.62	.38		.41	.40	.41		.45
5. COACHING (LEADER)	.38	.47	.43	.57		.69	.70	.54	.75		.48	.60	.41			.36
6. ENABLING (LEADER)	.38	.37	.49	.45	.68		.66	.46	.71	.45	.46	.59	.45			.36
7. ENCOURAGING (LEADER)	.35	.45	.39	.45	.70	.66		.49	.68	.41	.50	.50				.36
8. INSPIRING (LEADER)	.50		.49	.75	.54	.46	.49		.62			.43	.36	.41		.38
9. MODELLING (LEADER)	.45	.48	.57	.62	.75	.71	.68	.62		.50	.47	.63	.52			.39
10. VISION	.36	.48	.42	.38		.45	.41		.50		.50	.40	.38			.43
11. PARTICIPATIVE SAFETY	.57	.81			.48	.46	.49		.47	.50			.44			.60
12. SATISFACTION - BOSS	.45	.35	.76	.41	.60	.59	.50	.43	.63	.40			.57			.45
13. SATISFACTION - CO-WORKERS	.54	.51	.76	.40	.41	.45		.36	.52	.38	.44	.57				.54
14. SATISFACTION - PAY			.58	.41					.52	.38	.44	.57				.54
15. SATISFACTION - SECURITY			.52													
16. TASK ORIENTATION	.54	.57	.36	.45	.36	.36	.36	.37	.38	.43	.60	.45	.54			

Table 4.5: Pearson Correlation Coefficients for Variables in Pilot Study (p < .01)

Because it was anticipated that these variables would form part of the cluster of independent variables in the subsequent and principal regression analysis to find the best predictive model of team performance, it was important that these variables were, as far as possible, independent of each other.

Because insufficient performance data was available from the pilot study it was not possible to use performance variables in the regression analysis and therefore to

assess the presence of collinearity across all of the independent variables. However, the team climate variables were also dependent in the team performance model, so eigenvalues and condition indexes were calculated for each of the team climate variables in turn to check the dependency of the leader practices variables and the other climate variables not included in the regression. The variances of each of the regression coefficients was compared with each of the other coefficients associated with the same eigenvalue. With the exception of the coaching leader practice and the modelling leader practice (.54 and .41 variance proportions respectively), and the interaction and participative safety variables (.64 and .66 variance proportions respectively) which were both highly dependent, the other variables had small variance proportions for the eleventh eigenvalue which suggests that the observed dependencies did not appear to be affecting their coefficients.

4.6.1.1.2. Regression Analysis

Stepwise regression analysis confirmed that there were predictive relationships between the leadership practices and dimensions of team climate and job satisfaction as hypothesised in the model of team performance. In particular, task orientation was predicted by the challenging leader practice, participation was predicted by the encouraging leader practice, shared vision was predicted by the modelling leader practice and support for innovation was predicted by the inspiring leader practice. In addition, job satisfaction was predicted by the modelling leader practice. Table 4.6. below shows the 'best' combination of independent variables for predicting the six dependent variables. The removal criteria was based on the default options in SPSS (minimum F value = 2.71; maximum probability of F-to-remove = 0.10).

Dependent (Adj. R-Square)	Vision (.24)			Support for Innovation (.22)			Participative Safety (.21)		
Independent	Beta	T	Sig. T	Beta	T	Sig. T	Beta	T	Sig. T
Enable Challenge Model Inspire Encourage	.51	4.27	.0001	.49	4.06	.0002	.48	3.96	.0002
Dependent (Adj. R-Square)	Task Orientation (.19)			Interaction (.35)			Job Satisfaction (.30)		
Independent	Beta	T	Sig. T	Beta	T	Sig. T	Beta	T	Sig. T
Enable Challenge Model Inspire Encourage	.45	3.69	.0005	.43	3.47	.0011	.56	4.97	.0000

(**Bold** denotes variable entered on step one of the regression)

Table 4.6: Stepwise Regression Analysis - Regressing Team Climate and Job Satisfaction onto Leadership Practices

4.6.1.2. General Conclusions Arising from the Pilot Work

The results of the pilot study led the author to several general conclusions which influenced the content and process of the main survey. These were as follows:

4.6.1.2.1. The combined length of the Team Climate and Leadership Practices Inventories dominated the questionnaire (70 items). Including more variables (i.e. task structure, job satisfaction and team orientation) would increase the size and complexity of the questionnaire and possibly affect respondents' ability to separate psychological constructs. The questionnaire would therefore need to be carefully designed in order to maintain its user-friendliness and to provide adequate psychological conditions in which construct separation could take place.

4.6.1.2.2. Despite the intercorrelations in the data between the leadership and team climate variables, eigenvalues and condition indexes indicated that collinearity was not present and the variables were generally independent of each other. However, there was some evidence that the coaching variable - because it sits outside Kouzes and Posner's leadership practices model - was not independent of several of the other leadership variables and it was therefore decided to remove this variable from the main survey.

4.6.1.2.3. The regression analysis confirmed the basic structure of the research model and the value of using a fine-grained, multi-variate approach (McGrath, 1986). However, it was decided that a programme of interviews following the main survey would help to establish the validity of the author's interpretations and simultaneously bring the relationships in the model to life using practical examples.

4.6.1.2.4. It was decided to retain a measure of job satisfaction in the main survey, but to use a measure of affective general satisfaction rather than context satisfaction. Because of the relationship between affective satisfaction and internal work motivation in the JDS, the six items used to measure the two factors were all included in the questionnaire.

4.6.1.2.5. Because of the small sample size it was not possible to perform a factor analysis on the customer satisfaction measure and to explore its underlying structure. But since customer satisfaction was central to the conceptual model it was decided to retain it in the main survey. However, it was also decided to identify other, more traditional measures of project team performance. These will be discussed in section 5.2. below.

4.6.2. Main Survey

The main questionnaire included 113 items which measured twenty variables. To recap, these are: challenging, inspiring, enabling, modelling and encouraging leader practices; team performance norms, task structure, group composition, tenure, team size; group rewards, group training, equal status; vision, participative safety, task orientation, support for innovation and social desirability; and team member satisfaction and internal work motivation. Although the questionnaire was designed to be anonymous, a further five items asked for information about the respondent's background: age, gender, qualifications, team tenure in months and job role. Three items asked the respondent to identify the name and address of her project and the name of the team's principal client or customer contact. A copy of the full team member questionnaire is located in Appendix A.

Because of the size of the questionnaire its physical presentation was important in order to foster respondent motivation (Fife-Schaw, 1995: 188). A brief explanation introduced the questionnaire which was entitled 'Team Performance Questionnaire' and emphasised the confidentiality with which the results would be treated. The items were grouped into eight sections and each section was titled. In order to de-emphasise the length of the questionnaire each section was separately numbered from 'one'. The questionnaire was produced in booklet form and stapled at the centre to give the appearance of a quality document. It was accompanied by a letter on Open-University-headed paper which was intended to give the respondents confidence that the researcher was neutral (although most would know that he was also employed by Conorg). The letter repeated the explanation in the questionnaire's introduction and asked the respondent to complete and return the questionnaire in the enclosed stamped-addressed envelope to my home address. In addition, the letter included a

request to those anonymous individuals who had participated in the pilot survey to kindly complete this second survey. A second letter of support from Conorg's Human Resources Director was also included in the pack. The letters are located in appendices B and C respectively.

Within ten days of dispatch, 142 (35 per cent) questionnaires were returned. A follow-up letter was sent out to the whole population on day twelve (appendix D). The letter appealed to the non-respondents to return their questionnaires and contained a summary of responses by each project team. This allowed team leaders and team members to compare their 'performance' with that of other teams. This strategy was successful and encouraged a degree of competition between the teams. Several team leaders contacted me, first apologising and then committing to urge their team members to respond. A second wave of questionnaires was returned and resulted in an overall response rate of 60 percent (243 questionnaires). This was considered to be satisfactory given the length of the questionnaire and the sensitivity of some of its items.

The second stage in the data collection was to obtain performance measures for each of the 49 teams. At the end of the team member questionnaire the respondent was asked to identify the name of the project team's client or customer and the principal contact. On some of the larger projects, several clients were identified. A customer satisfaction questionnaire was then sent to this person or persons (appendix E). This questionnaire was the same as the one used in the first pilot survey and was dispatched with a letter which was again written on Open University-headed note paper (appendix F). Together with its 31 item, 5-point Likert scale assessment of the team's performance, the questionnaire also asked the customer to supply his name and contact address, to outline his relationship with the team, and to specify the team's purpose or goal.

The response rate to the customer survey was initially very low: only 23 questionnaires covering 17 projects were returned. The poor response may have been a result of customer reluctance to give a negative assessment of their Conorg team's performance. Three customers stated that they did not want their results communicated to the teams. Two follow-up letters were sent out to the customers and this was supplemented by a telephone call. Within four weeks of the initial survey the response rate climbed to 39 returned questionnaires containing data about the performance of 31 teams. In seven cases, questionnaires were returned from more than one customer. Only one of the 39 questionnaires was unusable, giving an *n* of 38.

At the same time, data was obtained from Conorg's Management Information Systems department concerning the productivity and income of each of the teams. It was anticipated that this 'triangulated' approach would allow cross checks between the different types of data, so that a reliable and valid performance rating could be obtained for each of the teams.

4.6.3. Interview Programme

The interview programme had three objectives. Firstly, to confirm the impact of the variables identified in the research model on the performance of the team. Secondly, to identify any significant *other* influences on team performance. And thirdly, to breathe life into the research and to give it "depth, subtlety and personal feeling" (Pettigrew, 1990: 277) by providing real-life examples of the factors in the model. Although acutely sensitive to causal relationships between variables, quantitative analysis tends to be cold and can obscure the material experience and grounded realness of these relationships for stakeholders.

The immersion of the author in the research environment was influential in the decision to use the questionnaire survey as the principal method of data collection. But while quantitative techniques can reduce the possible effects of bias during the latter stages of the research programme, it cannot control the impact of contamination effects during the theory-building process. Early interest in the relationship between work organisation design and organisational performance may unintentionally have concealed the effects of significant *other* factors on the performance of project teams. Because of the complexity of the construction project environment it would be naive to assert that *all* confounding factors can be neutralised as a result of effective team design. This research has focused on the human solution to projects. It is unlikely that our understanding will be complete without consideration of technical factors also.

Interviews are prone to the same contamination and biases as other forms of research and this can be magnified where the researcher is employed in the same organisation as his subjects. Researcher motives may be questioned by the interviewee: what does the interviewer really want to hear from me and why? What effect will my responses have on perceptions of me in the organisation? Will he communicate my feelings to senior management? And so on. In order to counter this it was decided to make the circumstances surrounding the interview extremely positive for the subject.

Approximately one-third of the sample of 49 project team leaders were selected for interview. The five team leaders who had achieved the highest rating in terms of customer satisfaction, team productivity and project income were selected because it was anticipated that this would give a much broader and richer insight into the factors which affect the different performances of project teams. Interestingly, this produced a sample of fifteen *different* team leaders. No project achieved a top five ranking in

more than one performance category. This sub-sample was a theoretical sample (Fife-Schaw, 1995: 110) from which it was hoped to obtain insights into the factors which explained the high levels of performance of the fifteen teams.

Each of the team leaders was initially contacted in writing and it was explained that the quantitative research had been completed and that their project team had been identified as high performing using one of the three measures. It was explained that the researcher was interested in their views concerning the factors that accounted for their team's exceptional performance. They were asked to consider two questions:

- o What factors led to the high level of productivity/customer satisfaction/income on your project?
- o Did your project experience any turning points and/or critical incidents that explain its success?

Finally, they were requested to call the author to arrange a meeting at their convenience.

Thirteen of the fifteen team leaders were interviewed during February and March 1995. Because the influences on customer satisfaction were more subtle and complex than the influences on productivity and income, three additional team leaders whose projects were ranked six, seven and eight on the customer satisfaction scale were also interviewed. The interviews were relatively unstructured with few prompts and allowed the subject to free-think within the parameters of the two areas identified above. All of the interviews were open and data-rich. Only one subject seemed to direct his responses to what he thought was expected, emphasising to exhaustion how well his team had worked together 'as a team'.

4.7. Conclusion

This chapter has sought to provide a link between the theoretical and empirical components of the research study. It has proposed a methodology for examining the hypothesis that the application of a multi-dimensional model of work organisation design may positively affect the performance of project teams, and considered the benefits and possible shortcomings of the chosen single case experimental design. Moreover, the chapter has also located the study within the real-time experience of the case study environment in which the hypothesis evolved, and described some of the significant events that both influenced the evolution of the study and preceded the empirical work. Finally, it is concluded that the opportunity to collect data from a large number of project teams and their client sponsors, while controlling for the effects of organisational culture and other confounding influences, provides a rare opportunity to perform a fine-grained analysis of the relationships between a wide range of normative group-level constructs. This analysis is the focus of the next chapter.

5.0. RESULTS

5.1. Introduction

This chapter presents the results of the various statistical analyses performed on the data collected using the methods described in chapter four and considers some of the key issues arising from the results, prior to a fuller discussion in chapter six. The chapter has three principal sections. The first section (5.2.) considers the factor structure of the questionnaire items in order to establish their reliability and validity. Building upon the preliminary work in the pilot study, the section will also determine the presence of collinear data and its possible effects on the integrity of the subsequent regression models. The next section (5.3.) uses inferential statistics to explore each of the seven hypotheses drawn from the taxonomy of project team performance presented at the end of chapter three. From this, we will ascertain whether or not each of the variables in the hypotheses are independent of each other as a basis for “confirming the consequent” (Sirkin, 1995: 180); in other words, to determine if there is a relationship between the design and criterion (climate and performance) variables in the population of project teams. Some initial conclusions arising from the results are presented at the end of each piece of hypothesis testing as a preamble to more detailed consideration in the next chapter. A final section (5.4.) presents the results of the qualitative research using content analysis and discourse analysis techniques.

5.2. Factor Structure of the Team Performance Questionnaire

This section will extend the preliminary investigation into the reliability and validity of the questionnaire items reported in section 4.4.2 of chapter four. It will consider four questions:

1. To what extent is the original factor structure of the Leadership Practices Inventory (LPI) replicated in the sample of UK construction project team members (questionnaire items 1-30)?
2. Is the original factor structure of the Team Climate Inventory (TCI) replicated in the sample of UK construction project team members (questionnaire items 31-74)?
3. Is the factor structure of the Team Organisation variables consistent with the *a priori* variable groupings in the original taxonomy of project team performance presented in chapter two (task structure, team composition, team norms, tenure) (questionnaire items 75-100)?
4. How reliable and valid are the items used to measure Team Orientation (questionnaire items 101-106) and team member Internal Work Motivation and Job Satisfaction (questionnaire items 107-113)?

The first step in extracting meaningful results from the data set is to examine its factor structure to satisfy ourselves that the underlying dimensions of the variables are consistent with what we are trying to measure. This may not be problematic given that the Leadership Practices Inventory (LPI) and the Team Climate Inventory (TCI) have both been rigorously tested for reliability and validity (Anderson and West, 1992; 1994; Kouzes and Posner, 1987; 1993). Essentially, we want to demonstrate that the factor structure of the data set is not significantly different to that found by the test developers. There are obvious difficulties in replicating factors across different groups. An anticipated problem in comparing the teams used by Anderson and West in their validation of the TCI with those in this sample, for example, is the effect that tenure might have on the relative strength of the different factors. As we have seen, construction project teams are temporary organisations and have a fixed life-span compared with the more permanent teams found in other work

environments. Cross-cultural issues may also moderate the results, particularly given that the LPI was validated primarily on data collected in the United States. Despite these problems, Kline suggests that "something less than rigorous" should be used for statistical matching, (1994: 181) "namely that the subjective interpretation of the factors [should] be the same" (ibid).

In order to reproduce the test conditions in which the instruments were originally validated by their developers it was decided not to include all 121 items from the questionnaire in the factor analysis but to perform three separate analyses on the LPI, the TCI and the remaining items. It was recognised that this approach might not detect the existence of any higher level factor structure within the data. However, the conceptual model clearly differentiates between the behavioural (i.e. leadership), design (i.e. team structure), contextual (i.e. team orientation) and climate (i.e. team climate) variables and given the established reliability and validity of the items, it was decided to treat these dimensions as separate blocks. Reliability coefficients for each of the independent variables are presented in table 5.1. below:

Variable Cluster	Factor	r
Leader Practices	Encouraging	.89
	Enabling	.87
	Inspiring	.87
	Challenging	.82
	Modelling	.85
Team Climate	Participative Safety	.92
	Vision	.91
	Task Orientation	.86
	Support for Innovation	.89
	Social Desirability	.80
Team Organisation	Task Structure	.77
	Group Norms	.75
	Group Composition	.68
	Tenure	.48
Performance Orientation		.65
Affective States	General Satisfaction	.79
	Internal Work Motivation	.60

Table 5.1: Reliability Coefficients for 15 Independent Variables

The reliability coefficients show that the the internal consistency of the LPI and the TCI scales is quite reliable. The reliability coefficients of the team organisation and performance orientation scales are lower than those found in the other two scales but, with the possible exception of tenure, are acceptable.

Moreover, in order to check the presence of collinearity between the leadership, team organisation, team orientation and team climate variables, tolerance and variance inflation factors (VIF's) were computed and are presented below in table 5.2.

Variable Cluster	Factor	Tolerance	VIF
Leader Practices	Encouraging	.14	7.22
	Enabling	.17	5.93
	Inspiring	.13	7.55
	Challenging	.19	5.34
	Modelling	.17	5.78
Team Climate	Participative Safety	.16	6.30
	Vision	.33	2.99
	Task Orientation	.15	6.73
	Support for Innovation	.13	7.65
	Social Desirability	.15	6.54
Team Organisation	Task Structure	.58	1.71
	Group Norms	.21	4.87
	Group Composition	.16	6.21
	Tenure	.61	1.63
Performance Orientation		.37	2.68

Table 5.2: Tolerances and Variance Inflation Factors for 15 Independent Variables

Although the tolerances and VIF's are typically lower and higher than we would hope for, none of the tolerances fall below .13, giving us a reasonable level of confidence that separation will take place during the regression. Moreover, the presence of variables from the different clusters (climate, leadership, organisation) in the regression models for performance presented later in the chapter support the assumption that separation has, in fact, taken place.

5.2.1. Factor Structure of the Leadership Practices Inventory (LPI)

First, Bartlett's test of sphericity was used to test the hypothesis that the correlation matrix is an identity matrix. Because the value of the test statistic was large (4282.84) and the associated significance level small (.00000) it appears unlikely that the correlation matrix is an identity. Although the original LPI model does not seem to fit this sample of project managers particularly well, the high value of the Kaiser-Meyer-Olkin measure of sampling adequacy (.93) - considered 'marvellous' by Kaiser (1974) - indicates that it is wise to proceed with the factor analysis.

The factor analysis is technically exploratory in nature but also confirmatory since the objective is to explore whether or not the original factor structure can be reproduced with a different data set. In terms of the sample size, Stevens (1986) suggests that a minimum of five individual responses per variable but not less than 100 individuals for any analysis, is satisfactory. For this analysis the ratio is approximately eight individuals per variable. An initial factor analysis extracted four factors with eigenvalues greater than 1.0 (Kaiser, 1960). These four factors accounted for 60.1 per cent of the total variance. The remaining 26 factors together account for only 39.9 per cent of the variance. A scree analysis (Cattell, 1960) confirmed that only four factors should be retained in the analysis. Following a varimax rotation which converged in eight iterations it was possible to obtain a simple factor structure. The factor loadings are presented overleaf in table 5.3:

Item	Factor	Factor 1	Factor 2	Factor 3	Factor 4
25					.72
5					.83
15		.57			
20		.70			
10		.61			
30	Encouraging				.48
8		.83			
23		.73			
18		.75			
13		.70			
28		.55			
3	Enabling	.64			
7			.64		
2			.58		
17			.71		
22			.53	.53	
27			.71		
12	Inspiring		.50		
26			.68		
16			.66		
1			.69		
11				.60	
6				.44	
21	Challenging			.51	
29				.73	
9				.69	
14				.57	
24				.68	
19				.59	
4	Modelling			.60	

Table 5.3: Varimax Rotated Loadings For LPI Variables

In their factor analysis (n=36,226), Kouzes and Posner (1987) extracted five interpretable factors, although a few items on their factor loadings did share some common variance across more than one factor. The four-factor structure presented in table 5.3. is overlaid with the expected five factor solution. It is apparent that three factors are common to both models. These are as follows:

Five-Factor Solution	Four-Factor Solution
Enabling Others to Act	Factor One
Inspiring a Shared Vision	Factor Two
Modelling the Way	Factor Three

It was not possible to separately extract the two factors Encouraging the Heart or Challenging the Process from this data set. The former was subsumed into Enabling Others to Act, while the latter combined with Modelling the Way. However, three loadings on the fourth rotated factor were constructed from variables within Kouzes and Posner's Encouraging the Heart factor.

The first rotated factor has significant loadings on nine variables and all of these are significant. Moreover, none of the items loads significantly onto the other factors. The items lean heavily on the team leader *enabling others to act* (creates an atmosphere of mutual trust; involves others in planning; gets others to feel a sense of ownership). But the factor also incorporates some of Kouzes and Posner's Encouraging items (praises people for a job well done; makes sure that people are recognised for their performances).

The second rotated factor also loads significantly on nine variables. Only one of the variables loads significantly onto a second factor. The factor is dominated by the Inspiring items in the Leadership Practices Inventory (looks ahead and forecasts; describes the future; enlists others in a common vision). Three of the items are drawn from Kouzes and Posner's Challenging factor and these all relate to the team leader seeking to improve on the existing *modus operandi*.

The third factor again loads significantly onto nine variables and these centre on the team leader modelling the way for the team (is consistent in practising espoused values; is clear about his or her leadership philosophy). In addition, three items are drawn from the *Challenging* Factor (challenges the way we do things; stays up to date; asks what can we learn when things do not go as expected). These items can be interpreted as the team leader setting a practical example of the behaviours that he or she expects from other team members.

The fourth rotated factor loads on three items from the Encouraging the Heart factor. These relate to recognition of team members, although not confined to the individual's role or within the project boundaries. The items indicate that the team leader celebrates the whole team's accomplishments by telling the rest of the organisation about team successes.

It is important to understand why the factor structure obtained in this analysis is not identical to that of the questionnaire's developers. There are four likely explanations for the divergence:

1. The smaller sample size, by a factor of approximately 100, compared with the developers' sample. This means that the data are subject to much higher random variation; the standard error of a mean, for example, would be larger by a factor of ten.
2. The interpretation of the questions, and/or the environment in which the respondents operate, may be different from that of the developers' respondents.
3. The details of the factor analysis methodology used may lead to different results.
4. The developers may not have performed any sensitivity testing or validation of their factors. A typical test would be to randomly split their sample into two parts, separately analyse the two parts, and confirm that the factor structure was the same.

Of the four alternatives, the first two are most likely. In both factor extractions the rotation method employed was the varimax method, which attempts to minimise the number of variables that have high loadings on a given factor. The extraction methodology was therefore identical in both cases and this leads us to discount the applicability of the third explanation. And, with respect to the fourth alternative,

Kouzes and Posner report that the stability of the factor structure was tested by factor analysing data from different sub-samples. This confirmed the original factor structure of the LPI (Kouzes and Posner, 1993:194).

There are possibilities in the second explanation. It has already been suggested that the team members in the sample operate in a unique environment. However, there is no reason to assume that the original factor structure is not appropriate to the leadership of construction project teams, albeit leadership practices in a temporary organisational setting. Factor analysis always optimises the choice of factors for the data set currently being analysed. Subsequent analysis of a similar data set does not guarantee that the same factors will be extracted. This would not be a problem if it was possible to compute standard error and thereby assess the repeatability of the results in different samples. Because of this, it is sensible to retain the original five-factor solution because it is based on a very large sample, and would be expected to possess a stable structure. The factor coefficients in this sample are generally not very large and it would be dangerous to draw conclusions from figures lower than 0.70 or 0.75. In this context, the only strange results are those for factor one, where items 5 and 25 are in one factor and item 20 in another. Interestingly, a closer look at items 25, 5 and 30 and 10, 15 and 20 suggests some possible explanation for the different interpretation of the questions by team members. Thus item 5 ("takes the time to celebrate accomplishments when project milestones are reached"), item 20 ("finds ways to celebrate accomplishments") and item 30 ("makes it a point to tell the organisation about the good work done by his or her team") might be interpreted by respondents as celebration and recognition of the team's achievements once the project is completed, while items 10, 15 and 20 refer to recognition for individual contributions. This, though, does not justify the extraction of what is effectively a sixth factor. The original five-factor solution will therefore be retained for hypothesis testing.

The predictive validity of the five-factor LPI was originally established by developing a leadership effectiveness scale. The scale contained six Likert-type items on five-point scales which asked about, for example, the extent to which the manager meets the job-related needs of his or her direct reports, has built a committed team, and is able to influence senior management. Regression analysis was performed with leadership effectiveness as the dependent variable and the five LPI factors as the independent variables. Kouzes and Posner report that the regression equation was highly significant ($F = 318.88$), $p < .0001$), with the five factors explaining over 55 per cent (adjusted $R^2 = .756$) of the variance around direct reports evaluations of their leaders' effectiveness (1987: 320). Moreover, other independent research has established a link between the LPI factors and organisational effectiveness, work group vitality, and job satisfaction and organisational commitment (Stoner-Zemel, 1988; Lipton, 1990; Plowman, 1991; Smith, 1991; Posner and Brodsky, 1992, all reported in Kouzes and Posner, 1993). We will of course determine whether or not these five leadership practices are also predictive of team climate and various indicators of project team performance later in the chapter.

5.2.2. Factor Structure of the Team Climate Inventory (TCI)

A similar procedure to the one outlined above was used to examine the factor structure of the Team Climate Inventory (TCI). It should be noted that the format of the TCI has been modified and is different from that used to validate the original structure of the TCI. The earlier version contained 116-items grouped into nine scales. This version of the TCI was piloted in studies of oil company, nursing and hospital management teams. The results indicated that although the 116-item version was a reliable and valid measure of team climate, further refinement was necessary. A subsequent major study of 27 NHS management teams was undertaken ($n = 27$ teams) which “provided the database upon which most of the initial reliability and factor analytic procedures were run” (Anderson and West, 1994: 11). From this

study the 44-item version of the TCI was developed. Four further follow-up validation studies were commissioned between April 1991 and April 1992 during which the factor structure and construct validity, discriminable and consensual validity and predictive validity of the Inventory were checked (reported in Anderson and West, 1994: 37-48).

The suitability of the data for factor analysis was assessed using Bartlett's test of sphericity. As with the LPI, the test statistic was large (5947.87) and the associated significance level small (.00000), which indicates that it is unlikely that the correlation matrix is an identity. However, the 'marvellous' value of the Kaiser-Meyer-Olkin statistic (.94) again indicates the suitability of this data for factor analytic procedures.

An initial principal components analysis was computed which extracted eight factors with eigenvalues greater than 1.0 (Kaiser, 1960). Application of a scree analysis (Cattell, 1966) confirmed that only six factors should be retained in the solution. These six factors collectively accounted for 59.1 per cent of the total variance. A simple structure was produced using a varimax rotation which converged in fifteen iterations. Factor loadings are shown overleaf in table 5.4.

In the original model four factors were identified but the factor analysis extracted five factors (Anderson and West, 1992: 9-12, 17). These were in order of extraction: (1) Vision, (2) Participative Safety, (3) Support for Innovation, (4) Task Orientation and (5) Interaction Frequency. Repeated analysis with different samples failed to differentiate between Participation and Interaction Frequency (Anderson and West, 1994). A study of a Swedish sample of work groups which used the TCI also failed to separately uncover the fifth factor (Agrell and Gustafson, 1994). In this study the first factor extracted comprised all twelve items from the Participative Safety subscale, with only one item loading onto a second factor. Interaction Frequency could

Factor Items	Factor One	Factor Two	Factor Three	Factor Four	Factor Five	Factor Six
31	.63					
46	.70					
53	.64					
37	.59					
43	.53					
33	.25					.66
38	.60					
49	.51					
35	.74					
44	.62					
50	.64					
56 PS	.57					
32				.40		.51
40	.52			.30		
51				.70		
54	.27			.70		
36				.48		
41	.42			.40		
47	.48			.54		
55 Vision				.51		
57		.62				
61		.46				
58		.80				
63		.71				
64		.78				
65		.46				
59		.79				
60		.55				
67		.39				
62		.27				.64
66 TO		.17				.66
73			.64			
74			.56			
69			.60			
70			.73			
71			.80			
68			.35			
72 SI			.61			
39					.63	
42					.54	
48					.69	
34					.44	
45					.55	
52 SD					.37	.52

Table 5.4: Varimax Rotated Loadings For TCI Variables

not be extracted separately. The factors were retrieved in the following order: (1) Participative Safety, (2) Vision, (3) Task Orientation, (4) Support for Innovation and (5) Social Desirability.

Factors two (Vision) and three (Task Orientation) display relatively unambiguous patterns of item loadings with only two items from factor three loading onto a second factor. The fourth factor (Support for Innovation) comprised four items that also loaded onto factor

one, but these factor coefficients were not particularly large (all $<.52$). The new Social Desirability factor (five) was also retrieved as expected with only one item loading onto a separate factor. The sixth factor consists of five items which are factorially complex. These items are "We all influence each other" (from the Participative Safety sub-scale),

"Assistance in developing new ideas is readily available" (from the Support for Innovation sub-scale), "To what extent do you think your team's objectives can actually be achieved?" and "To what extent do you think these objectives are realistic and can be attained" (from the Vision sub-scale) and "The team consistently achieves the highest targets with ease" (from the Social Desirability sub-scale). Because none of the factor coefficients exceed 0.66 it is unwise to draw any inferences about the possible interpretation of this factor.

In summary, the underlying factor structure displays a pattern of item loadings which is consistent with both Anderson and West's original four-factor solution and with the five factor solution which includes the social desirability scale. The internal homogeneity of the five factors is also acceptable. As we have seen above, reliability coefficients were acceptably high at $r = .92$, $r = .91$, $r = .86$, $r = .89$ and $r = .80$ for the Participative Safety, Vision, Task Orientation, Support for Innovation and Social Desirability scales respectively.

The test developers established the predictive validity of the TCI by collecting reports of innovations implemented by the management teams in the NHS study. A

combined list of 205 identified innovations was then passed to a panel of judges who rated the innovations on a '1-5' scale on the following six dimensions: magnitude, radicalness, novelty, benefit to administrative efficiency, benefit to patient care and benefit to staff well-being (Anderson & West, 1992b: 18-19). Regression analyses indicated that team climate "predicts a significant proportion of the variance in overall innovation ($R^2 = .53$), innovation magnitude ($R^2 = .40$) and team self reports of innovation ($R^2 = .82$)" and that "Support for innovation emerges as the main predictor of overall innovation, accounting for a substantial 46% of the variance ($R^2 = .46$; $F = 21.71$; $df = 1,25$; $p = <0.001$)" (Anderson and West, 1992b: 25). Participative Safety emerged as the best predictor of the quality of innovations, with task orientation predictive of both innovation radicalness and administrative effectiveness, and support for innovation predictive of quality of innovation (novelty). Agrell and Gustafson's (1994) study confirms the predictive validity of the TCI (1994: 146). They developed a tripartite Team Production Questionnaire scale measuring team creativity, quality and quantity. Pearson correlations produced moderate-to-strong correlations between each of the team climate dimensions and team creativity (ibid). The predictive validity of the TCI will be further explored in this study in relation to customer satisfaction, productivity and income measures, and also with internal work motivation and job satisfaction.

5.2.3. Factor Structure of the Team Organisation, Team Orientation, Job Satisfaction and Internal Work Motivation Variables

The items which measure the team organisation dimensions of the taxonomy are derived from a questionnaire designed by Hackman (1988) as part of a NASA-supported study of the functioning of flight crews. The aim of Hackman's project was to determine which factors are most important in affecting how flight crews perform. Although no detailed statistical analysis of the research project exists, supplementary research by Hackman and colleagues into the factors affecting the

performance of symphony orchestras did use multivariate analytical techniques. The questionnaires in the orchestra study were subsequently examined for their psychometric properties. Hackman's model of group performance incorporates four dimensions: organisational features; behaviour of the team leader (music director, pilot); group processes and outcomes, and respondent motivation and satisfaction. The questionnaire comprised 87 items distributed across six sections. The items were generated to assess the validity of the model's four dimensions. Questionnaires were distributed to members of symphony orchestras in the United States, the United Kingdom, East Germany and West Germany. Following inter-item correlations, factor analysis and inspection of means and standard deviations ($n = 924$), 24 measures were constructed (seventeen composite measures and seven single items of specific interest). In this study items from the Organisational Features and Respondent Motivation and Satisfaction domains were utilised. These were as follows:

Organisational Features: *Integrity as a Group (7 items)*

Group Structure: Task and Composition (8 items)

Respondent Motivation and Satisfaction:

Internal Work Motivation (4 items)

General Satisfaction with the Job (3 items)

A further six items were developed and included which addressed team orientation (rewards, training and the perceived equality of team members in terms of positional status within the organisation). All of these items were selected because of their sensitivity to the operational definitions in the research model. It is emphasised that although team orientation is hypothesised to be an important predictor of project team performance, the variable requires further psychometric development before it can be considered to be as robust as, for example, the leader practices, team organisation and

team climate measures. It is therefore recommended that team orientation should be the subject of further research beyond the scope of this study.

It should also be noted that some of the language used in the Team Organisation items was modified to reflect the working environment of the population in the sample (e.g. "Changes in the make-up of teams occur so often that *project managers* do not have the opportunity to get really comfortable with the team they are working with on a particular *project*"). It was appreciated that this could affect response patterns and factor loadings but was nevertheless unavoidable. However, the factor analysis remained essentially confirmatory since the questions were grounded in Hackman's *a priori* framework.

Factor Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
91	.77						
82	.70						
84	.67						
96	.50						
94					.57		
99					.59		
100					.64		
80					.63		
78		.73					
83		.53					
85		.75					
87		.69					
75				.57			
98				.83			
120				.91			
108			.74				
110			.76				
112			.63				
107						.73	
109						.60	
111						.58	
113						.56	
103							.76
106							.64
92							.63
102							.49

Table 5.5: Varimax Rotated Loadings For Team Organisation, Team Orientation, Job Satisfaction and Internal Work Motivation Variables.

The final principal components analysis in the sequence of three extracted fourteen factors with eigenvalues greater than one. The subsequent scree indicated that only seven of these factors should be retained. Of the 47 items in the original scale 26 items loaded onto discrete factors. In two cases this confirmed Hackman's *a priori* model: factor three (general satisfaction) and factor six (internal work motivation). These two factors are both fairly robust and have been an integral part of the Job Diagnostic Survey since the 1970s (Hackman and Oldham, 1980). They will be used here in their original form which is to measure the affective outcomes of the three levels of project team work design, as well as team climate.

The meaning of the other five factors has to be deduced from the factor loadings. The first rotated factor loads onto five items. These items are consistent with the task elements in Hackman's task and composition factor. The items relate to the characteristics of intrinsically motivating jobs (Turner and Lawrence, 1965; Hackman and Lawler, 1971; Hackman and Oldham, 1975). The original job characteristics model focused on work by individuals involved in independent tasks. As we saw in chapter three, however, Hackman's application of job characteristics theory in his study of flight crews and symphony orchestras moves the repository of these characteristics from the individual to the team. Thus items are phrased in terms of "the work we do...", or "certain individuals in our team...", or "the way our task is set up...", as opposed to "the job is..." or "to what extent does your job..?". The factor extracted items relating to four of the five original constructs of the job characteristics model: task and skill variety (for example, "the work we do is challenging requiring use of a number of high level skills"), task identity ("our task is engaging and involving"), task significance ("the work our team does is meaningful and important") and autonomy ("there is a great deal of room for initiative and judgement in the work we do"). Several items included in the questionnaire which were expected to load onto the fifth job characteristic, feedback, did not do so. This may be a consequence of the environment that the project teams operate in. Team

members may not receive clear, timely and relevant feedback about the effectiveness of their task performance. This characteristic aside, the factor is dominated by the constructs taken from the job characteristics model and can be interpreted as *task structure*.

The second factor loads significantly onto four items and these are consistent with four of the seven items in the group performance norms factor (for example, "our team has clear standards, or rules of conduct for the behaviour of its members" and "individual roles in our team are clearly understood by everyone - members know what they are expected to do and they do it"). Research into task forces by Gersick (1990) suggests that a newly formed group will create an implicit framework of 'givens' about both its situation and what is acceptable and unacceptable member behaviour. This framework constitutes a stable platform from which the group will make decisions and choices during the first phase of its life, or until an event that punctuates its equilibrium and the framework is redefined (Eldrege and Gould, 1972). Gersick concludes from her study that "[t]he quality of groups' endings appears to depend significantly on the stances that groups take at... first and midpoint meetings. The implication is that the initial design and the midpoint are especially good times to influence the outcomes of special project groups" (1990: 111). This factor can therefore be interpreted as *group norms*.

The fourth rotated factor loaded on three variables. Two of the questionnaire items were based on questions from Hackman's flight crew questionnaire ("our team has worked together long enough for us to develop into a real team" and "changes in the make-up of teams occur so often in this organisation that [project managers] do not have the opportunity to get really comfortable with the team they are working with on a particular project"). The third item is a biographical item ("How long have you been a member of this team?") and responses were grouped into five month periods on a ratio scale (0-5 months; 6-10 months, etc.). These items are clearly not

tautologous and the extraction of this factor was expected given the importance of time to the project team. This factor is therefore interpreted as *tenure*.

The fifth factor loaded onto four items from Hackman's task and composition factor. These items relate to the size of the team ("The size of our team is just right"), whether or not team members possess the right quantity and quality of skills needed to successfully complete its task ("Our team has people with the right mix of complementary skills to do its work well"), and the ability of team members to work well within a team. Typically, the membership of construction project teams is based on the need for functional representation across the major technical disciplines (project or contracts manager, commercial manager, engineer, construction manager). Selection criteria emphasises the technical expertise of individuals, rather than heterogeneity of member team roles or styles. However, interpersonal skills and the ability of team members to gel quickly as a team are as important as ensuring that the team has sufficient technical expertise or the right mix of shapers, completer-finishers and plants (Belbin, 1981). Katzenbach and Smith (1993) support this approach, suggesting that technical or functional skills can be overemphasised in team selection (1993: 48). Once focused on a common purpose, teams can quickly overcome deficiencies in skills or knowledge through problem solving and learning. This factor is unambiguous in terms of its loading and can therefore be labelled *group composition*.

The final, seventh, factor loads onto four items. Three of these items are drawn from the *a priori* construct described as team orientation; the fourth item is one of the three feedback items contained in the questionnaire ("Lots of people let us know what they think of our performance a team"). Team orientation relates to certain contextual factors that can reinforce and support performance-oriented team working. Hackman and Walton (1986) identify three specific features of the organisational context that are significant in creating team effectiveness: the reward system, the educational

system and the information system. Typically, these factors are policy matters determined by the parent organisation. Two of the three dimensions are explicitly present in the factor loadings: rewards ("The reward system creates a strong incentive for effective team working") and education ("Training is available to help us work well as a team" and "We have been trained to use our strengths to the benefit of the team"). Items relating to the effectiveness of the information system were not included in the questionnaire in the sense that data will be provided to help the team formulate task-related strategies. Feedback on performance is an information issue, however, because it can assist the team in either consolidating or realigning its task performance strategies. Two additional items were expected to load onto this variable but did not. These relate to the relative status of members of the team. Although the factor loadings are not entirely as expected, the factor will be retained for further analysis and is labelled *team performance orientation*.

There is no existing data available on the predictive validity of the original team design variables. However, this will be established when the hypotheses that team climate and team performance are dependent upon team organisation are tested.

5.2.4. Single Items Retained

Several single items will also be retained for analysis. These are gender, education level, age and job role (from the biographical information section in the questionnaire).

5.3. Multivariate Data Analysis

5.3.1. Normality

Visual examination of the variables with normal distributions superimposed on histograms did not suggest a significant departure from normality. However, computation of formal indexes for skewness and kurtosis indicated that values did not cluster around 0 (even though it is virtually impossible to find any data that are exactly normally distributed (SPSS: 115)). For most of the variables the data was negatively skewed towards the low values and the high negative values for kurtosis indicated that the distribution was less peaked than normal. A test of the null hypothesis that the data come from a normal distribution using the Lilliefors test was rejected with significance levels ranging from $p < .0000$ to $p < .2000$.

5.3.2. Social Desirability Response Scale (TCI)

The Team Climate Inventory includes a social desirability scale which measures the extent to which team members give falsely positive ratings of team climate (Anderson and West, 1994). The test developers suggest that scale totals of between 10-19 indicates the presence of some social desirability effect, while a scale total above 20 reveals “[u]nacceptably high social desirability response [and a] [d]efinite possibility of response bias” (Anderson and West, 1994: 27). A score below 10 is deemed to show an acceptably low level of social desirability.

Interestingly, all 49 teams in the sample scored above 10 on the social desirability scale, and eight exceeded a score of 20. None of the teams achieved Anderson and West’s acceptably low level of social desirability and this indicates either that all of the teams have “unjustifiably positive impressions of group climate or the perceived

self-value of the group compared to other similar groups” (Anderson and West, 1994: 27), or that Anderson and West’s interpretation of the scale totals for social desirability is flawed. It is possible that the high scores reflect underlying cultural traits within Conorg. Anderson and West (1994) state that high social desirability scale scores indicate that team members “claim never to feel tense with each other [and that the team] always functions well and achieves all targets with ease. Team members believe the team to be the best in its field” (1994: 20). Conorg people have been criticised as ‘arrogant’ in client perception surveys and this may be evident in the high social desirability scores. Because of the consistently high scale scores across all teams in the sample and the likelihood that this generic effect is culturally-derived, this is probably not evidence of respondent bias.

5.3.3. Comparison of Sample Data with Data from the Normative Population

Results of a comparison of the data from the sample with available data from the normative population are presented overleaf in table 5.6. Normative data is available for the Leadership Practices Inventory, the Team Climate Inventory and the Job Diagnostic Survey. It is unwise to read too much into the absolute scores of the sample population relative to the scores of the normative population. However, we might make two general conclusions. Firstly, that the leadership style of construction project managers in the sample is less ‘transformational’ than is generally found in the normative population. This is consistent with the production-driven, adversarial and temporal nature of the construction project management environment and its proclivity to generate a hands-on, aggressive and heroic project team leadership style. The Inspiring practice is a particular area of leader weakness in the sample population.

Scale/Sub-Scale	Sample			Normative Population		
	Valid n	Mean	SD	Valid n	Mean	SD
LEADERSHIP STYLE	49	98.63	16.97	36,226	N/A	N/A
Challenging	49	3.16	0.67	36,226	3.73	0.69
Inspiring	49	2.73	0.71	36,226	3.41	0.81
Enabling	49	3.73	0.62	36,226	3.98	0.72
Modelling	49	3.60	0.67	36,226	3.69	0.69
Encouraging	49	3.26	0.80	36,226	3.66	0.86
TEAM CLIMATE	49	3.53	0.42	148	N/A	N/A
Participative Safety	49	3.69	0.56	148	3.77	0.80
Support for Innovation	49	3.31	0.46	148	4.07	0.80
Vision	49	3.89	0.44	148	3.76	0.75
Task Orientation	49	3.41	0.58	148	3.43	0.85
Social Desirability	49	2.95	0.53	N/A	N/A	N/A
JOB SATISFACTION	49	3.50	0.65	N/A	3.50	0.71
INTERNAL WORK MOTIVATION	49	4.24	0.44	N/A	4.14	0.46

Table 5.6: Comparison of Means and Standard Deviations For Variables with Population Norms.

Secondly, although the scores for participative safety, vision and task orientation are relatively normal, the score for support for innovation sub-scale is low ("This team is always moving towards the development of new answers"; "This team is open and responsive to change"; Team members provide practical support for new ideas and their application"). The paucity of articulated or enacted support for innovation may again be a consequence of the temporality of the construction project management environment. Once the direction is set, construction teams drive the project forward with little time devoted to review and improvement of systems and approaches. As will be discussed later, this may be an appropriate task performance strategy in some circumstances, but not when the project is highly complex and requires extensive learning, problem solving and innovation. A second reason may be cultural in origin. An investigation into the attitudes of a cross-section of the case-firm's managers concluded that "ideas die in [Conorg]".

5.3.4. Descriptive Statistics

Section 5.3.3. above reported means and standard deviations for the variables for which normative data is available. Table 5.7. overleaf presents summary descriptive statistics for all variables examined in this study (Mean, Standard Deviation, Kurtosis, Skewness Range, Maximum, Minimum, Variance, Standard Error).

5.3.5. Hypothesis Testing

The aim of this section is to measure the strength of association between the variables in the taxonomy and to determine the predictive power of the model of team performance. Because of the structure of the model, the hypotheses will be examined in seven sections:

5.3.5.1. Enabling Factors (three levels of design) and Team Climate (H4)

5.3.5.2. Enabling Factors (three levels of design), Team Climate and Internal Work Motivation and Job Satisfaction (H6; H3.1)

5.3.5.3. Enabling Factors (three levels of design), Team Climate, Internal Work Motivation and Job Satisfaction and Project Performance (H1; H5; H3.2)

5.3.5.4. Team Climate and Project Complexity (H2)

5.3.5.5. Self and Subordinate Ratings of Enabling Conditions (three levels of design), Team Climate and Internal Work Motivation and Job Satisfaction (H7)

For purposes of completion, a final section (5.3.5.6.) will briefly consider the effects of the Biographical and Project Variables (Single Items).

Correlation-regression analysis will be used to analyse the hypothesised relationships at three levels:

	Mean	SD	Kurtosis	Skewness	Range	Maximum	Minimum	Variance	SE Mean
1. TEAMSIZ	11.31	10.49	1.43	1.58	38.00	40.00	2.00	110.06	1.68
2. AVTMAGE	3.34	0.68	0.32	-.23	3.00	5.00	2.00	0.46	0.10
3. CHALLENGE	18.93	4.05	0.26	-0.06	20.00	29.00	9.00	16.39	0.59
4. CLIMATE	155.128	18.65	-0.39	0.44	77.00	202.00	125.00	347.72	2.72
5. COMPOSTN	14.41	2.51	-0.18	0.09	11.67	20.00	8.33	6.31	0.37
6. ENABLE	22.41	3.72	-0.23	-0.49	15.00	28.00	13.00	13.80	0.54
7. ENCOUR	19.59	4.83	-0.90	0.01	18.33	29.00	10.67	23.33	0.70
8. INSPIRE	16.39	4.24	-0.23	-0.09	19.00	25.00	6.00	17.97	0.62
9. NORMS	14.86	2.14	0.26	0.36	10.00	20.00	10.00	4.58	0.31
10. LEADER	98.63	16.97	-0.83	-0.19	64.33	127.00	62.67	287.97	2.47
11. MODEL	21.59	4.00	-0.77	-0.05	16.67	29.00	12.33	16.02	0.58
12. MOTIVATN	16.95	1.76	8.12	-1.77	11.00	20.00	9.00	3.10	0.26
13. TEAMORG	65.82	8.00	0.64	0.62	38.00	90.00	52.00	63.99	1.17
14. ORIENTN	10.58	2.25	0.54	0.40	11.00	17.00	6.00	5.06	0.33
15. PARTICIP	44.23	6.72	-0.44	0.06	28.50	58.00	29.50	45.13	0.98
16. QUALS	4.34	1.39	0.67	-1.23	5.00	6.00	1.00	1.92	0.20
17. JOBSAT	10.50	1.94	0.03	-0.53	8.00	13.00	5.00	3.77	0.28
18. GENDER	1.05	0.11	3.17	2.09	0.38	1.38	1.00	0.01	0.16
19. SOCDESIR	17.71	3.18	1.86	0.92	16.50	29.00	12.50	10.11	0.46
20. SUPPINNO	26.45	3.71	0.33	0.69	16.00	36.00	20.00	13.78	0.54
21. TASKORNT	23.88	4.09	1.19	0.97	20.00	35.00	15.00	16.75	0.60
22. TENURE	11.37	4.43	0.44	0.75	20.00	23.00	3.00	19.61	0.65
23. ROLE	6.51	1.66	-0.06	-0.31	7.00	9.00	2.00	2.74	0.24
24. TASKSTR	18.59	3.02	6.09	-1.67	19.00	25.00	6.00	9.14	0.44
25. VISION	42.80	4.88	-0.40	0.18	22.00	55.00	33.00	23.79	0.71
26. CUSTSAT	54.42	7.69	-1.03	0.14	28.00	69.00	41.00	59.08	1.36
27. COMPLEX	25.69	3.52	-0.88	0.28	12.00	32.00	20.00	12.41	0.62
28. NETINCME	403190.35	770185.15	28.04	4.94	4868517.00	4868517.00	0.00	593185161115.00	117452.13
29. PRODUCTY	2.66	1.40	4.17	1.53	7.75	7.75	0.00	1.97	0.22
30. PROJVALU	23.75	31.80	6.61	2.39	149.00	150.00	1.00	1011.28	4.97
31. DURATION	93.19	50.04	-0.68	0.48	158.00	183.00	25.00	2503.90	12.51

Table 5.7: Summary Descriptive Statistics for all Variables

1. An exploration of relationships between each pairing of independent and dependent variables. Because in social science research it is rare for data to graph exactly as a straight line, we seek a line that fits the scatter of data points in a way which provides for any given value of x the best estimate of the corresponding value of y. We are then able to predict y from x using the least squares method of linear regression.

2. An examination of relationships that involve more than two variables to determine whether the relationship between two variables is due to the presence of one or more additional variables. Here the purpose will be to eliminate indirect correlations and undertake causal modelling (Sirkin, 1995). The partial correlation coefficient will be used to determine the amount of relationship not attributable to other variables in the taxonomy.

3. A multi-variate examination of relationships in the model using more than one independent variable to determine the relative importance of our independent variables as predictors of team climate and team performance. Multiple Linear Regression and Stepwise Multiple Regression techniques will be used to find the best independent variable(s) for predicting the dependent variable(s).

Finally, some of the implications of the results for theory, empiricism and practice will be discussed as a preamble to more detailed consideration in the next chapter.

5.3.5.1. Enabling (Design) Factors and Team Climate

This section will consider the following hypothesis:

H4. *An enabling team organisational environment achieved through design will have a positive effect on team climate.*

5.3.5.1.1. Hypothesis Testing

All of the hypotheses derived from the model of team performance are concerned with relationships between the primary variable groupings, for example, between leadership practices and team climate. But because each of these variable groups is comprised of sub-variables, it is possible to conduct a *fine-grained analysis* of the relationships between specific behaviours and aspects of team climate. This means that our hypotheses are effectively expanded to consider a matrix of 496 relationships. To establish the level of association between the variables a Pearson correlation coefficient was calculated for each pair of variables and the results presented in table 5.8. overleaf. Only coefficients with observed significance levels less than 0.01 are presented. Thus, we can see that there is less than a one per cent chance, for example, that the association between group composition and participation is an inferential error.

We should recognise here that there is a possible type 2 error. A 5 per cent significance level means that we would expect one test in 20 to produce a significant result even if there are no correlations in the data. In a matrix of 496 relationships 25 significant relationships can appear by chance; even at $p < .01$ we would expect to see five such relationships. To avoid this, it was decided to reduce the significance level by dividing the single test value by the number of tests performed (*Bonferroni correction*). For 500 tests this suggests that we should look for p-values as small as .0001 on individual correlations. These variable pairings are presented in table 5.9. overleaf. The significance of the associations between key independent and

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1. TEAMSIZ															
2. AVTMAGE															
3. CHALLGE															
4. CLIMATE															
5. COMPOSTN															
6. ENABLE															
7. ENCOUR															
8. INSPIRE															
9. NORMS															
10. LEADER															
11. MODEL															
12. MOTIVATN															
13. TEAMORG															
14. ORIENTN															
15. PARTICIP															
16. QUALS															
17. JOBSAT															
18. GENDER															
19. SOCDESIR	.42														
20. SUPPINNO															
21. TASKORNT			.75	.76											
22. TENURE			.51												
23. ROLE															
24. TASKSTR	.73														
25. VISION			.46	.45	.54										
26. CUSTSAT															
27. COMPLEX															
28. NETINCME															
29. PRODUCTY															
30. PROJVALU						.67						.41			
31. DURATION												.81			.63

Table 5.8: Pearson Correlation Coefficients for All Variables ($p < .01$)

dependent variables in the model of team performance gives us confidence that we should proceed to regression analysis to explore causality.

	Satisfaction	Motivation	Social Desirability	Task Orientation	Support for Innovation	Shared Vision	Participative Safety
Challenging		.57		.53			
Composition			.55				
Modelling						.57	
Inspiring		.54					
Enabling			.50				.61
Orientation						.50	
Task Structure	.73						
Norms			.52	.51	.51		.49

Table 5.9: Pearson Correlation Coefficients for Hypothesised Variable Pairings with Significance Level $p < .0001$ (NB. Independent Variables in Columns, Dependent Variables in Rows)

The research model predicts that variations in team climate will be mainly attributable to three groups of design factors: leadership practices, team organisation and team performance orientation. Multiple linear regression (MLR) is used to measure the effect that these three factors have on team climate. MLR is a powerful mechanism for analysing a wide variety of behavioural situations because it attempts to determine whether one variable predicts another and, if it does, whether or not this relationship is due to their joint relationship with another variable (Hammond, 1995: 364). Initially, ten independent variables are included in the model (five dimensions of leadership style, four dimensions of team organisation, and one dimension of team orientation) together with the four team climate factors and social desirability. In addition, the job satisfaction and internal work motivation factors are included and treated as dependent variables. To examine the strength of the relationships between different pairings of variables each of the independent variables is regressed separately onto the seven dependent variables. The results of the bivariate analyses are shown in matrix form in table 5.10 overleaf.

	VISION		SOCDESIR		PARTICIP		TASKORNT		SUPPINNO		JOBSAT		MOTIVATN	
	R2	F	R2	F	R2	F	R2	F	R2	F	R2	F	R2	F
INSPIRE	.18	9.95	.19	10.27	.20	11.02	.14	7.54	.21	12.00	.17	8.95	.29	18.25
MODEL	.33	21.88	.21	12.34	.37	27.03	.17	9.13	.23	13.70				
ENABLE			.24	14.62	.19	10.92	.17	8.98	.20	11.06				
ENCOUR			.18	9.78	.22	12.72	.28	17.50	.21	12.18			.18	9.70
CHALLENGE	.15	7.74	.31	19.89	.24	14.36			.21	12.25			.33	22.18
COMPOSTN			.27	16.92			.26	15.45	.26	15.64	.53	50.42		
TASKSTR							.06	8.36						
NORMS	.17	9.05												
TENURE														
ORIENTN	.25	15.19												

Table 5.10: Multiple Linear Regression Model Separately Regressing Seven Dependent Variables Onto Ten Independent Variables.

	VISION		SOCDESIR		PARTICIP		TASKORNT		SUPPINNO		JOBSAT		MOTIVATN	
	P	M	P	M	P	M	P	M	P	M	P	M	P	M
INSPIRE	.68	.39	.74	.36	.76	.38	.54	.31	.71	.41	.36	.14	.82	.54
MODEL	.86	.57	.80	.37	.66	.38	.75	.35	.75	.43	.36	.19		
ENABLE			.34	.50	.87	.35	.46	.34	.20	.51				
ENCOUR			.75	.29	.49	.44	.77	.46	.69	.41			.68	.55
CHALLENGE	.70	.35	.39	.64	.31	.48			.87	.40			.72	.58
COMPOSTN							.60	.43	.36	.44	.08	-.14		
TASKSTR			.54	.35	.31	.09								
NORMS	.61	.36					.68	.43						
TENURE														
ORIENTN	.49	.52												

Table 5.11: Partial Correlation Coefficients Controlling for the Effects of Project and Team Member Characteristics.

Examination of the matrix provides some insights into the nature of the relationship between different aspects of the enabling or design factors and team climate, job satisfaction and internal work motivation. It was hypothesised that leadership practices would predict the greatest variation in the vision dimension of team climate.

This was the

case, but not as expected. The leadership practice, inspiring a shared vision, accounted for $r = .18$ of the variation compared with $r = .33$ for the modelling practice.

The *a priori* expectation that enabling leadership practices would account for the greater variation in team members propensity to participate in team processes was supported ($r = .37$). The strength of this relationship is probably a function of the team leader's ability to nurture trust in the team and to encourage member involvement by devolving decision-making power, developing co-operative relationships and getting the team to feel that they own the projects that they are working on. Leadership practices were also predictive of task orientation and support for innovation. The modelling practice was again a significant predictor, accounting for 23 per cent of the variation in support for innovation. This mirrors Anderson and West's conclusion that "group support for innovation will be stronger to the extent that the group leader is supportive of innovation" (Anderson and West, 1992: 10). Similarly, and as anticipated, the challenging leader practice was an important predictor of the team's propensity for task orientation ($r = .28$).

In terms of the relationship between the team organisation factors and team climate, neither tenure nor task structure were significant predictors. Group composition and group norms, however, were both influential. Group composition explained 22 per cent of team member's participation in team processes and was also predictive of social desirability ($r = .31$). Interestingly, the single most consistent predictor of the

team climate factors was group norms. In all but one case, group norms accounted for approximately one quarter of the variation in team climate and was significant at the .001 level. Finally, team performance orientation was predictive of both team vision ($r = .25$) and task orientation ($r = .16$).

Further, to determine whether or not the relationship between the variable pairings with a significant coefficient of determination ($p < .01$; .001) was a result of the effect of other variables, partial correlation coefficients were computed. These controlled for the effects of team member characteristics (M) (qualifications, role, gender, age) and the nature of the project (P) (value, duration and complexity). The results are presented above in table 5.11 on page 195. Because most of the partial correlations do not approach zero we can say that the relationships between the variable pairings are direct. The size, value and complexity of the project (P) does not affect the impact of the enabling factors on team climate, suggesting that design interventions are relevant whatever the characteristics of the project. Although the partial correlations for member characteristics (M) are generally slightly lower, the same logic applies.

These results provide sufficient evidence to reject the null hypothesis (H_4) and to confirm the consequent that an enabling team organisational environment will have a positive effect on team climate: all of the leader practices together with group composition, group norms and team orientation are linearly correlated with various dimensions of team climate. The coefficients of determination for tenure and task structure, however, do not have a significant impact on team climate.

Having reviewed the relationships between different enabling or design and climate variables and established some important linkages, stepwise regressions are computed to find the optimal prediction of team climate. Because tenure and task

structure are not predictive of any of the climate variables, these two variables have been removed from the equation. In order to select the best combination of predictors to account for the variation in team climate a stepwise regression analysis was computed. Stepwise selection techniques allow the computer to experiment with different combinations of independent variables. Table 5.12. below presents the results of the stepwise analysis.

Dependent (Adj. R-Square)	Vision (.44)			Support for Innovation (.36)			Participative Safety (.43)		
Independent	Beta	T	Sig. T	Beta	T	Sig. T	Beta	T	Sig. T
Orientation	.38	3.29	.0020				.50	4.11	.0002
Enable									
Challenge				.43	3.53	.0010	.30	2.49	.0167
Norms									
Composition									
Model	.47	4.11	.0002						
Inspire									
Encourage				.37	3.04	.0040			
Dependent (Adj. R-Square)	Task Orientation (.36)			Composite Climate (.45)			Social Desirability (.49)		
Independent	Beta	T	Sig. T	Beta	T	Sig. T	Beta	T	Sig. T
Orientation									
Enable									
Challenge	.39	3.04	.0040						
Norms	.35	2.74	.0089	.49	4.34	.0001	.28	2.39	.0213
Composition							.44	3.93	.0003
Model									
Inspire							.31	2.79	.0079
Encourage				.39	3.48	.0011			

(Bold denotes variable entered on step one of the regression)

Table 5.12: Stepwise Regression Analysis - Regressing Team Climate onto Eight Independent Variables.

Table 5.12. shows the 'best' combination of independent variables for predicting the six dependent variables. The removal criteria was based on the default options in SPSS (minimum F value = 2.71; maximum probability of F-to-remove = 0.10). The step analysis was then repeated using both forward selection and backward elimination techniques. The forward selection procedure replicated the stepwise

analysis and this is encouraging. The stepwise procedure confirmed the following predictive relationships:

- between the enabling leader practice and norms and *participative safety*
- between team performance orientation and modelling and *vision*
- between norms, challenging and inspiring and *social desirability*
- between encouraging and norms and *support for innovation*, and
- between challenging and norms and *task orientation*

(NB. Dependent/criterion variables are *italicised*)

5.3.5.1.2. Preliminary Discussion of Results

5.3.5.1.2.1. The significant predictive relationships between group norms and both task orientation and support for innovation confirm that standards of behaviour influence patterns of working and interaction. This suggests that the management of the norm-setting process within newly formed teams can assist the team in adopting a performance strategy which is appropriate to the project task.

5.3.5.1.2.2. Team composition's ability to predict social desirability but not the four dimensions of team climate suggests that team design strategies which rely on achieving what is *perceived* to be an appropriate mix of individual personality, style or skill may not be effective.

5.3.5.1.2.3. Although the relationships were not causal, large teams are associated with significantly lower levels of participation, social desirability, support for innovation, task orientation and shared vision, than is the case in smaller teams. Where large teams are required to manage major projects, special attention must therefore be given to the project's organisation design.

5.3.5.1.2.4. The amount of time spent in the team (tenure) was not predictive of any dimension of team climate, which suggests that support for innovation, shared vision,

task orientation and participative safety *can* be established and sustained from the start and then throughout the team's life-cycle - even in long-term projects.

5.3.5.1.2.5. The task structure variable which was built on Hackman and Oldham's job characteristics model (skill variety, task identity, task significance and autonomy) and relates to the perceived 'richness' of the task was not predictive of any dimension of team climate. This perhaps indicates that the *design of the work* - in contrast to the *design of the team* - is not particularly helpful in creating conditions for high performance project team working.

5.3.5.1.2.6. The significant predictive relationships between the leader practices and dimensions of team climate confirm that a transformational leadership style is highly relevant to the management of projects. However, the precise nature of the relationships between leader practices and aspects of team climate were not as anticipated. For example, the expected relationships between inspiring a shared vision and shared vision and between challenging the process and support for innovation did not materialise. This may be a result of the way the variables have been operationalised by the test developers. The challenging items, for example, emphasise questioning existing work approaches, whereas support for innovation is built on a base of more practical support, such as the provision of time and other resources to develop and apply new thinking. Similarly the visioning leader practice is esoteric in comparison with the tangible and outcome-oriented construction of the shared vision variable. Whether or not the team perceives itself to have a shared vision is strongly related to the team leader's demonstrated behaviour (modelling). So too is it the case with support for innovation; creativity is far more prevalent where team members are appreciated for their contributions. In conclusion, these results suggest that practical behaviour is far more powerful than espoused behaviour in creating a climate for high performance team working.

5.3.5.1.2.7. The causal relationship between team performance orientation and shared vision suggest that corporate HR policies and approaches - notably training and rewards - can be influential in creating enabling conditions for team performance.

5.3.5.2. Enabling (Design) Factors, Team Climate and Team Member Internal Work Motivation and Job Satisfaction

This section will consider the following hypotheses:

H3.1. A positive team climate will have a positive effect on team member internal work motivation and job satisfaction.

H6. An enabling organisational environment achieved through design will have a positive effect on team member internal work motivation and job satisfaction.

5.3.5.2.1. Hypothesis Testing

In accord with the location of the variables in the model, it was anticipated that there would be a stronger relationship between team climate and the affective outcomes than between the enabling or design factors and the affective outcomes. This is consistent with theories which present climate as having a mediating effect on outcomes such as performance and satisfaction (de Witte and de Cocke, 1988; Kopelman, Brief and Guzzo, 1990). Inspection of the correlation coefficients in table 5.8. above however, reveal low to moderate strength relationships between leadership practices, team organisation and team performance orientation and job satisfaction, as well as between the dimensions of team climate and job satisfaction. The only very strong relationship was between task structure and job satisfaction ($r = .73$; $p < .01$). With the exception of tenure, all of the coefficients were significant at the .01 level.

Stronger correlations are found between the enabling or design and team climate factors and internal work motivation. The relationships with challenging ($r = .57$; $p < .01$), encouraging ($r = .42$; $p < .01$) and inspiring ($r = .54$; $p < .01$) leader practices, with team performance orientation ($r = .34$; $p < .05$), and with task orientation ($r = .44$; $p < .01$) are particularly notable. Interestingly, there is only a small correlation between internal work motivation and shared vision ($r = .22$) which may question the application of goal-setting/ achievement theories of motivation (e.g. Locke, 1968) and more recent human resource management initiatives such as performance management (Armstrong, 1995) to the project team environment.

Stepwise multiple regression analyses were then performed with internal work motivation and job satisfaction separately regressed onto only those team climate and enabling/design variables that had produced significant correlation coefficients. The results are presented in table 5.13 below:

Dependent (Adj. R-Square)	Internal Work Motivation (.31)			Job Satisfaction (.57)		
	Beta	T	Sig. T	Beta	T	Sig. T
Task Structure				.67	6.77	.0000
Modelling				.26	2.60	.01
Challenging	.57	4.71	.0000			

(**Bold** denotes variable entered on step one of the regression)

Table 5.13: Stepwise Regression Analysis - Finding the Best Predictive Model of Internal Work Motivation and Job Satisfaction.

Only two variables were retained in the satisfaction model - task structure and the modelling leader practice - but these accounted for 57 per cent of the variation in job satisfaction (adjusted R-Square). Task structure was expected to figure in the equation because the questionnaire items which form both its factor and the job satisfaction factor are drawn from the revised Job Diagnostic Survey (Hackman, 1988) and are an intrinsic part of the job characteristics model (Hackman, Oldham,

Janson and Purdy, 1975). Its beta value was large (.67), and its T was significant (.0000). The motivation model was equally specific. Only the challenging leader practice was retained in the model which explained 31 per cent of the variation in internal work motivation (beta = .57; Sig. T = .0000).

The results lead us to accept the null hypothesis that a positive team climate will not have a positive effect on job satisfaction and internal work motivation within the population of project teams (H3.1). However the multi-variate analysis does confirm the existence of a linear relationship between challenging leader practices and internal work motivation, between task structure and job satisfaction and between modelling leader practices and job satisfaction. This allows us to reject the null hypothesis that an enabling organisational environment achieved through design will not have a positive effect on team member internal work motivation and job satisfaction (H6) and to confirm the consequent.

5.3.5.2.2. Preliminary Discussion of Results

5.3.5.2.2.1. The results confirm existing theories about the determinants of motivation and satisfaction at work. Internal work motivation can be heightened where the team leader provides a challenging work environment, while intrinsic job satisfaction is directly attributable to the characteristics of the job (skills variety, task variety, etc.). However, because the design of the work does not appear to be an important contributor to the creation of conditions for high performance team working, other sources of job satisfaction may be more important in the project team environment.

5.3.5.2.2.2. Building on the point above, the causal relationship between modelling leader practices and job satisfaction is helpful, providing further evidence that

transformational leadership practices are critical in creating a positive work environment for individuals in project teams.

5.3.5.3. Enabling (Design) Factors, Team Climate, Internal Work Motivation and Job Satisfaction and Project Performance

Having considered the positioning of team climate as a dependent variable which is predicted by the enabling or design factors on the left hand side of the model, we now turn to an examination of the relationships between the various predictor variables and team performance on the right hand side. This extends the analysis from the variables operationalised within one instrument to an analysis which employs a broader range of measures, notably the customer satisfaction survey and Conorg's own performance measures. This will be structured as follows. Firstly, we will briefly consider the integrity of the customer satisfaction measure. Secondly, we will look at the relationship between team climate and team performance. And thirdly, we will determine whether or not a direct relationship exists between the enabling or design factors, job satisfaction and internal work motivation and team performance as part of the development of an integrated model.

5.3.5.3.1. Integrity of the Customer Satisfaction Measure

Because of the ratio of questionnaire items to the number of responses (approximately 1:1) it was not feasible to conduct a factor analysis of the customer satisfaction items (Stevens, 1986). However, inter-item correlations were significant and it was therefore considered appropriate to use a composite measure of customer satisfaction derived from the aggregate of the 31 items.

5.3.5.3.2. Team Climate and Team Performance

This section will consider the following hypothesis:

H1. A positive team climate will have a positive effect on customer satisfaction, team productivity and project income.

5.3.5.3.2.1. Hypothesis Testing

Examination of the correlation coefficients in table 5.8. above indicates that there are no significant relationships ($r > .20$) between customer satisfaction and any of the four-factor dimensions of team climate (vision, participative safety, support for innovation, task orientation). There is a higher correlation between social desirability and customer satisfaction ($r = .30$) which may be evidence that a client's perception of the performance of the team will be sensitive to the team's self-image, whether this is positive or negative. Similarly, there are no significant correlations between team climate and net income, although there is a negative relationship between participative safety and net project income ($r = -.25$). There are more encouraging relationships between team climate and productivity. Support for innovation and participative safety both achieved a positive correlation of $r = .20$, while the coefficient between task orientation and productivity is significant at the five percent level of certainty ($r = .33$).

These results do not provide any initial evidence that team climate is predictive of customer satisfaction in the population of project teams that we are interested in. Only social desirability was therefore included in the regression model and explained a modest eight per cent of the variation in customer satisfaction ($F = 2.23$; signif $F =$

.15). The predictive power of team climate on productivity, however, was more significant. Participative safety, support for innovation and task orientation collectively accounted for 14 per cent of the variation in team productivity (adjusted R-Square). The stepwise procedure refined the model, removing both participative safety and support for innovation from the equation. The R-Square for task orientation climbed to .23 and its F value was both large (8.07) and significant (.0085).

These results lead us to accept the null hypothesis that a positive team climate *will not* have a positive effect on either customer satisfaction or project income, and to reject the consequent. However, there is sufficient evidence to reject the null hypothesis that team climate (specifically the task orientation factor) will not have a positive effect on team productivity, and to accept the alternative.

5.3.5.3.2.2. Preliminary Discussion of Results

5.3.5.3.2.2.1. The Team Climate Inventory was developed to predict innovation in teams. The results of this study suggest that its predictive validity does not extend to other team performance outcomes such as customer satisfaction or project income. This does not invalidate the use of the TCI but nevertheless confirms the difficulties inherent in establishing causal relationships between team processes and team performances.

5.3.5.3.2.2.2. Although none of the climate variables were significant in predicting customer satisfaction, the results did establish a moderate causal relationship between task orientation and productivity, suggesting that task orientation is an important performance norm in the sample population. Because change is the defining characteristic of most project work, the ability to reach and sustain high productivity

in an unstable environment is a function of the team's ability to cope with ambiguous and complex change. This *reflexivity* is a key facet of the task orientation factor.

5.3.5.3.3. Enabling (Design) Factors, Job Satisfaction and Internal Work Motivation and Team Performance

This section will consider the following hypotheses:

H3.2. High levels of team member motivation and satisfaction will have a positive effect on customer satisfaction, team productivity and project income.

H6. An enabling organisational environment will have a positive effect on customer satisfaction, team productivity and project income.

5.3.5.3.3.1. Hypothesis Testing

The first hypothesis can be dealt with quickly. There is no evidence to support the proposition that either job satisfaction or internal work motivation is related in any way with customer satisfaction, productivity or project income in the population of project teams.

The relationship between the enabling or design factors and team performance, however, is more interesting. The most striking result is the clear relationships between the cluster of leadership variables and customer satisfaction and between the cluster of team organisation and performance orientation variables and productivity. This is shown pictorially in figure 5.1 overleaf:

VARIABLE	<i>Customer Satisfaction</i>	<i>Project Income</i>	<i>Team Productivity</i>
LEADER	✓	X	X
Challenge	✓	X	X
Enable	X	X	X
Encourage	✓	X	X
Inspire	✓✓✓	X	X
Model	✓	X	X
TEAMORG	✓	X	✓
Composition	X	X	✓
Norms	X	X	✓✓
Tenure	✓✓	X	✓
Task Structure	X	X	<✓>
ORIENTATION	X	X	✓

- ✓ Correlation coefficient greater than $r = .20$
- ✓✓ Correlation coefficient significant at five per cent level of certainty
- ✓✓✓ Correlation coefficient significant at one per cent level of certainty

Figure 5.1: Relationships between the Enabling or Design Factors and Team Performance

With the exception of the enabling leader practice, all of the leader practices are related to customer satisfaction. This relationship is exceptionally significant between inspiring a shared vision and customer satisfaction ($r = .50$). None of the leader practices correlate with either project income or productivity. Similarly, all of the team organisation factors and the team performance orientation factor are related to team productivity. The relationship between group norms and productivity is particularly significant. In addition, tenure and customer satisfaction produce a significant correlation coefficient. Again, project income is not related either to team organisation or team performance orientation.

To establish whether these relationships are causal, stepwise regressions are computed to find the best predictive model of customer satisfaction and team productivity. Only the variables with correlation coefficients of at least $r = .20$ are included in the regression equation.

Dependent (Adj. R-Square)	Customer satisfaction			Productivity		
	Beta	T	Sig. T	Beta	T	Sig. T
Inspiring	.42	2.59	.02			
Tenure	.35	2.17	.04			
Task Orientation				.48	2.84	.01

(**Bold** denotes variable entered on step one of the regression)

Table 5.14: Stepwise Regression Analysis - Finding the Best Predictive Model of Customer Satisfaction and Team Productivity.

The results lead us to reject the null hypothesis that an enabling organisational environment achieved through design will not have a positive effect on customer satisfaction and to confirm the consequent. The predictive power of the inspiring leader practice and tenure are especially notable. The null hypothesis that an enabling organisational environment achieved through design will not have a positive effect on productivity, however, is confirmed, although we should not ignore the moderate causal effect of group composition. The null hypothesis that an enabling organisational environment achieved through design will not have a positive effect on project income is confirmed. There is no evidence that any of the variables in the model has an impact on the level of project income achieved.

5.3.5.3.3.2. Preliminary Discussion of Results

5.3.5.3.2.3.2.1. The strength of the relationship between tenure and the inspiring leader practice and customer satisfaction is notable because the two instruments used to measure these variables are independent of each other and not liable to the effects of common method variance.

5.3.5.3.2.3.2.2. These results contrast sharply with the inability of the team climate variables to predict customer satisfaction and thereby challenge the positioning of team climate at the centre of the model of high performance project team working. There is some evidence that an approach which focuses on the creation of ambient

conditions in which appropriate team processes can emerge naturally will be more effective than attempting to engineer an 'ideal-state' model of team working.

5.3.5.3.2.3.2.3. Although tenure and the inspiring leader practice predicted customer satisfaction, none of the other enabling factors were significant predictors. This may be because in completing the customer satisfaction questionnaire the project sponsor was unconsciously evaluating the performance of the project team leader, not the project team. This is not unexpected because of the close relationship between project managers and their clients, but does require us to re-evaluate the criteria which determine stakeholder perceptions of high performance team working. If it is difficult to disconnect client perceptions of team performance from their assessment of the effectiveness of the team leader, then we need to be clear what measures we are using to determine the project team's performance. This will be discussed further in the next chapter.

5.3.5.4. Team Climate and Project Complexity

This section will test the following hypothesis :

H2. A positive team climate will have a moderating effect on the perceived complexity of the project.

5.3.5.4.1. Hypothesis Testing

The ability to manage complexity is key to the success of many projects. We might expect complexity to affect the team's ability to deliver the project efficiently, since having to deal with unforeseen problems can lead to cost escalation and schedule overruns. There are many examples of construction and Information Technology projects that have suffered this fate (e.g. Morris and Hough, 1987). However, the

between-factor correlations of complexity with customer satisfaction, productivity and project income indicates that this is not necessarily the case.

Nevertheless, the management of complexity is an integral part of the project management process. Examination of the correlation matrix above (table 5.8., p. 192) shows that a negative relationship exists between project complexity and two of the four climate variables - vision and task orientation - as well as with social desirability, tenure, performance orientation, job satisfaction and task structure. The relationship between vision and project complexity is significant at the five per cent level of certainty ($r = -.44$).

The regression model included all of the named variables above and the results are shown in table 5.15. below.

R = .50	R ² = .25	Adj. R ² = .03	F = 1.16	Signif F = .3636
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Independent Variable	B	SE B	Beta	T	Sig. T
Tenure	-.09	.15	-.11	-.55	NS
Job Satisfaction	.23	.56	.13	.41	NS
<i>Vision</i>	-.37	.18	-.51	-2.03	.05
Performance Orientation	-.15	.42	-.09	-.35	NS
<i>Social Desirability</i>	-.30	.25	-.03	-.12	NS
Task Structure	-.33	.40	-.22	-.83	NS
<i>Task Orientation</i>	.24	.28	.25	.85	NS

(N.B. Team Climate variables are shown in italics)

Table 5.15: Regressing Project Complexity Onto Seven Predictor Variables

Examination of the betas shows that vision, task structure and tenure moderate perceived project complexity. The importance attached to work breakdown procedures in project management is supported by the inclusion of task structure in the model. Equally, we would expect that the longer that the team is together, the better able it is to understand and deal with a project's complexity. The key predictor

variable, however, is *vision* and this was the only variable retained in the subsequent stepwise regression procedure.

Dependent		Project Complexity	
(Adj. R-Square) (.17)			
Independent	Beta	T	Sig. T
Vision	-.44	-.27	.01

Table 5.16: Stepwise Regression Analysis - Finding the Best Predictive Model of Project Complexity.

The null hypothesis that a positive team climate will not have a moderating effect on project complexity is therefore rejected and the consequent confirmed.

5.3.5.4.2. Preliminary Discussion of Results

5.3.5.4.2.1. Although shared vision was not related to any of the team performance measures, its causal moderating effect on project complexity is significant. Given the high complexity of many construction and other projects, the ability to generate and sustain shared vision amongst team members using analysis, exploration, involvement and sensitive task design and role creation, is a fundamental design activity.

5.3.5.5. Self and Subordinate Ratings of Enabling (Design) Factors, Team Climate and Internal Work Motivation and Job Satisfaction

The final hypothesis is different from the previous hypotheses because it is not concerned with a causal or functional relationship, but with the difference in perceptions of two groups within the sample population: team leaders and team members. In order to establish whether or not there were significant differences between the self-reported perceptions of leadership style, team organisation, team

performance orientation, team climate, job satisfaction and internal work motivation between construction project team leaders and team members, the means of the two groups were compared for differences. The hypothesis that the population means of team leader and team member populations are equal was tested using the parametric t-test. Where the observed significance level for the F-value was small, the separate variance t-test for means was used and where the significance level was large, the pooled variance t-test for means was used. T-test results are presented below in table 5.17.

Variable	Team Leader (n=36) Mean	Team Member (n=193) Mean	t value	2-tail prob.
LEADERSHIP STYLE	3.64	3.05	-5.78	.00
Challenge	3.40	3.06	-2.28	.02
Inspire	3.08	2.56	-3.13	.00
Enable	4.17	3.39	-6.52	.00
Model	3.89	3.37	-3.88	.00
Encourage	3.66	2.94	-5.31	.00
TEAM ORGANISATION	4.73	4.23	-4.20	.00
Composition	3.57	3.35	-1.60	NS
Task structure	4.97	4.60	-2.50	.01
Group Norms	3.92	3.44	-3.49	.00
Tenure	4.53	3.76	-2.76	.01
TEAM PERFORMANCE ORIENTATION	2.69	2.57	-0.90	NS
TEAM CLIMATE	3.73	3.29	-4.25	.00
Participative Safety	3.91	3.73	-5.61	.00
Support for Innovation	4.00	3.51	-3.54	.00
Task Orientation	4.04	3.73	-2.67	.01
Vision	3.22	2.76	-3.73	.00
Social Desirability	3.15	2.72	-3.30	.00
JOB SATISFACTION	3.64	3.37	-1.61	NS
INTERNAL WORK MOTIVATION	4.35	4.18	-1.70	NS

Table 5.17: Comparison Of Group Means For Team Leaders And Team Members Using T-Tests.

The results show that there is a significant difference in the perception of team leaders and team members concerning the presence of the different factors. Why this difference in perception exists is probably not as important as the impact that it has on attempts to intervene in the way that team development processes emerge and combine to create the team's social structure and climate. It is interesting to note that

two of the areas in which a significant difference in perception does not exist between team leaders and team members - team performance orientation and group composition - are largely outside the control of the team leader. Conversely, the three areas where the t value statistic is at its largest are all in the direct control of the team leader: an encouraging and enabling leadership style and the amount of participation by members in team processes. The next chapter will discuss some possible implications of this difference in perception between the two groups. Suffice to say here that the organisation's ability to effect a transformation in the behaviour of the team leader - possibly using 360° feedback as a key part of an overall change management strategy - is critical if the practical application of the work design methodology proposed in this study is to be realised.

These results therefore lead us to reject the null hypothesis that team leaders' ratings of enabling or design factors and team climate will be the same as those of team members and to confirm the consequent. However, the results also confirm the null hypothesis that team leaders' ratings of team performance orientation, job satisfaction and internal work motivation will be the same as those of team members.

5.3.5.6. Effects of Biographical and Project Variables (Single Items)

The effect of directing the quantitative analysis to the level of the group, rather than the individual, is that the aggregated biographical data considers the role, age, qualification and gender *profile* of the project. A summary discussion of the results of the Pearson correlations (table 5.8 above) follows below.

5.3.5.6.1. Reasonable correlations exist between the age profile of the project team and both its duration ($r = .44$; $p = \text{NS}$) and the task structure dimension of the team organisation design factor ($r = .44$; $p < .05$).

5.3.5.6.2. There is a negative relationship between the qualification profile of the project team and four of the five leader practices, as well as with group norms, social desirability, task orientation, support for innovation and customer satisfaction. It would of course be wrong to draw too many conclusions from these results. However, the way that construction project teams in the sample population are currently constituted clearly has a negative effect on some important team processes and, most importantly perhaps, customer satisfaction. This result may reflect some underlying weakness or tension in the teams, but further research is necessary to determine the precise cause of this phenomenon.

5.3.5.6.3. There are negative correlations between the gender profile of the project teams and group composition, four of the five leader practices, vision, task structure, and social desirability. Ungrounded speculation is unwise, although team composition - and particularly diversity within those teams - may again be the point of departure for further research.

5.3.5.6.4. The role profile of the project teams produced some interesting correlations, notably with the enabling leader practice ($r = .56$; $p < .01$), the encouraging leader practice ($r = .42$; $p < .01$) and with participative safety ($r = .34$; $p < .05$).

5.3.5.6.5. Some of the empowering and empowered behaviours such as the enabling leader practice and participative safety diminish on larger projects (as measured by the value of those projects). This may be attributable to a perceived need by the project team leader and/or senior management to create a strong organisational control structure to *effectively manage* the project.

5.3.5.6.6. Finally, the longer the project (duration) the less able the team leader to *sustain* challenging and inspiring leader practices. The latter's relationship with customer satisfaction reported earlier suggests that organisations must pay close attention to supporting and reinforcing these behaviours throughout the project life-cycle.

5.4. Interview Results

5.4.1. Introduction

The interviews conducted with project team leaders are an essential source of evidence because they provide an opportunity to corroborate the results of the quantitative data analysis. The views of well-informed respondents furnish important insights into the factors which contribute to a project's success or failure. However, because interviews are subject to common problems of bias and poor or inaccurate articulation (Yin, 1994: 85) they will be treated as a secondary data source in this study.

The multivariate analysis presented in section 5.3 above identified some significant relationships between the study variables. However, there are two compelling reasons for continuing the analysis using a qualitative methodology. Firstly, there are some noticeable gaps in the results of the quantitative analysis. Only 29 per cent of the variation in customer satisfaction and 20 percent of the variation in productivity is explained by variation in the predictor variables. Although it is rare to see coefficients of determination approaching 0.7 or 0.8 in behavioural research, and the significance of the results demonstrate that the relationships are, in any case, 'good' (Sirkin, 1995: 408), a considerable amount of the variation in team performance is left unexplained by the independent variables (i.e. the coefficient of alienation).

And secondly, leadership has emerged as a key predictor of team performance, team climate and motivation in the population of project teams. Team leader behaviour is critical to the success of the project development process. It would be unwise not to allow team leaders to give their own accounts of the factors that they believe account for the high level of productivity/customer satisfaction/income on their projects.

5.4.2. Content Analysis

Quantitative content analysis was used to analyse the textual data gathered during the interviews. Content analysis has both a mechanical and interpretative component (Millward, 1995). The mechanical aspect involves physically organising the data into categories while the interpretative element involves determining which categories relate back to the original unit of analysis. Because at this stage of the research, our analytic strategy is quite clear, we can organise the data according to our theoretical propositions.

The interview material was read by the author and a category created each time a new element was mentioned. A mark was recorded each time the variable was mentioned. 40 elements emerged from the data. These were reviewed and assigned to one of six categories in a coding frame: team organisation, team performance orientation, leadership style, team climate, project complexity, individual motivation. These were based on the major variable groupings in the taxonomy of project team performance. It was possible to allocate 21 elements into the coding frame. Consideration of the other 19 elements, however, suggested that three other categories were needed.

These were interpreted as:

- process management
- technology

- boundary relations

Three of the team leaders were asked to substantiate these categories and they concurred with the author's interpretation.

Each of the elements and their frequency of occurrence during interview are presented in table 5.18. overleaf.

5.4.3. Discussion of Results

The results confirm the importance of team organisation, team performance orientation and team climate in the model, but also suggest that there are significant other factors which might account for some of the unexplained variation in the regression model.

5.4.3.1. Factors in the Model

4.3.1.1. Team Organisation

Team composition and team tenure were the two team organisation factors which occurred in the team leader's explanation of their team's performance most frequently. Composition, though, was discussed more as a chance convergence of people who could work together well, rather than the a conscious design activity. For example:

"I inherited this team and they came from all over. I didn't have a real say in who I wanted. A couple of them had worked together before and this helped. I was lucky that I got a good mix of guys".

Category	Frequency of Occurrence	% of Total
TEAM ORGANISATION	37	20.11
Team Composition	12	6.52
Open Plan Office	3	1.63
Team tenure	8	4.35
Amount of time spent at work	5	2.72
Team organisation structure	5	2.72
Clear roles and responsibilities	4	2.17
TEAM PERFORMANCE ORIENTATION	3	1.63
Commitment to company/region	1	0.54
Organisation tenure	1	0.54
Reward	1	0.55
TEAM CLIMATE	34	18.48
Team Cohesiveness	10	5.43
Commitment to project aims and objectives	7	3.80
Identification with high profile project	3	1.63
Positive attitude	6	3.26
Internal communications	8	4.36
PROJECT TASK	13	7.06
Technical complexity	2	1.09
Speed of programme	5	2.72
Regular targets to be achieved	3	1.63
Familiarity with project	1	0.54
Project financed by Conorg	1	0.54
Fees agreed at project commencement	1	0.54
PROCESS MANAGEMENT	30	16.30
Management of design	9	4.89
Effective, early planning	5	2.72
Clear brief, strategy, objectives	3	1.63
Management of services installation	5	2.72
Procurement strategy	5	2.72
Management of programme	3	1.62
BOUNDARY RELATIONS	62	33.70
Relationship with client	12	6.52
Relationship with architect	11	5.98
Relationship with trade contractors	8	4.36
Level of trust between parties	7	3.80
Involvement of trade contractors in decision-making	3	1.63
Good communications between parties	8	4.36
Knowledgeable client	3	1.63
Relationship with public	1	0.54
Management of other parties	2	1.09
Relationship with Quantity Surveyor	2	1.09
Quality of trade contractor work	5	2.70
TECHNOLOGY	1	0.54
Information technology	1	0.54
INDIVIDUAL CHARACTERISTICS	4	2.18
Individual standards	3	1.63
Flexibility	1	0.55
TOTAL	184	100.00

Table 5.18: Content Analysis of 15 Interviews with Project Team Leaders.

In most instances, the team leader was forced to make the best of a situation over which he had little direct control. Because construction is a fluid industry, teams are constantly formed and reformed, and team leaders expect to lose and acquire team members almost as an inevitable part of the project development process. However, where the team can maintain some degree of member continuity between projects, this can be beneficial.

“We had the core of this team at [previous project] and it is now pretty well established. There was a conscious decision to keep this team together for [this project]. We didn’t have sector experience in this client’s business to offer, so we gave them something else - a successful and visible building that we had just finished”.

Because of their frequent exclusion from the selection process, team leaders recognise the importance of focusing the team by establishing structure and norms. Examples of each are given below. First structure:

“I always sub-divide the job into geographical areas and say to each manager ‘that’s yours’. They welcome this clear accountability and feel that they are not just some cog in the wheel”.

Now, norms:

“John started off as the project manager with Peter assisting. John had to go off-site and Peter was put into [another project]. I came in to replace both Peter and John. Within four weeks I was doing the job of three people. I have caressed and bullied the team. I take them out, feed them and get them pissed, and this injects team spirit.

There is no point saying we can't cope - they know that we have to look for short cuts and get on with it".

5.4.3.1.2. Team Performance Orientation

The role of the parent organisation in orienting the team towards high performance was not articulated by team leaders. Like composition, team leaders have limited power to influence the distribution of rewards to their team members:

"My people are happy with the way things are - there is no great discontent other than the raw deal they got at the last salary review".

Similarly, there were no examples of the way that training was used to orient the team towards high performance.

5.4.3.1.3. Team Climate

Team climate is used to refer to a range of team behaviours which team leaders believed facilitated their team's performance. The definition of climate here is different from the operational definition used in the quantitative analysis. However, there are some common themes, notably commitment to project aims and objectives, good internal communications and a positive orientation towards the task. Some examples of the language used by team leaders to describe this are given below:

"Excitement ran all the way through the job because of the speed and criticality of the entire programme. The constant flow of adrenaline kept us going".

“Because of the magnitude of [the project] and the constant media attention, there was a real feeling of importance among the team. Everyone knew that they were important. When we all got together there was a great atmosphere - no conflict, just everyone working to deliver a quality job”.

“Our guys gelled well all the way through. You know if it is going well or not. I let our guys know we were ahead of programme and this gave them satisfaction and motivated them”.

“Our team was good, but not as good as it could have been. We could have taken it up another couple of gears. We missed an opportunity. One of our guys tried to make it more exciting by throwing mud - it diverted people from taking advantage of the spare capacity. In an ideal world people would have distributed the local workload more effectively; we’d have had better co-operation and more time for education”.

5.4.3.1.4. Project Complexity

It was hypothesised that project complexity would act as a moderating influence on the performance of the project but it was difficult to determine from the interviews if this was the case. Two of the fifteen team leaders described their projects as “technically uncomplicated”, although speed of programme was a factor in a third of the cases. One team leader, for example, referred to “the most severe programme; three times faster than the typical [Conorg] job. We were on a knife-edge for 69 weeks. I still feel burnt out from that”. Another reported that “we had a lot to do in the time - only a twenty week programme including Christmas”.

5.4.3.2. Factors outside the Model

This study has considered the relationship between the design of project management teams and the performance of those teams. Its focus has been the application of design to the project environment at three levels: leadership practices, team organisation and team performance orientation. In terms of construction project management, this means that both the technical management of the project development process and the impact of the external linkages between the project management team and the other parties involved in design and production have been excluded. However, it is clear that team leaders believe both the management of the project process and, more importantly, the management of the relationship with other parties involved in value creation to be critical determinants of project success or failure.

5.4.3.2.1. Process Management

The management of large scale projects is characterised by complex information flows and continuous change. Various tools and techniques have been developed to help project teams manage in this environment. Some of these are rooted in the experience of project managers; others have been proceduralised by the parent organisation. In many cases they are simply practical expressions of good leadership practice. Some examples are given below:

“We planned out the whole job with the major subcontractors initially. What they wanted became our programme. This helped to get their commitment to the programme. Despite problems with remedial works on the shell, we kept to the programme and even managed to offer the client acceleration”.

“We interviewed 300 contractors to get the right people for this project”.

“The client had two principal objectives really: to stay within budget and to get as close to the design as was affordable. We all knew this - it was a clear brief”.

“We had an absolutely clear strategy from day one. We set our milestones and always find ways to meet them. Everyone knows exactly what they are working to”.

5.4.3.2.2. Boundary Relations

Of the eight factors identified from the interviews, boundary relations was most frequently cited as affecting the performance of the project team. It is probably no coincidence that partnering continues to be the focus of considerable attention in the UK construction industry (Murphy, 1994; Latham, 1994) and elsewhere, although its practical implementation is proving problematic. Partnering is defined as “a strategy for a relationship-based association based on trust, co-operation and mutual benefit” (Murphy, 1994: 15). Partnering involves extending team working to incorporate the various parties involved in the project development process. There are several partnering models which can involve either singular (project specific) or serial (annuity) relationships. Although none of the projects discussed by the team leaders involve such formalised partnering relationships, the benefits that can accrue from extended team working beyond the team’s immediate organisational boundaries are apparent in the quotes below.

“We had a client who anticipated that we would achieve what he wanted. He listened and took advice when we offered it. We have worked together now on and off for ten years on different projects”.

“I personally don’t like the importance given to the Project Manager. He is only as good or bad as the combined efforts of the client, [Conorg], design and trade contractor teams”.

“We kept the communication going throughout the job. We encouraged different trade foremen to speak to each other and they sorted it out themselves. They are the specialists; they know what they are doing. They don’t need us to solve their problems for them”.

“There were lots of mistakes in the design which has caused a few strains in the relationship. The design team has cost us money”.

“The client has been a bit tentative with us because we are taking more than the usual amount of risk. He is surprised that we are so conciliatory. He is sitting on the fence waiting for the sting - but the sting won’t come”.

“We meet as a design team with the client four hours each week. Every three weeks we meet with the client’s project manager who can intimidate. We have learned not to rise to that”.

“We had one or two problems with the design and the client changing his mind, but we put the architect on site and he worked as part of the team”.

“There are two teams here: the client, PQS and Project Manager and us and the subcontractors. The client gets a distorted picture on the cost side. We cannot directly influence his opinions”.

“The team was all picked from the Guildford area, including the architect. We had a lot in common”.

“We were prepared to help the client team explain the project to the public. We held their hands on gala and open days, where they felt vulnerable”.

“The turning point happened at a change order preview session. There were 55 in the client team and 8 of us [from Conorg] around the table. I read them extracts from previous minutes and pointed out the number of changed decisions. They understood. From that moment the job was different”.

“We have had four Christmas parties now and if you’re standing at the back of the room you cannot tell who is employed by whom”.

5.4.4. Conclusions

The content analysis of the team leader interviews generally support and amplify the results of the quantitative analysis. In particular, team organisation and team climate were identified as significant determinants of project team performance. Collectively, these variables accounted for almost 40 per cent of the team leaders’ accounts. But the team leaders’ perceptions also highlight the importance of *process management* and, notably, *boundary relations* as determinants of project team performance. Further research is needed to determine whether or not boundary relations will add significantly to the explanatory power of the taxonomy of team performance. Nevertheless, it is highly likely that the design principles discussed in this research could be applied to all of the teams involved in the value creation process, as a way of integrating the disjointed and fragmented project development process in construction.

5.5. Summary of Results

This final section will summarise the main findings arising from the data analysis procedures.

5.5.1. Factor Analysis

5.5.1.1. The factor analysis of the Leadership Practices and Team Climate items generally confirmed the reliability and validity of the instruments for use with project teams.

5.5.1.2. The part-exploratory, part-confirmatory factor analysis of the team organisation, team orientation, job satisfaction and internal work motivation items extracted seven interpretable factors which were consistent with the *a priori* model. These were composition, tenure, norms, task structure, performance orientation, job satisfaction and internal work motivation.

5.5.2. Descriptive Statistics

5.5.2.1. Comparison of the data with referent data for the normative population suggested that team leaders in the sample demonstrate leadership practices which are less 'transformational' than is usual.

5.5.2.2. Similarly, less time, effort and support is devoted to innovation than is typical elsewhere (support for innovation).

5.5.3. Hypothesis Testing

The results of the multivariate analysis confirm the following hypotheses:

H2. A positive team climate will have a moderating effect on the perceived complexity of the project.

H4. An enabling organisational environment achieved through design will have a positive effect on team climate.

H5. An enabling organisational environment achieved through design will have a positive effect on project performance

H6. An enabling organisational environment achieved through design will have a positive effect on team member internal work motivation and job satisfaction

H7. Team leaders' ratings of leader practices, team organisation and team performance orientation, team climate and job satisfaction and internal work motivation will be more favourable than the assessments of team members.

Experimentation failed to confirm the predicted relationships in the following hypotheses:

H1. A positive team climate will have a positive effect on customer satisfaction, team productivity and project income.

H3.1. A positive team climate will have a positive effect on team member internal work motivation and job satisfaction.

H3.2. High levels of team member internal work motivation and job satisfaction will have a positive effect on customer satisfaction, team productivity and project income.

Significant relationships between specific dimensions of the enabling or design, climate, job satisfaction, internal work motivation, project complexity and team performance variables are presented diagrammatically in figure 5.2. overleaf.

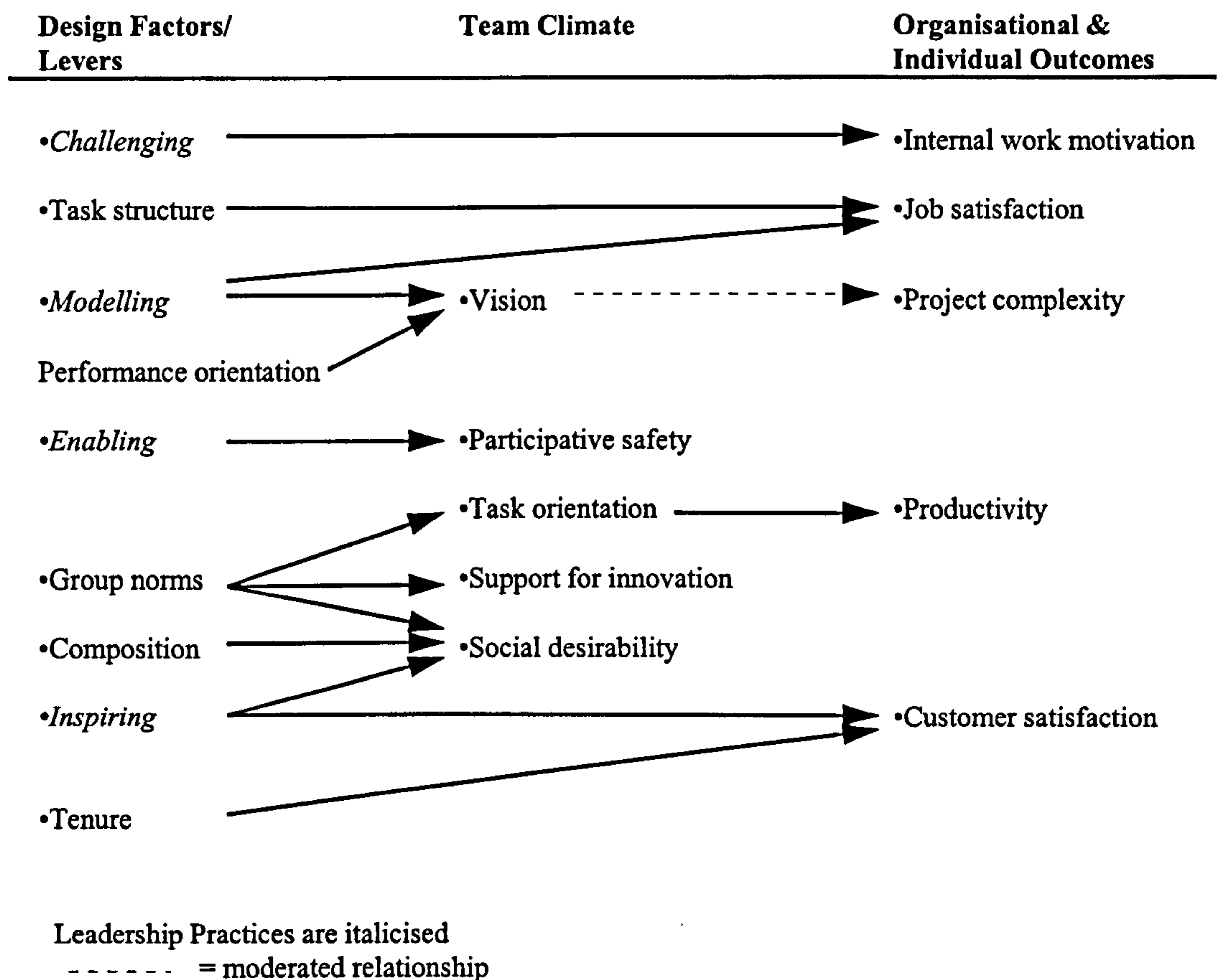


Figure 5.2: Significant Causal Relationships between Predictor and Criterion Variables in the Taxonomy of High Performance Project Team Design

5.5.4. Interview Results

5.5.4.1. The interview results confirmed the importance of team organisation and team climate as predictors of team performance in the model.

5.5.4.2. Process management and the management of relationships with other parties involved in the value creation process were identified as significant determinants of performance, accounting for exactly half of the content of the interviews with project team leaders.

6.0. DISCUSSION OF RESULTS

6.1. Introduction

Having constructed a theory and a taxonomy of project team performance in chapters two and three, proposed and described a method for examining the relationships between the different phenomena in the taxonomy in chapter four, and then tested those relationships using bi-variate and multivariate data analysis techniques in chapter five, this chapter will discuss the results and their meaning at three levels of analysis: theoretical, empirical and practical. The organisation of the chapter will follow the style introduced in chapter five. There will be a principal discussion section for each of the hypotheses as follows:

1. Team Climate and Project Performance (customer satisfaction, productivity and income)
2. Team Climate and Project Complexity
3. Team Climate, Internal Work Motivation and Job Satisfaction and Project Performance
4. Enabling (Design) Factors (leader practices, team organisation and team performance orientation) and Team Climate
5. Enabling (Design) Factors and Project Performance
6. Enabling (Design) Factors and Internal Work Motivation and Job Satisfaction
7. Self and Subordinate Ratings of Enabling (Design) Factors, Team Climate and Internal Work Motivation and Job Satisfaction

Following a brief reprise of the results of the hypothesis tests, each of the relationships will be discussed at three levels. The first level will discuss issues arising at the theoretical level. This will concentrate on the major issues developed throughout the study, for example, the innovation-efficiency dilemma, the relationship between work organisation design and organisational performance, and issues surrounding the management of team design vis-à-vis the management of team

process. The second level will consider some of the empirical issues arising from the results. This will focus discussion on what the results actually tell us about the relationship between two or more variables and whether or not this supports or refutes findings from earlier research. The third and final level of analysis will consider some of the practical issues emerging from the results. This will address the meaning of the results for the applied environment and discuss some practical outcomes.

6.2. Team Climate and Project Team Performance

6.2.1. Summary

The results of the various statistical tests applied to the relationships between the four dimensions of team climate and the three team performance measures indicate that there is no significant, causal relationship between team climate and customer satisfaction and net project income in the population of construction project teams. Stepwise regression analysis did not extract any team climate variables for inclusion in the regression equation for customer satisfaction or project income. Pearson correlations did, however, indicate a moderate positive relationship between support for innovation, participative safety and task orientation and productivity. The stepwise procedure confirmed that task orientation explains 23 per cent of the variation in team productivity.

6.2.2. Theoretical Issues

Despite the extensive literature on small group effectiveness and the increasing practical application of teams in industry, there have been very few attempts to define or measure the key qualities or dimensions of team work; essentially the way that individuals work together in order to create an effective team. Anderson and West's

(1994) four-factor theory of team climate is innovative because it tries to isolate the ambient or climatic conditions which, when in place, help teams to achieve high performance levels. This is in contrast to much of the existing literature which treats team working as a collection of trite axioms such as action-oriented, persistent and obsessive, driven by success, and so on. At the other extreme team working is described as a set of indeterminate facets or processes without defining what those facets or processes are. Thus self-managed teams are defined by the control that members have over issues such as recruitment or production schedules, rather than by the behaviours and norms that determine effective or ineffective team working and, ultimately, performance. The emphasis is on content rather than process. As we have seen, Anderson and West isolate team vision, participative safety, task orientation, and support for innovation as the main predictors of team performance. These factors propose how a team should work together in a constructive and productive manner. They provide an antidote to the pernicious effects of process losses (Steiner, 1972) and group think (Janis, 1982). Task orientation, for example, encapsulates Tjosvold's (1991) notion of constructive controversy and invites team members to challenge existing work practices and paradigms.

But if team climate is team working at its best, why do the results in chapter four show so little connection between it and customer satisfaction and net project income? Indeed, there is even a small negative correlation between participative safety and project income. Paradoxically, an explanation for this can be found in the area where the climate research breaks new ground. The Team Climate Inventory (TCI) was developed to predict innovation within teams; innovation is therefore the referent outcome. Although Anderson and West (1994) imply that the TCI is predictive of work group performance in general, the measure has only been validated for its ability to predict team innovation. Its predictive validity does not, as yet, extend to other performance outcomes such as customer satisfaction or project income. An organisation's ability to generate innovation is clearly important to its

competitive performance: 3M and the pharmaceutical companies are examples of this. But it is unlikely to be the sole, or necessarily the most important, indicator of performance. This is particularly true in team-based project organisations in the construction and engineering sectors where short-term commercial pressures to make a profit are at least as important as the longer term need for product or service innovation.

This does not invalidate the use of the TCI or Anderson and West's development of climate theory. Instead it lends support to Hogg's (1992) argument that the reason previous research into the relationship between team processes and team performance has presented contradictory evidence is because it has probably failed to isolate the referent group norm that relates to and determines performance in different contexts and over different time scales. Anderson and West (1994) allude to this. Although they suggest that climate is a composite construct which consists of team member descriptions of their social setting, they state that different aspects of the climate will be more or less influential in predicting either quantity, radicalness or novelty of innovations: "Interaction frequency explained 21 percent of the variance in number of innovations, Task Orientation explained 21 percent of the variance in radicalness and Support for Innovation explained 18 per cent of the variance in novelty of the innovations" (1994: 48). This interpretation tempers Gladstein's (1984) conclusion that exclusive attention to internal group processes may be preventing researchers from identifying more profound influences on group performance. Group processes are important, but their character and relevance is different depending upon the referent outcome that the organisation or the researcher is most interested in explaining.

6.2.3. Empirical Issues

Although none of the climate variables were significant in predicting customer satisfaction or project income, the results did show that levels of Task Orientation were associated with levels of productivity. From the foregoing discussion this might lead us to conclude that Task Orientation is an important performance norm in the sample of 49 construction project teams. In terms of the task performed by the teams and the environment that they are working in, this would make sense. Construction projects are both complex and unique and it is unlikely that a technical solution applied to one project could be applied in exactly the same way to a second or third project. Anderson and West (1994) state that reflexivity is an important dimension of Task Orientation. Reflexivity refers to the way in which teams must be able to live with ambiguity and complexity and to adapt to changing circumstances by modifying their performance strategies. The life-cycle of a construction project is marked by continuous change in the development of the project, in personnel, in the weather, and so on. Maintaining high levels of productivity will be a function of the team's ability to successfully manage change and to apply new learning to novel situations.

Climate showed a stronger relationship with productivity than with either income or customer satisfaction. The significance of climate's inability to predict customer satisfaction will be discussed in more detail later in the chapter. But in the case of both customer satisfaction and income it might be argued that the performance measure is more 'distant' from the influence of the team's climate than from productivity and therefore subject to more outside effects. The level of income, for example, can be influenced as much by commercial negotiations before the project begins as by anything that happens during the life of the project. Productivity is a measure of the number of team hours expended as a proportion of the overall value of the project. The ability of the team to reduce the number of hours it spends in

managing the construction of the project can be achieved through the modification of its own internal processes. At its basest level, the team can work harder or faster. Its ability to satisfy the customer by adding value to the project development process, on the other hand, may be moderated by the speculative actions of third parties operating outside the team's boundary, such as architects or trade contractors. As we will see later, perceptions of the team's performance may be associated with the team leader who is frequently the single point of contact with the team's client. The linkage between team climate and customer satisfaction (and project income) therefore becomes diluted.

Future empirical research into the relationship between team climate and team performance must be cognisant of the distance between the two factors in complex organisational environments. In the laboratory, it might be feasible to differentiate between the performance of two teams given the presence of an intervening variable. But in real production situations, such as those found on construction projects, relationships are unlikely to be straightforward or unproblematic. Greater sensitivity is required in identifying the team processes that predict the performances that are valued in different organisational settings. Moreover, attention must be directed to the specification and measurement of performance. Different constituencies or stakeholders may have different or even competing priorities. Having identified what aspect or type of performance is valued (low project cost, speed of completion, high quality, innovation, value-added to the development process, etc.), and the teams that are delivering exceptional performances, it may be possible to target and highlight the critical group processes or norms. It should be noted, however, that this supports the use of a methodology which is focused on single organisations, or possibly specific sectors, in which a detailed examination of teams can take place.

6.2.4. Practical issues

Team development or team building is used widely in construction project management organisations like Bechtel (Martin and Nicholls, 1987). Its rationale is to create a sense of team spirit or team identity, or to improve communications and encourage participation, or to generate a shared vision. Within Conorg, external consultants are employed on an ad hoc basis to work with teams to help them identify and overcome barriers to effective team working. In the main, these interventions are initiated by the project team leader and supported by the team. Evidence of the success or failure of these interventions is anecdotal and inconclusive. Although the results of this research have not identified a causal link between team processes or team climate and project performance, this does not confute this type of team development intervention. However, the results do confirm that team development activities must focus on the specification of performance strategies that deliver valued outcomes.

Effective team development will help team members to understand what performances are valued by the different stakeholders in the project and how - as a group and as individuals - they can ensure that these performances are achieved. A high level of team member participation in problem solving or decision making may be identified as a preferred team condition, but unless increased participation results in improved performance it may be an unnecessary luxury. But when the team leader has defined the performances that are valued by the various constituencies (client, organisation, team), it is important that the development of the appropriate attitudes and behaviours is treated as a process rather than as a one-off event. Development, by its nature, takes place over time and must be seen as an on-going strategy (Huczcz, 1990). A strategy of this sort may involve on-going process assistance provided by an external facilitator or, ideally, by the team leader. But it should also

be enshrined within the project's formal and informal systems and procedures. A project-specific performance management system which encourages coaching and development in support of key performance objectives can act as both an important symbol of the team's purpose and as a mechanism for keeping the team focused on its targets.

6.3. Team Climate and Project Complexity

6.3.1. Summary

Project complexity was proposed as a moderating variable in the research model between team climate and team performance, but the partial correlation procedure did not substantiate this. Nor did the multiple regression procedure suggest that project complexity had an unusually powerful impact on project performance, although there were small negative Pearson correlations with customer satisfaction and productivity. Complexity did reveal small to moderate negative correlations with the vision and task orientation dimensions of team climate, as well as with social desirability, tenure, team performance orientation, job satisfaction and task structure; the strongest relationship was with shared vision ($r = -.44, p < .05$). The stepwise regression procedure confirmed that vision has a negative causal effect on project complexity (Beta = $-.44$) at the one percent level of significance. We therefore conclude from this that the presence of shared objectives among team members has a moderating influence on the perceived complexity of the project.

6.3.2. Theoretical issues

We have noted how, in the population of construction project teams, team climate has a marginal impact on performance and that this may be partly explained by the fact that the team climate factors were developed to predict a team's propensity for

innovation. In chapter one, we discussed the innovation-efficiency dilemma which has been identified by Clark (1986; 1987) as an impediment to effective performance in organisations experiencing the new industrial competition. Industries whose historical competitive advantage was based on cost reduction and small incremental improvements in their production process capabilities now need to combine this with radical changes in their product design. Recent studies of the international car industry (Clark and Fujimoto, 1992; Womack, Jones and Roos, 1990) contrast Japanese producers who are able to integrate radical concept innovation upstream and high standards of quality, productivity and lead-time downstream with Western producers who have struggled to reconcile the two factors. Clark (1987) has argued that the key to reconciliation is in the conceptualisation of product, production process and form of work organisation as a total process which is integrated vertically and laterally. Although in practice, this is being achieved through the application of 'lean' practices such as Just-in-Time, short-cycle jobs and Kaizen, Morley and Hosking (1992) suggest that 'total design' should be based on social psychological principles as well. This may be in conflict with the Japanese lean production model of, for example, Toyota and more aligned to the 'enriched production' model described by Sandberg et al (1995).

Construction projects are extremely complex, particularly in the United Kingdom where the design culture favours the production of 'signature' buildings such as the Lloyd's and Channel Four buildings. The challenge for the construction project team is to transform the Architect's unique design from paper concept into physical construction, often with incomplete or inaccurate design information. Continuous learning, adaptation and problem solving is a prerequisite in the management of the construction process. But despite remarkable achievements such as the Channel Tunnel, Canary Wharf and the Thames Barrier, the construction project sector has been criticised for its poor productivity record (e.g. Latham, 1994). It is argued that

the co-existence of high levels of innovation with relatively low productivity levels is indicative of the innovation-efficiency dilemma in the construction industry.

Given the necessity for team problem solving and learning in the UK construction industry the presence of a moderated relationship between team climate and project complexity in the population of construction project teams is not unexpected. Team climate measures the team's capacity for innovativeness. The ability of project teams to improve their ability to manage complexity can be enhanced by ensuring that the team has a shared vision and a common set of goals that they are all striving to achieve. We might expect that this would also impact on the team's productivity, but this was not supported by the results. Nevertheless, because of the relationship between task orientation and productivity, we can conclude that the existence of shared objectives and the presence of a well-developed task orientation norm will provide the team with the basis from which to manage the innovation-efficiency dilemma in the construction project environment.

6.3.3. Empirical Issues

Participation is the one dimension of team climate that has a long history of empirical research and testing. Partly, this has been a consequence of its association with the literature on employee involvement. Researchers have argued that individuals should be *involved* for ethical reasons (e.g. Sashkin, 1986), and it is likely that this was the rationale behind many of the Quality of Working Life and representative participation programmes that were popular Organisational Development interventions in the 1970s. But the new industrial competition requires that if participation is to remain an organisational characteristic or goal, it must facilitate the attainment of a wide variety of strategic business objectives. Locke and Schweiger (1979) and Schweiger and Leana (1986) in two well-known reviews of existing empirical research found no evidence that participation was predictive of productivity. Guzzo, Jackson and

Katzell (1987), on the other hand, using meta-analytic techniques to review performance effects under different forms of participation (job redesign, socio-technical interventions, gain-sharing), did find a relationship with productivity. The results presented in chapter four of this study do not suggest that organisational benefits accrue from participation in the population of construction project teams. Although there is a small positive relationship between participative safety and productivity, this is insignificant. Even its moderating effect on complexity is the second smallest among the five dimensions of team climate (including social desirability).

We might be able to find reasons for this phenomenon but such explanations tend to be rooted in an ideological attempt to justify participation because it is the 'right thing' to do. We might, for example, cite Lowin's (1968) conclusion that the effectiveness of participation depends on the personality or competence of those involved and the quality of the participation processes in place. Alternatively, we might criticise the definition of participative safety embodied in Anderson and West's conceptualisation of team climate: influence over decision-making, information sharing, interaction frequency and safety (Anderson and West, 1994: 7). Whilst they stress that participation "does not become a paralysis of action but an outcome of a developing and evolving strategy of decision-making" (ibid), we might question their ability to operationalise this definition in their participative safety factor.

The problem with participation - like cohesiveness - is that it is a tenet of most definitions of successful team work. Cotton (1993), for example, states that self-directed teams are characterised by "a formal system of employee involvement, direct employee participation, and a high degree of control" (1993: 174). There are few examples of organisations that have articulated a link between participation and productivity, although the Kaizen activities of Toyota can be cited as one example. Here, the involvement of production workers is directed towards the reduction of

production times and the number of production workers. “Through Kaizen activities, the productive efficiency of each shift is increased, so that its coefficient of productive efficiency rises, which in turn brings higher payment for production” (Shimizu, 1995: 386). But this level of integration is rare and, if participation does not generally lead to improvements in productivity, this challenges the precepts upon which prescriptions for team working and employee involvement are based. Indeed, in his own review of research into the effectiveness of self-directed teams (n = 156 cases), Cotton notes that “the case study reviews portrayed the most positive results in terms of productivity, with less favourable results occurring with the well-delineated case studies and the better-controlled quasi-experimental studies” (1993: 190).

Although shared vision was not related to either productivity, customer satisfaction or project income, its causal moderating effect on project complexity was significant. Anderson and West (1994) emphasise that vision is a shared and negotiated process. However, its importance lies in the focus and direction that it gives to individual team members' work activities. A clear vision may be established among team members at the commencement of the project, and the final project solution may be manifest in the sum of the team members' collective efforts, but much of what happens between the two points will be a result of the level of individual effort brought to bear on the group task (Hackman, 1983). Participation in collective decision-making and the open and free flow of information may not necessarily hinder the task completion process, but the value of group working over individual working will depend upon the extent to which the task calls for co-operation and interaction among team members (Guzzo, 1986). If a construction project is divided into distinct areas of responsibility (e.g. floors), members of the management team may be able to work in legitimate isolation for much of the time.

The difficulty in attributing project performance to team climate does not mean that team working is an overrated or necessarily ineffective form of work organisation design. Rather it suggests that team climates, and team processes in particular, are highly complex phenomena not easily reducible to a set of four or five discrete factors. That task orientation has a reasonable connection with productivity levels and, similarly, that shared vision moderates the impact of project complexity supports the argument that team processes must be both shaped and allowed to evolve to suit the nuances and demands of the project task. Projects and their clients are, by their nature, unique; it would be unreasonable, therefore, to suggest that one set of team performance processes - one climate - is appropriate to the solution of every project.

6.3.4. Practical Issues

The complexity of a product can be measured by its relative position on two dimensions: the complexity of its internal structure (e.g. the number of distinct components and production steps, number of interfaces, technical sophistication), and the complexity of the user interface (number and specificity of performance criteria, etc.) (Clark and Fujimoto, 1992: 8-14). Clark and Fujimoto locate the automobile, which is the subject of their inquiry, in the upper right quadrant of the resulting matrix, indicating high internal product complexity and high product-user interface complexity. Construction projects can be located in the same quadrant; buildings are technically complex and customer needs are usually multi-faceted and sometimes contradictory and unpredictable. But not all construction projects are equally complex. The client questionnaire survey revealed that perceptions of the relative complexity of their projects were subject to considerable diversity. On a 40-point scale, measures ranged from 20 to 32 with a significant number of projects at both ends of the distribution. More complex projects were characterised by novel technical solutions, controversial intentions, many outside links (with tenants, trade contractors, etc.) and a rapid pace. Examples included a new airport terminal

construction, a social housing project, a Nicholas Grimshaw signature building and a theme park. Less complex projects included a car park construction, a green-field commercial building and the fit-out of a new store in a shopping centre.

The results of the quantitative analysis did not show that complexity was related to the size (value) of the project, nor to its duration. However, because there is some evidence that team climate - and particularly shared vision - has a moderating effect on project complexity, and also significant evidence that team climate is predictive of innovation in management teams (Anderson and West, 1994), a work organisation design which creates a common set of goals that all team members are striving to achieve is a sensible strategy for complex projects.

Finally, Tjosvold (1991: 136-137) suggests five practical ways that a team leader can create a shared vision among the members of her project team:

1. Explore the team's vision, so that all team members know the team's purpose and that it can only be achieved by working together.
2. Analyse critical success factors to achieve the vision, by prioritising the critical tasks and assigning responsibility for accomplishing them to individual team members.
3. Assign a task and ask for one product from team members, so that everyone contributes to and supports the team's output, whether this is a set or proposals, a new product or the solution to a problem.
4. Keep track of group productivity, by averaging individual outputs to arrive at a group average. This will allow team member's to monitor their own performance and to help others improve theirs.
5. Promote group learning, by encouraging and supporting team members to develop their skills.

6.4. Team Climate, Team Member Internal Work Motivation and Job Satisfaction and Project Performance

Because of the association between these three dimensions, the relationship between team member internal work motivation and satisfaction and project performance will be discussed in this section rather than separately.

6.4.1. Summary

Team member internal work motivation revealed small to moderate Pearson correlations with support for innovation ($r = .30$; $p < .05$) and shared vision ($r = .20$) and was significant at the one per cent level with task orientation ($r = .44$). The stepwise procedure, however, did not indicate that any team climate variable was predictive of internal work motivation. Reasonably significant Pearson correlations were found between job satisfaction and participative safety ($r = .37$; $p < .05$), support for innovation ($r = .31$; $p < .05$) and vision ($r = .36$; $p < .05$). Again, however, stepwise regression did not suggest that any of the climate variables were predictive of job satisfaction.

Motivation did not correlate with any of the performance measures, and this was also the case between job satisfaction and customer satisfaction and project income. A small negative Pearson correlation was found between customer satisfaction and productivity, however ($r = -.14$), although the multiple regression procedure did not suggest that this was causal in either direction.

6.4.2. Theoretical issues

The notion that a contented worker is a productive worker has proved a holy grail for researchers since Hawthorne. Some more recent studies (e.g. Rodgers and Hunter,

1992; 1993) support earlier findings (Porter and Lawler, 1968) that job satisfaction gains may be a result, not a cause of increased productivity. The quantitative results of this study provide no substantive evidence that job satisfaction has any effect on levels of customer satisfaction or project income in the population of project teams. However, there is some evidence that job satisfaction may fall as productivity increases. This was perhaps expected since the productivity measure was based on man-hours expended per £'000 of the project's value. The size of project teams in Conorg has been reduced by as much as 100 per cent since 1990 and this has resulted in significant productivity gains. This has not led to appreciably lower levels of job satisfaction, however, and may be indicative of considerable over-capacity in construction project teams prior to 1990 or the unintentional enrichment of some work as more tasks are combined in a single role. But flexible and leaner resourcing is an increasing HR priority for construction project organisations as lowest cost continues to be an important driver of client procurement decisions. At present it seems that job satisfaction is not significantly diminished as a result of more intensive patterns of work. However, further research is required to determine whether or not the identification of a negative relationship between job satisfaction and performance is an emerging trend in the 1990s.

Human Resource Management is distinguished from earlier models of Personnel Management by its emphasis on strategy (Hendry and Pettigrew, 1990) and the role that improvements in the management and development of people can play in securing competitive advantage (Hendry and Pettigrew, 1986; Rainbird, 1994). By contrast, references in the literature to the pursuit of employee job satisfaction as an HRM policy goal are rare. Guest's (1987) model is typical. Although he states that "organisational commitment, combined with job-related behavioural commitment will result in high employee satisfaction, high performance, longer tenure and a willingness to accept change" (Guest, 1987: 514), job satisfaction is not included as either an HR or an organisational outcome in his policy framework. We can infer

from this that HRM places more importance on the performance of the organisation than on the satisfaction of the individual. If job satisfaction and organisational performance are negatively correlated, as the results of this research seem to suggest, this may be a dilemma for HRM.

6.4.3. Empirical Issues

The measure of job satisfaction used in the survey was intended to elicit the extent to which an individual expresses a positive affective orientation to his or her job. This is a prospective matching model of job satisfaction which links individual attitudes with the characteristics of the work itself (Hackman and Oldham, 1980). Social desirability is also a measure of job satisfaction but is more closely aligned with the social information processing approach. This suggests that individuals' affective satisfaction responses are a function of social interaction. Thus team member satisfaction is predicated on, for example, the quality and harmony of interpersonal relationships. The results of the data analysis show that the matching and social information processing constructs are related, although not causally. How the individual team member perceives his or her work is therefore influenced by certain aspects of group consensus. If, as Anderson and West (1994) suggest, social desirability is dysfunctional, this may be further evidence that the pursuit of job satisfaction is not compatible with the stated organisational goals of HRM such as high productivity and cost-effectiveness (Guest, 1987).

Although not particularly significant, the small negative causal connection between job satisfaction and task orientation should be mentioned. This aspect of team climate involves the team questioning existing task performance strategies which may be uncomfortable for some team members. Questioning colleagues' approaches to the task, and thereby initiating change in the status quo, may be incongruent with group cohesiveness, consensus and harmony.

Before concluding this section it is important to recognise that there are methodological problems in measuring job satisfaction using questionnaires. Although the sample size was large enough for us to assume that response bias was distributed randomly, the recent trauma of severe industry recession coupled with organisational down-sizing has created an atmosphere of job insecurity which may have increased the size of discrepancy between the true degree of job satisfaction and the obtained measure.

6.4.4. Practical Issues

The intensification of work appears to be a characteristic of employment in the new industrial competition. The analysis of the relationship between job satisfaction and productivity suggests that increased productivity *may* be achieved at the expense of the individual team member's satisfaction with their work. This is in contrast to the dominant approach in the literature which states that job satisfaction is either an antecedent of productivity or vice-versa (Rodgers and Hunter, 1992); in other words, that workers are satisfied because they are productive or productive because they are satisfied. If it was the case that job satisfaction predicted productivity this might be sufficient motive for organisations to focus on creating conditions which improved individuals' satisfaction. But if the two outcomes are unrelated or, worse still, negatively related, then there is little incentive for organisations to engage in positive action.

Guest (1996) emphasises the importance of internal 'fit' between HR practices and organisational performance in his normative model: "this normative perspective argues that specific practices designed to achieve specific HRM goals will, if they can be implemented, always result in superior performance" (1996: 5). He argues that, despite claims to the contrary, the HRM literature has not empirically tested the

relationship between HRM and performance, although this is starting to be addressed in the US (e.g. Arthur's (1994) study of mini steel mills). Guest distinguishes between performance and other organisational outcomes such as job satisfaction and commitment and implies that performance takes priority. Thus, "there is some indication that highly successful companies may not be those in which people prefer to work" (Guest, 1996: 6). This supports his earlier 'black hole' model of no industrial relations and no HRM (Guest, 1995).

The centrality of performance reflects the emerging primacy of product over process. Both the Quality and Process Re-engineering movements emphasise product performance. In 1987 Kodak pioneered concurrent engineering which replaced sequential and parallel product development. This allowed Kodak to cut in half the time to move its 35mm, single-use camera from concept to production. We would expect that certain HRM practices were important in facilitating the transition to the new production culture - perhaps team member selection and job design - but it is highly unlikely that job satisfaction or other similar organisational outcomes were a driving concern for the designers.

6.5. Enabling (Design) Factors (Leader Practices, Team Organisation and Team Performance Orientation) and Team Climate

6.5.1. Summary

The taxonomy of project team performance proposes that three primary enabling factors can be manipulated to facilitate the creation of conditions that support high levels of team performance: transformational leader practices, team organisation and team performance orientation. Bi-variate correlations revealed significant relationships between the cluster of leader practices and team climate and between the team organisation variables and team climate. Multiple linear regression

confirmed that many of the relationships between the variables were causal. For example, between team performance orientation and the modelling leader practice and vision, between group norms and task orientation, and between group norms and composition and social desirability. Stepwise regression analysis also isolated causal relationships between the enabling leader practice and participative safety, between group norms and support for innovation and between the challenging leader practice and task orientation.

6.5.2. Theoretical Issues

Our earlier discussion of the finding that there is a weak relationship between team climate, or team processes, and the three measures of team performance might lead us to question the need to spend time looking at the factors that can create a healthy team climate. There is some convincing evidence that the pursuit of effective team working as an end in itself may be a *non sequitur*. Having said this, we should be aware of two caveats. First of all, team climate has been shown elsewhere to be predictive of innovation in management teams (Anderson and West, 1992, 1994; West and Anderson, 1994) which is an important performance outcome in organisations generally and project management specifically. And secondly, the evidence is drawn from a single case study where the industry approach to project management is overwhelmingly task-oriented. The experience of project teams engaged in different activities in other industries (such as consultancy assignments, for example) may be very different. Moreover, the results do indicate linkages between team climate and high productivity and moderated (perceived) project complexity and are indicative of the complex inter-play between group processes, individual attitudes and organisational outcomes.

We cannot escape from the fact that team climate is not predictive of customer satisfaction which has emerged as one of the most prized performance outcomes in

contemporary organisations. However, team climate's link with innovativeness and the ability to deal with change is relevant to the management of complex projects. Within Conorg, for example, we have seen the frequency with which team leaders report that the management of highly complex boundary relationships with other teams involved in the development process can both positively and adversely affect the project's overall performance. It is suggested that one reason for the difficulty in managing this situation is an inherent reluctance to experiment with alternative performance strategies. The organisation's strong cultural leaning towards task orientation prevents it from adopting a more flexible approach to learning and problem solving.

In addition, the four factors - support for innovation, shared vision, participative safety and task orientation - may be more relevant in different project contexts, or at different times in the project life-cycle. For example, a participation strategy which increases individual influence over decisions may be favoured where the project manager is seeking to devolve more responsibility to team members. Creating a shared vision may be more important to the project manager if the project objectives or performance criteria are uncertain and - as we have seen - this is likely to be the case where the project is highly complex. Alternatively, task orientation may be relevant if the team has a clear understanding of what it is trying to achieve and the development process is relatively straightforward. And finally, team leaders might emphasise support for innovation where there is sufficient time to conceptualise, develop and implement improvements in working practices and processes.

At this point, theory meets practice. Ideally, all of these norms, and perhaps some others that have not been identified, would be simultaneously - or at least sequentially - present within a project team. But because project teams are temporary and expedient, it is improbable that sufficient time or resources are available to create these perfect climatic conditions. A more realistic and pragmatic alternative would

be for the team leader to identify and articulate the key performance criteria and the associated behaviours that are apposite to the effective execution of the task. When this has been done the team leader can work to ensure that the relevant regulative norms or standards of behaviour are quickly established and understood. These norms will subsequently guide how the team functions and its key internal processes.

While team climate theory constitutes an important advance in our understanding of the ways that successful and unsuccessful teams work, it is apparent that influences on team performance are complex and not easily reduced to a few generic factors. Teams and their members can behave in many different ways and yet still achieve high or low levels of performance. Katz and Kahn (1978) refer to this phenomenon as *equifinality*. This means that teams can reach the same outcome from various starting points and using a variety of different means - even teams with the same task. Hackman (1990) argues that because teams can redefine the same reality in different ways more emphasis should be placed on the "creation of conditions that support effective team performance".

"Rather than attempting to manage group behaviour in real time, leaders might better spend their energies creating contexts that increase the likelihood (but cannot guarantee) that teams will prosper - taking care to leave ample room for groups to develop their own unique behavioural styles and performance strategies" (Hackman, 1990: 9).

Team climate captures many of the norms, attitudes and behaviours that we would expect to find in high performing teams. But the research evidence from this study suggests that other, so far unidentified, factors are at least as influential as participation, support for innovation, task orientation and shared vision in providing the antecedents to high project team performance.

6.5.3. Empirical Issues

This section will examine the principal relationships between the enabling or design factors and team climate factors. The three principal team design constructs - team organisation, leader practices and team performance orientation - will be discussed in that order.

6.5.3.1. Team Organisation and Team Climate

In terms of the effect of team organisation on team climate, there are strong and significant linear relationships between group norms (predictor) and task orientation (criterion) and moderate to strong linear relationships between group norms and support for innovation. This is not unexpected. Standards of behaviour dictate patterns of working and interaction. Within Conorg, for example, task orientation has been described as a primary cultural influence on human action and this is supported by the strength of its relationship with group norms ($p < .00$). The existing research on temporary groups has not sufficiently explored the way in which the parent organisation's cultural recipe acts upon and shapes behaviour and action in project teams. Partly, this has been a consequence of the enduring influence of Tuckman and Jensen's (1977) five stages of group development which compresses group development into a series of sequential stages. Their third stage - norming - involves members of the group agreeing work rules, role allocation and standards of conduct. But while project teams may develop their own unique operating styles which meet the demands of the task over time, they are still bound to the parent organisation through, for example, company-wide reporting systems which transcend the temporary nature of specific project situations. Equally, because team members share similar past scripts (Bettenhausen and Murnighan, 1985) there is a tendency for a particular style of problem-solving behaviour to be reproduced on different projects

(Bate, 1992). In Conorg, it is argued that these scripts are associated with the organisation's long-standing relationship with clients in the retail sector. For obvious reasons, these clients value being able to open their stores as quickly as possible. This concern with speed and on-time completion is a feature of the organisation's approach to the execution of projects in other sectors. Because the norm setting process is generally not managed, teams tend to adopt a task-oriented approach even when the management of complexity or of quality is a more important issue than the speed of the project's completion.

Manipulating the composition of groups is one way - often the only way - that organisations intervene in the team design process. Many organisations use instruments such as the Team Management Wheel (Margerison and McCann, 1985), the Belbin Team Role Self-Perception Inventory (Belbin, 1982; 1993) or the Test Agency's 'Insight' Inventory to help build the 'ideal' team (Hurst et al, 1989: 95). These instruments consider the heterogeneity of the team's membership and the relationship between individual traits and their combined effect on group performance. Typical of many project management organisations, Conorg concentrates on the selection of team members with the mix of technical skills considered to be required to successfully execute the project. Industry groups such as the Construction Industry Council have supported this approach by sponsoring research projects to define the skills and knowledge required by project managers within the context of, for example, National Vocational Qualifications and adopts a similar functional approach to that of the Management Charter Initiative. The measure used in the survey was designed to elicit members' perception of their team's skill and knowledge capability in general terms and cannot claim sensitivity to composition factors such as role balance. This may explain why the measure was highly predictive of social desirability ($p < .00$), but not the four principal dimensions of team climate. However, this approach is consistent with the *a priori* theory which is critical of team selection based on personality factors (Katzenbach and Smith,

1993; Hackman, 1992), and the inductive, *a posteriori* conclusion that team design should use a valued performance outcome as its referent point rather than team processes.

Team size is a dimension of group composition, but one that we are able to measure objectively. Team size was strongly correlated with the size of a project as measured by its value ($r = .71, p < .01$); the larger the project, the bigger the team needed to manage it, and the greater the level of fee income. Because large projects also take longer to complete, there was also a significant correlation between team size and project duration. But the larger teams were also associated with significantly lower levels of participation ($r = -.41; p < .05$) and social desirability ($r = -.33; p < .05$). Support for innovation, task orientation and shared vision were also negatively correlated, although more moderately. This presents a paradox. Although there is no evidence that larger projects are necessarily perceived to be more complex than smaller projects, where a large project is unusually complex, the team's ability to deal with that complexity may be undermined by its need for a larger membership. The team leader must therefore pay close attention to the organisation of the project, perhaps by forming smaller sub-teams responsible for a whole and meaningful piece of the work. Here, though, care must be taken to effectively manage the interfaces between the teams and the consolidation of their separate activities into the project development process as a whole.

The task structure variable occupied a pivotal position in the research taxonomy (a) because early in the improvement programme Conorg had identified task fragmentation as inimical to project team effectiveness and (b) because of the popular hypothesis that the higher the motivating potential of a job, the higher should be the motivation and performance of the job holder (Hackman and Oldham, 1980: 87). Four of Hackman and Oldham's core job characteristics were retained in the task structure variable following factor analysis (skill variety, task identity, task

significance and autonomy). We might have expected that there would be a relationship between task structure and shared vision given the presence of the task significance component in the task structure factor. There are parallels between task significance, which is defined as the degree to which the job has a substantial impact on the lives of other people (Hackman and Oldham, 1980: 79), and shared vision, which includes "a sense of a valued outcome towards which team members strive in their creative efforts" (Anderson and West, 1994: 7). The extent to which team members experience work meaningfulness is enhanced when they believe that their work will have a substantial impact on the physical or psychological well-being of other people. Because all construction projects impact on the lives of other people in some way we might expect that all work would be intrinsically motivating, but this is not the case. Team members derive different levels of significance and meaning when involved in the construction of a supermarket in a privileged community compared with the construction of social housing in an inner-city area.

Hackman and Oldham's job characteristics model and similar research which supported the job enrichment crusades of the seventies in companies like AT&T (Ford, 1973) and Volvo assume that there is a causal link between job enrichment, internal work motivation and work performance (Brousseau, 1979). The results of this study do not support this assumption. Jewell (1985) argues that this is because job enrichment instruments do not measure the actual richness of the job, only the extent to which the job is perceived to possess these characteristics by the respondent (Jewell, 1985: 203). Individual characteristics such as age and background can affect perceptions of job enrichment. The data analysis, in fact, produced a bi-variate correlation between task structure and age which was significant at the five per cent level ($r = .32$). There was also a small negative bi-variate correlation between tenure and task structure ($r = -.13$) supporting Aldag and Brief's (1979) finding that perceptions of enriched work decline with time spent on the job.

Although the operational definition for the task structure variable does not encapsulate the division of labour design principles that are present in the fragmented professional labour process in the construction industry, it is not perhaps surprising that there was no relationship with any aspect of team climate. Although we have elsewhere questioned the generic relevance of team working to the organisation of work, where support for innovation or shared vision is necessary to achieve a valued performance outcome it is unlikely to be achieved through the design of the work itself.

Of all the team organisation factors, *tenure* is perhaps the most relevant to the actual work experience of team members. Projects have a finite life-cycle which can range from a few months to several years. Earlier research (e.g. Katz and Allen, 1982) concluded that team performance declines after reaching a peak at about 3 years. The majority of construction projects are completed in this time period. Towards the end of the project, some team members are moved on to new projects. A core team is usually left to handover the project to the client. On occasion, a whole team moves onto a new project, but this tends to be in the fortuitous and timely event of a client procuring a new project which is similar in size and/or type to the one just completed.

The results indicate that there are no significant linear relationships between tenure and any of the team climate variables. However, there were small to moderate relationships between tenure and social desirability ($r = .26$) and task orientation ($r = .21$). We might expect social desirability to increase with time spent in the team. As the team settles, team members grow to know each other at a social as well as a task level and relationships are formed. The link with task orientation is more interesting because it provides some preliminary evidence to upset traditional wisdom that 'group-think' is a product of the comfort factor that is associated with long tenure. To recap, task orientation is characterised by reflexivity, constructive controversy, tolerance of minorities and commitment to excellence (Anderson and West, 1994: 8).

Constructive controversy "promotes elaboration of views, the search for new information and ideas, and the integration of apparently opposing positions" (Tjosvold, 1991: 172). The longer that team members are together, the more open they become to state their positions and ideas and the logic that underpins them.

6.5.3.2. Leadership Practices and Team Climate

The model of leadership operationalised in the questionnaire items is related to theories of transformational leadership (Burns, 1978; Bass, 1985). This approach suggests that the team leader who challenges the status quo, generates a mobilising vision, builds co-operative and motivated teams, leads by example and recognises individual contributions will be more effective than either a laissez-faire leader or a leader who tries to manage by coercive transactions with team members (Bass and Avolio, 1994). It was hypothesised that transformational leadership was particularly apposite to project management because of the context of continuous change and the need for team-generated learning and innovation. Moreover, since the essence of transformational leadership is the ability to get things done through people - either as individuals or working together - it was anticipated that there would be a strong causal connection between leadership practices and team climate. This expectation was based on the idea that team climate is, potentially, a managed formation, influenced by both positive and negative inputs from the team leader and the parent organisation.

The results showed significant bi-variate correlations between most of the leadership and team climate variables. Following the stepwise regression procedure, significant linear relationships were also found between the modelling leader practice and shared vision, between the encouraging leader practice and shared vision, between the enabling leader practice and participative safety, between the challenging leader practice and task orientation, and between the inspiring leader practice and social

desirability. These results were not as predicted. We might have expected, for example, that the *inspiring a shared* vision leadership practice would account for a significant proportion of the variance in shared vision, that the challenging the process leader practice would be predictive of support for innovation, and also that the encouraging leader practice would be an antecedent of social desirability. The reason why this was not the case may lie partly in the operational definition of the variables by the test developers. For example, the challenging questionnaire items emphasise the practice of questioning existing work practices whereas the support for innovation items focus on team members providing practical support for the development of new ideas and their application. This may be perceived to be a weakness of the Leadership Practices Inventory. Whilst the enabling leader practice does go some way to address this issue because it focuses on team building, it is also largely operationalised using non outcome-related behaviours. It might be useful, therefore, to promote support for innovation to the level of leader practice as well as an aspect of the team's climate, although this obviously requires further research and exploration. As a leadership behaviour, support for innovation connects the pursuit of change to the physical act of changing.

The relationship between inspiring a shared vision and the existence within the team of shared objectives also requires clarification. The shared objectives described by Anderson and West (1994) are hard and tangible, whereas the envisioning leader practice is far more esoteric, appealing to individual hopes and dreams. This might help to explain the significant linear relationship between this leader practice and social desirability. Anderson and West (1994) are precise in their definition of team vision: "This is not some empty mission statement containing the rhetoric of senior management and hiding a lack of support and provision of resources to obtain objectives" (1994: 6). Yet the two variables are not necessarily dichotomous. Leaders must be clear in their own mind where they are going and what they hope to achieve; a strong personal commitment to some preferred future can create a common

identity among team members without unnecessarily preventing their freedom to adapt to changing circumstances. But there is also a need for team members to know where they are heading in the short-term. This need is exacerbated in the construction project environment where even a small misunderstanding among team members can have major repercussions in the project development process. So, again, it is not enough that the leader has a vision. The vision must be converted into agreed performance objectives which are clear, shared, challenging and realistic.

The absence of a causal relationship between encouraging leader practices and social desirability may be evidence that recognition of individual and team accomplishments does not increase team members' positive disposition to their work environment. Historically, the 'macho' culture which dominates relationships in the construction industry has not been easily reconcilable with 'softer' practices like encouraging the heart. One project manager, for example, stated that "the team is enjoying the job but [because of time pressures] are being kicked by me to get things done... I have caressed and bullied them... I adopt the same ruthless manner with everyone and they respect me for it". This leadership style is not uncommon and exists in various shades throughout Conorg. It is reminiscent of Blake and Mouton's (1962) '9,1' pattern of leader behaviour which focuses overwhelmingly on production and task management. Its popularity in construction is most likely a result of both the primacy of on-time project completion and the contractual and adversarial nature of relationships between different parties in the sector.

This may help to explain the predictive power of encouraging leader practices on support for innovation. We might suggest that an environment in which team leaders make decisions and team members carry them out, and where there is little encouragement or recognition, will lead to the suppression of creativity. However, where the team leader demonstrates a high concern for people by recognising individual contributions and publicly celebrating accomplishments, this will

encourage team members to express their creativity and to explore opportunities for continuous improvement in their work.

Whether or not the team perceives itself to have a shared vision is strongly related to the example set by the team leader. The team leader's actions and behaviours provide a focus for the team's task objectives and work activities. Team members will be more inclined to share the project vision if the team leader clearly demonstrates her active and consistent commitment to it. This provides further evidence that traditional approaches to team development such as the verbalisation of a project mission statement have less impact on the formation of a healthy team climate than the day-to-day behaviour of the team leader.

The fifth leader practice, enabling others to act, was strongly predictive of team members willingness to participate in team processes. Kouzes and Posner (1993) suggest that "to create extraordinary things in an organisation" (1993: 5) team leaders must create partnerships with and between their team members and that this "begins with creating co-operative goals and sustaining trusting relationships" (ibid). For Anderson and West (1994) a critical precursor to participation in creative and innovative process is a climate of psychological safety (1994: 8). Trust and psychological safety are obviously related phenomena. Participation is probably the concept most widely identified with team working and is associated with the myriad, if haphazard, uneven and piecemeal (Marchington, 1994: 302), experiments with employee involvement. We have already discussed the limitations of the operational definition of participative safety used in this project and elsewhere and its failure to predict team performance or to moderate project complexity. Again, we can justifiably question the appropriateness of participative safety as a best-practice prescription of team member interaction and working in a project team environment. Relationships inside and across the team's boundary are important to team performance, as revealed by the interview results. Participation may also be justified

on ethical grounds but how consistent is it with 'hard' normative models of HRM? Given harsh economic realities, if participation does not improve the firm's competitiveness it is unlikely to endure. But this view is dangerous. Social/interpersonal relationships are critical to team and organisational performance and there is a genuine need for more empirical research into the nature of these relationships and where and how they result in high performance outcomes (Arnold et al, 1995: 371).

6.5.3.3. Team Performance Orientation and Team Climate

Bi-variate correlations between team performance orientation and shared vision ($r = .50$) and task orientation ($r = .40$) were significant at the one per cent level, and evidence of causality was found for both variables following the regression procedure. The construction of the team performance orientation variable was derived from an *a priori* theory that a parent organisation's HRM policies and practices will have a direct effect on team climate. The three performance 'orienting' levers which are pertinent to the project team environment are (1) rewards and how well they reinforce desired team behaviours, (2) the availability of training to develop individual strengths and help team members work together effectively, and (3) the extent to which team members perceive themselves to be equal in status, thereby preventing the debilitating effects identified by Messé et al (1992). However, factor analysis removed the status dimension and substituted the following item: "Lots of people let us know what they think of our performance as a team". This item relates to performance feedback and is consistent with the orientation variable since feedback, training ("Training is available to help us work well as a team"; "We have been trained to use our strengths to the benefit of the team") and rewards ("The reward system creates a strong incentive for effective team working") are all concerned with reinforcing team performance. Indeed, this item is closely aligned

with performance management, albeit performance management which focuses on team, rather than individual, performance.

Corporate HR policies and practices were largely absent from the interview accounts of the team leaders in their explanation of the determinants of project performance. Only one team leader referred to the influence of reward on the climate in his team: "my people are happy with the way things are - there is no great discontent other than the raw deal they got at the last salary review". Neither training nor positional status were identified as being influential by any of the interviewees. The impact of the parent organisation on the team was only mentioned in one other respect - organisational tenure - and, from two alternative perspectives. One project manager referred to the tendency of "long-term, died in the wool" staff to go stale, whereas a second said that "half [my] team are long term Bristol office staff and have tremendous commitment to Bristol and the project because it is their future".

Chapter seven will discuss in more detail the relationship between HR policies and project management and the need to manage and develop individuals, teams, and the organisation in different ways. Within Conorg, HR activities can be seen to focus on the three levels in different and not necessarily complementary ways. Performance Management, for example, was introduced as part of an on-going programme of cultural change, but the emphasis in both organisational communications and line-manager training was the development and setting of objectives for the individual, not the team. Rewards are similarly focused on individual, rather than team contributions, although there have been occasions where all team members have been recognised for an outstanding team performance, albeit in different ways. Equally, management training and development tends to concentrate on either individual or organisational needs. Seminars in commercial awareness, for example, are intended to encourage the organisation as a whole to become more profit-centred. Even training in team skills seldom involves intact teams.

The significant relationship between team performance orientation and the two dimensions of team climate provides prima facie evidence that, in a decentralised, multi-site, project-oriented organisation, corporate HR policies and activities *can be* an important enabling factor for team performance. However, the constituents of the performance orientation variable are such that HRM must focus on project team performance and should be channelled through the team leader. The team leader therefore becomes a conduit, drawing on resources available from the centre and applying them in a way which is appropriate to his unique project conditions (for example, 'just-in-time' specialist or technical skills training). If the project is highly complex, and since we have seen how shared vision can moderate perceived project complexity, it would seem that the team leader might adopt a design strategy which involves training in team working, the careful use of contingent rewards to reinforce team working, and a performance feedback system which integrates customer satisfaction measurement (for example) into the team's planning and performance strategies.

Certainly, more empirical research is required to examine the relationship between project management effectiveness and the battery of proceduralised HR activities and initiatives that are typically developed at the centre of the corporate organisation. This research study is perhaps more geared towards the devolved, or non-proceduralised, role of line (project) managers in leading and developing people to achieve competitive advantage. Purcell (1996) has questioned the use of "a singular 'it'" (1996: 1) and the 'bundles' approach to HR practices "which, taken together, are claimed to have a significant impact on firm performance" (1996: 2). He is uncomfortable with the best practice, normative models of, for example, Guest (1987; 1996) and is worried by the 'process connection' 'proven' to exist between the use of certain HR techniques and 'crude' output measures. His critique of the normative approach leads him to argue "that it is the appropriateness of the human resource

system to the production system that is key” (1996: 7). Here, we begin to see that the different levels within an organisation (corporate, team, individual) must be considered in this debate. How team leaders internalise and then operationalise corporate HR policies and systems seems to be instrumental in a project-oriented organisation’s ability to achieve internal fit between strategy and performance.

6.5.4. Practical Issues

Although the results of this study suggest that we should be critical of prescriptions for team working that are currently popular in management panaceas such as Business Process Re-engineering (BPR), Total Quality and Empowerment, it would seem that certain team behaviours and conditions are prerequisite to effective performance. Moreover, because projects are by their nature unique, it is likely that different project circumstances will require contingent team performance strategies and approaches to the task. At the same time, there are some norms and standards of behaviours that should be resident within all teams irrespective of their operating environment. For example, that individuals in the team should help each other when assistance is requested or that team members should always produce work of high quality. The role of the team leader in facilitating the establishment of purposeful norms is pivotal. She can use several complementary strategies including defining team member roles and acting as a personal example, demonstrating desired standards of behaviour through her actions. One approach is to use consensus decision making (Keleman, 1994) as part of a team development event early in the team’s life. Finally, throughout the team’s life she should continuously search out challenging opportunities for the team to change, grow, innovate and improve, by experimenting, taking risks and learning from the accompanying mistakes (Kouzes and Posner, 1987).

Two aspects of team organisation that are regularly discussed by senior management within Conorg are project team size and tenure of members. That smaller teams generate increased interaction and participation seems to be an accepted wisdom (Stott and Walker, 1995: 413) and the negative Pearson correlation between team size and participative safety ($r = -.41$; $p < .05$) in this study seems to confirm this. But the regression procedure did not indicate that neither team size nor tenure were predictive of any dimension of team climate. This may suggest that neither factor should be a particular consideration for team designers. However, this is where we identify an explicit conflict between designing for effective team processes and designing for effective team performance. Although a concern was expressed by a few project managers that long tenure could eventually lead to a decline in performance (e.g. "[After approximately four years together] everyone is now getting stale. Since about last October, people have been finding it difficult keeping the momentum going"), both the quantitative and qualitative results clearly identified a strong relationship between the length of time that team members had worked together and team performance.

6.6. Enabling (Design) Factors and Project Team Performance

6.6.1. Summary

Customer satisfaction has been proposed as *the* key measure of project team performance in this study and bi-variate correlations revealed that it is strongly related to the amount of time individuals have worked together in the team (i.e. tenure) ($r = .37$; $p < .05$) and to the inspiring leader practice ($r = .50$; $p < .01$). Moreover, the inspiring leader practice was strongly predictive of customer satisfaction (Beta = .42) at a two percent level of significance. None of the variation in customer satisfaction was explained by the four team climate factors, although there was a moderate, if non-significant, Pearson correlation with social desirability (r

= .30). Turning to productivity, group norms ($r = .32$) and task orientation ($r = .33$) both produced Pearson correlations with a five per cent level of significance. The stepwise regression procedure confirmed that task orientation was strongly predictive of productivity (Beta = .48) at the one percent level of significance. Two additional points of interest: (1) there was a small negative correlation between task structure and productivity ($r = -.24$), and (2) none of the leader practices were related to productivity ($r > .20$)

6.6.2. Theoretical Issues

The observed relationships between tenure and the inspiring leader practice and task orientation (predictor) and customer satisfaction and productivity (criterion) are powerful because the instruments used to measure these variables were independent of each other and not liable to the effects of common method variance. However, the results also raise some important issues. We have seen that leader practices are predictive of a positive team climate but that team climate is not necessarily an essential ingredient in the performance of project teams. Accepted wisdom supports the view that transformational leadership enhances the effectiveness of teams (e.g. Kouzes and Posner, 1987; Waldman, 1994; Atwater and Bass, 1994); leaders create conditions for their teams to realise their performance potential: leaders “bring people together to accomplish the extraordinary” (Kouzes and Posner, 1987). Generating a shared vision is essential to the success of a construction project which unites groups of specialists who have - often - contrasting world views and competing aims and objectives. Vision “is a powerful and vivid picture of a desired state of affairs that is widely shared and understood and which acts like a magnet to draw people to it” (Hastings, Bixby and Chaudhry-Lawton, 1994: 27). The power of vision is not in specifying the means by which the project will be executed, but in ‘enabling’ team members and other project participants by providing them with a purpose and a destination. At a seminar in London, Richard Hackman said that it is

comparable with saying: "this is the mountain that we are going to climb", but not specifying how we will cross every ford (Hackman, 1995). The vision mobilises and integrates the team and helps it to overcome underlying tensions such as rivalry, doubt, lack of trust and resistance. This provides the context and the framework within which the team can focus on the achievement of its task, whether working together or as individuals.

But we must still be careful with this idea that vision is everything. Some visions are more intrinsically powerful and magnetic than others. The vision of one Conorg client is symptomatic: "total commitment to creating a world class shopping centre that delights all parties involved"; but it was recognised early on that such a broad statement of intent must be broken down into practical actions - known to the team as 'factors'. Thus delivery requires striving for the best solution to every issue, using every available method to understand what will make the customer chose and remain to chose [the client] and to focus on these things well, and to be the best in every discipline. Vision must be followed by strategy, measurement, activities and contribution. The measurement of the strong relationship between customer satisfaction and the inspiring leader practice, for example, was not taken at the inception phase of the 49 projects; the cross-sectional research design visibly demonstrates the need for visionary leadership throughout the project life-cycle.

The positive relationship between task orientation and productivity seems to reinforce traditional approaches to the management of people in organisations. We saw in chapter two how productivity improvements have historically been associated with the struggle between management and workers over the former's attempt to both control time and intensify work in the labour process. Elger (1991), for example, uses the Percentage Utilisation of Labour Index to highlight 'a ceiling breaking rise' in the intensity of human exertion per hour by factory operatives between 1982-84. "This", he says, "may be taken as suggestive evidence of the intensification of

labour, either in the direct form of higher average effort or in the indirect form of tighter co-ordination and increased flexibility involving reduced rest or waiting time” (Elger, 1991: 57). Productivity gains in management performance was a specific objective of Conorg’s improvement initiative at the time of its launch in 1990: a 100% increase in productivity was to be achieved by 1995. Initially this was to be linked to a job redesign initiative but market pressures for cheaper project teams led to the improvement being achieved by the reduction in the size of teams. One project manager, for example, stated that “a £33 million project that I had managed six years ago had a team of 22. Today I am managing £50 million of complex structure and services with a team of fourteen”. The recent appearance of groups like the CIRIA-led Construction Productivity Network are further testimony of the importance assigned to productivity as a competitive driver for the UK construction industry as a whole.

‘Task orientation’ sounds as if it implies the intensification of work through increased management control and direction. Indeed, we noted earlier the small negative causal relationship between job satisfaction and task orientation. But the operational definition for this factor suggests something different from the pursuit of higher productivity through more intensive work: reflexivity, constructive controversy, tolerance of minorities and commitment to excellence. It is suggested that these norms or standards of behaviour are inconsistent with the existing construction project management work culture. Anderson and West (1994) note that “many teams in organisations argue that they are too overwhelmed by demands to take the time to reflect regularly upon their objectives, processes and strategies” (1994: 9). The evidence, however, suggests that doing so leads to greater productivity. And, working backwards, this requires a leadership style that is not coercive or controlling, but one that is challenging, entrepreneurial and encouraging. A summary of this process is presented in figure 6.1. overleaf.

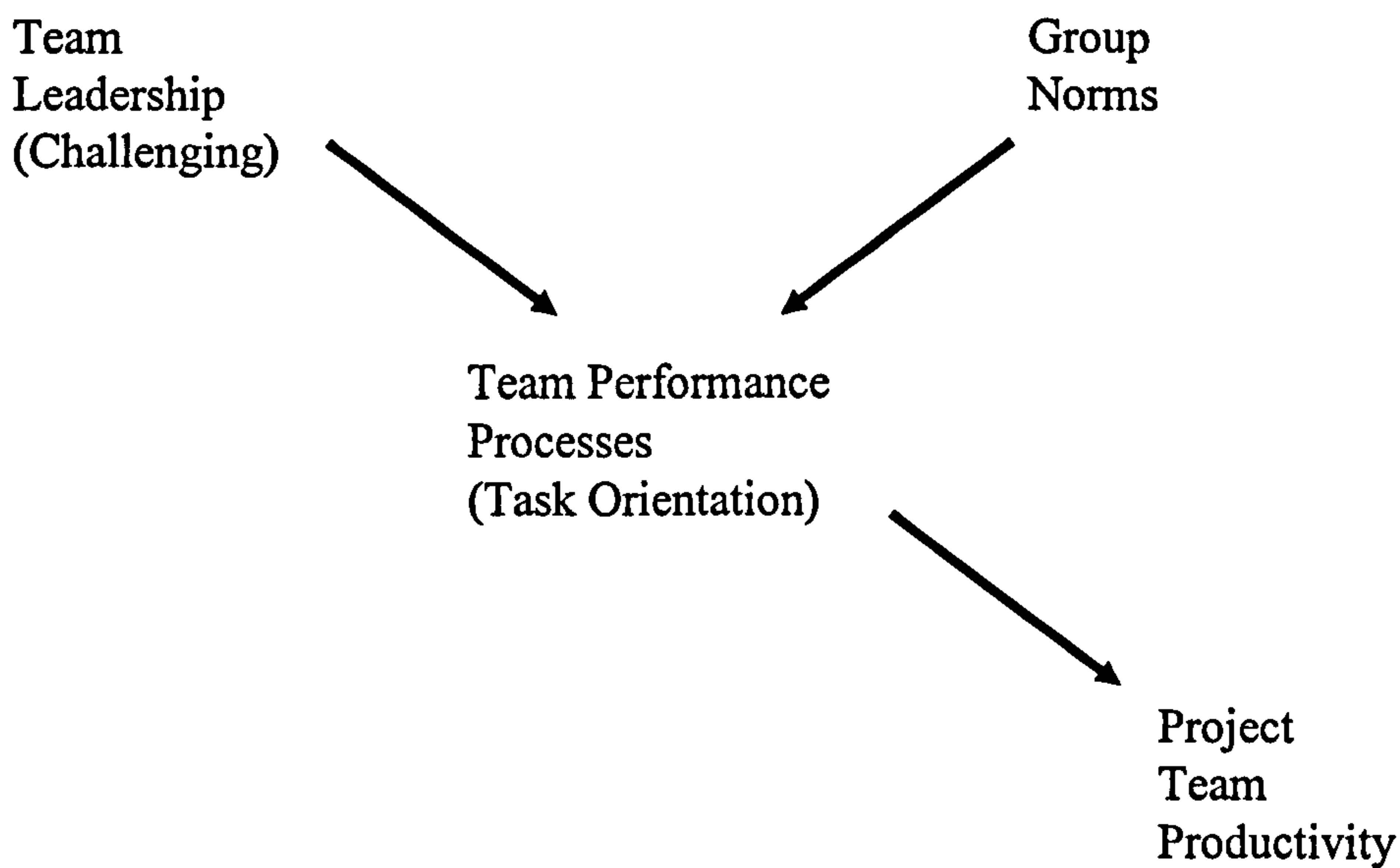


Figure 6.1: Determinants of Improved Productivity in a Project Team Environment.

6.6.3. Empirical Issues

The relationship between the enabling or design factors (inspiring leadership practices and tenure) and customer satisfaction provides further support for the argument that team design, not team process, is the most appropriate point of intervention for HR activities in a project team environment. Even the significance of the relationship between task orientation and productivity highlights the need to establish key group norms about how the team should work from the outset of the project. But we might wonder why some of the other design, or enabling, factors failed to predict the performance measures, notably customer satisfaction? One explanation for this may be that, in completing the customer satisfaction survey, the project sponsor was unconsciously evaluating the performance of the team leader, not the team as a whole. Following this logic, customer satisfaction would not necessarily be sensitive to a variable like group composition. Similarly, team performance orientation is addressed at the level of the group and comprises a series of interventions that focus on the team. In evaluating the team leader's performance, the customer satisfaction measure may filter out group influences on performance.

If, as would seem, there is an issue surrounding the efficacy of the performance measures it would make sense to reflect on this here. In chapter four the need to address the appropriate level of analysis in organisation research was discussed. An investigation of the performance of teams dictates that it is the team's performance that should be measured, not the performance of individual team members or the parent organisation. In chapter three we also stressed the need to move away from (or at least complement) traditional financial measures which do not readily detect the performances that lead to desired outcomes such as repeat orders or enhanced reputation. For example, if fees are used to measure performance it is probable that the project which secures a two percent fee in negotiation with the sponsor before work starts will earn more money *per capita* than the project with a one per cent fee. However, the sponsor's willingness to develop a longer term relationship with the project management firm will surely depend on what happens during the project. Customer satisfaction is therefore a more judicious measure of team performance.

But in project management, the project manager is the individual who most often interfaces with the project sponsor. She is the individual who attends the meetings, reports progress, and channels information back in to the team. The project sponsor will evaluate the performance of the team from what he sees (the progress of the construction) and what he hears. In operating on the boundary between the team and other participants and stakeholders in the project development process the team is represented by the project manager. Any attempt to gauge the customer's satisfaction with the team will inevitably be caught up in perceptions of the team leader. We can interpret this in one of three ways. Firstly, we can conclude that the team's task performance processes are relatively unimportant since customer satisfaction depends on the relationship that is formed with the team leader. Secondly, we can suggest that the team leader's relationship with the sponsor is dependent upon the team's task performance processes: if the team does not deliver, perceptions of the team leader's

performance will suffer. Or thirdly, we can take a different approach and suggest that the more that the team leader acts like a leader (in the sense of the transformational leadership style presented in this study), the more likely it is that she will have a positive effect on the people around her, be they team members or the project's sponsors. The results favour the first option but they may be misleading. The team is responsible for managing the execution of the project. The team leader, however, is the individual who creates the unifying framework within which the team and the other participants in the project work. The sponsor works closely with the team leader and develops a perception which is based on the team leader's ability to meld the team and achieve the project's objectives. The team delivers the project and the sponsor is satisfied. A representation of this is shown below in figure 6.2.

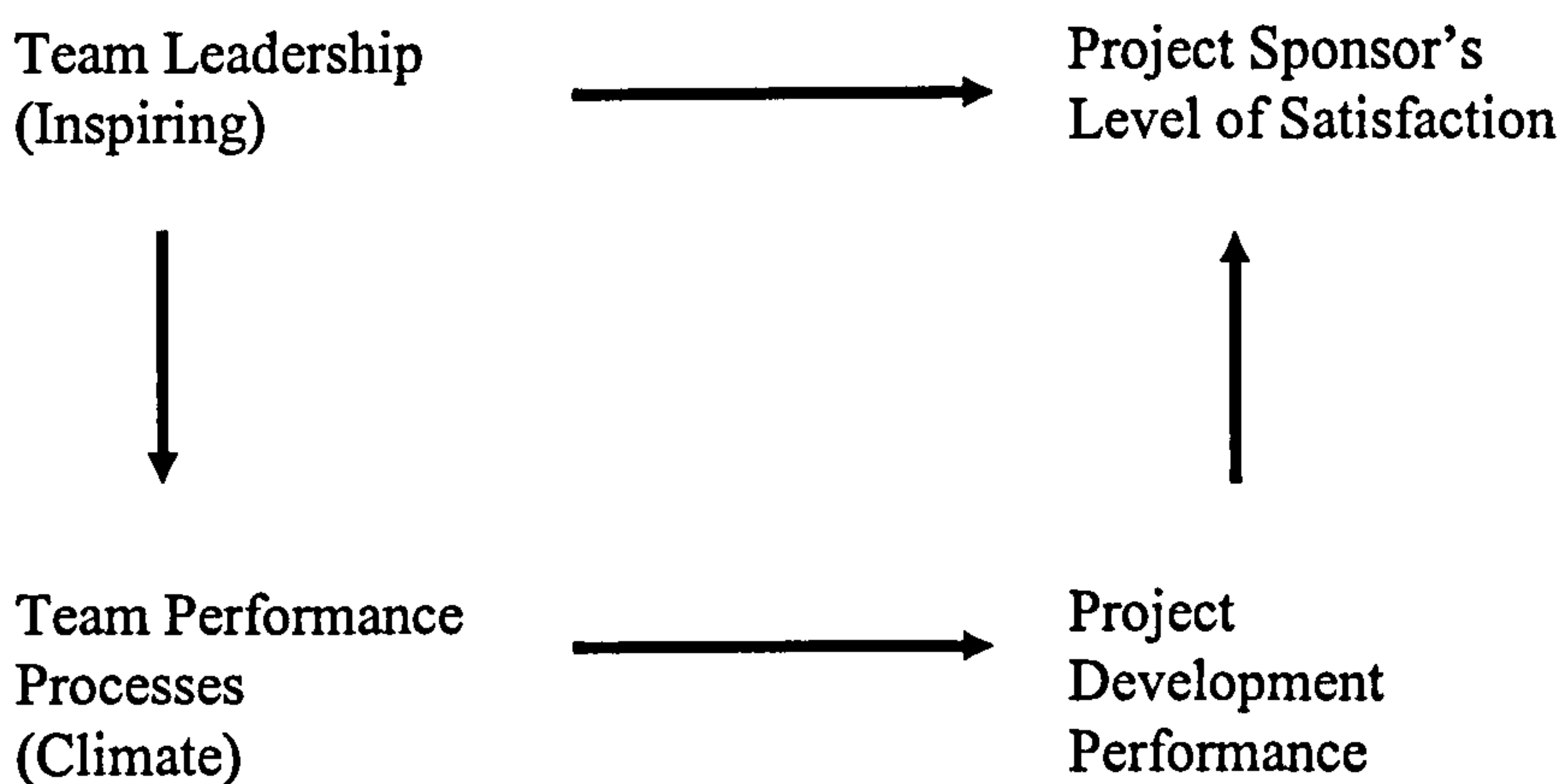


Figure 6.2: The Central Role of the Team Leader in Creating Conditions for Outstanding Project Team Performance.

Because in project management teams as they are currently constituted most power and authority is located within the figure of the project manager, and project communication and control systems are in some ways designed to distance team members from the project sponsor, it is difficult to create a measure of customer satisfaction with team performance which is disconnected from perceptions of team leader effectiveness. However, in the real world of concrete frames and marble cladding, it is reasonable to expect that the leader practices which produce satisfied

customers are the centre-piece of a complex web of relationships and processes which, via team and individual performances, ultimately delivers the quality of product expected by the sponsor.

6.6.4. Practical Issues

Creating the conditions which enable the team to develop performance strategies and processes that are appropriate to the specific needs of the project and its sponsor is a well-rehearsed theme in this chapter. This section has further developed the role of the team leader as the key enabler in the design of high performing project teams, both through the use of her influence over team members (inspiring, challenging, etc.), in the way that she organises the team and establishes performance norms, and by her ability to use corporate HR resources to orientate her team towards high performance. It remains to consider how the incidence of these special team leaders may be increased in organisations. One change management approach to this is considered in section 6.8. below.

6.7. Enabling (Design) Factors and Team Member Internal Work Motivation and Job Satisfaction

6.7.1. Summary

Individual satisfaction with the job correlated at the one per cent level with modelling leader practices ($r = .41$) and task structure ($r = .73$). Anticipated relationships with both encouraging and challenging leader practices were both small and not significant. There was a small negative correlation between team size and satisfaction indicating that the team members in the population prefer to work in smaller teams. The regression model showed that 57 per cent of the variation in individual job satisfaction was accounted for by variation in task structure and the

modelling leader practice. Internal work motivation correlated with three of the leader practices - inspiring ($r = .54$), challenging ($r = .57$) and encouraging ($r = .42$) - at the one per cent level, and also with team orientation ($r = .34$) at the five per cent level. Interestingly, motivation was not related to the task structure variable. The only causal relationship that emerged following the regression procedure was with challenging leader practices, but this was highly significant (Beta = $.57$; Sig. T = $.0000$).

6.7.2. Theoretical and Empirical Issues

The results confirmed existing theories about the determinants of motivation and satisfaction at work. In particular intrinsic job satisfaction was seen to be directly attributable to the characteristics of the job (Hackman and Oldham, 1976; 1980) and complements the findings of, for example, Loher et al's (1985) meta analytic reviews. Team performance orientation, too, was influential in predicting job satisfaction, being based in the notion that the parent organisation's HRM activities - especially those which reinforce effective team working through policies on rewards and training - would be influential. Although we have elsewhere noted that the absence of a significant relationship between shared objectives (vision) and motivation casts some doubt on the application of goal-setting theory (e.g. Latham and Locke, 1991) in a team environment, it is apparent that team members will be motivated by leader behaviours that provide a challenging environment in which to work. Arnold et al (1995) refer to a study by Mento, Locke and Klein (1992) which showed that "most people perceive trying for difficult goals as more likely to bring benefits such as a sense of achievement, skill development and material rewards (instrumentality) than trying for easy goals" (Arnold et al, 1995: 224).

6.7.3. Practical Issues

Job satisfaction has not been high on the HR agenda in the construction industry. To some extent this may be a consequence of the industry's innate tendency to view its work activities as intrinsically satisfying and the perseverance of the myth that people are 'born to work in the construction industry'. This is no longer true, if it ever was. Conorg has seen a small, but significant number of its young graduates leave the industry for careers in professions as diverse as accountancy and the police, despite having pursued four year degree courses in construction-related subjects. Although the determinants of organisational commitment are complex and outside the scope of this study, it is likely that positive experiences of HR policies and relations with peers and managers are contributory factors in decisions to stay or leave (Mabey and Garden, 1994). The identified effects of leadership practices, team performance orientation and task structure on job satisfaction is helpful because it highlights areas where leverage can be applied. Again, however, the role of the team leader in a decentralised, team-based organisation is pivotal. Not only is he the gate-keeper between the parent organisation and the team, deciding by how much or how little her team will be exposed to HR activities such as Performance Management and training and development. But she is also able to influence the individual's affective orientation to his work in the way that she establishes norms and roles, in the way that she organises the team's task, and in the way that she chooses between alternative leadership behaviours.

6.8. Self and Subordinate Ratings Of Enabling (Design) Factors, Team Climate and Individual Job Satisfaction and Internal Work Motivation

6.8.1. Summary

Significant differences were found in the perception of team leaders and team members concerning the presence of the different factors. Team leaders rated all of the dimensions of leadership style and of team climate far more positively than did their team members ($p < .00$). The only items where there was a reasonable level of agreement between team leaders and team members were group composition, task structure, team orientation, job satisfaction and internal work motivation.

6.8.2. Theoretical and Empirical Issues

As the incidence of upward rating and 360° performance appraisal continues to grow, the number of studies examining the causes of agreement between subordinate ratings of supervisor and supervisor ratings of self on motivation and performance items is increasing (London, Wohlers and Gallagher, 1990; Wohlers, Hall and London, 1993). To date, the predominant direction of the research has been in identifying the organisational or demographic variables that explain self/subordinate agreement (London and Wohlers, 1991). Wohlers, Hall and London (1993) argue that self-rating biases are attributable to halo and leniency effects and that subordinate ratings are less prone to this (1993: 264). Their study of 54 work groups revealed that (1) the gender of the supervisor and subordinate did not influence agreement, (2) same race dyads of supervisor and subordinate showed higher agreement levels than different race dyads, (3) difference scores were higher for managers over 55 years, and (4) agreement was more likely when subordinates participate with their managers in planning their careers (Wohlers, Hall and London, 1993: 272).

The importance of the self/subordinate rating process in this study is the possible impact that it can have on changing subsequent leader behaviour (Hegarty, 1974). It has been shown how the non-proceduralised behaviour of team leaders has a significant effect on customer satisfaction, team climate and team member internal work motivation and job satisfaction in the population of construction project teams. It has also been suggested that the existing project leadership style is primarily transactional and that this has its roots in the contractual, adversarial, time-bound and 'task-oriented' (traditional definition) nature of the construction industry in the UK. Although HRM policies and procedures such as rewards, training, selection, performance management and work design can and should be employed to facilitate the transition to high performance work systems, it is unlikely that team leaders will make the required changes to their behavioural styles and practices until they see themselves in relation to how their subordinates and customers see them (and perhaps not even then). The results show how team leader and team member agreement is closer in respect of factors over which the team leader has, or chooses to exert, little direct control (group composition, task structure, team performance orientation), in comparison with factors that the team leader can directly influence (e.g. participative safety, task orientation, etc.).

6.8.3. Practical Issues

It would be dangerous to over-simplify this important issue which is at the heart of successful change management processes in contemporary organisations. Some research has begun to look at what happens to traditional supervisors when an organisation starts to use self-managing teams (e.g. Jessup, 1990; Fisher, 1993). But the issue is far more complex in project management because of the strong role of the 'heavyweight' project manager and the relative autonomy and independence that he/she enjoys in the temporary project setting. Project team leaders will remain key

figures in the project development process because this is what project sponsors want and expect. But sponsors also demand high levels of performance and this requires a radical overhaul of existing HRM practices together with a fundamental change in team leadership practices. It is suggested that an important step in this transition would be the introduction of a 360° performance feedback approach for team leaders.

6.9. Conclusion

The most striking conclusion to emerge from the results of this study is that (probably) the most well researched and developed attempt to define and operationalise effective team working is not predictive of two outcomes that are critical measures of the performance of project teams: fee income and customer satisfaction. Although two dimensions of team climate were significant antecedents of high productivity and moderated complexity respectively, we are unable to conclude from this that the full team climate model is generically appropriate to the project management environment. Rather, the results suggest that there is a need to isolate the referent group norm that determines high performance in different project contexts and over different project time-scales. Anderson and West's extensive validation of the TCI confirms its ability to predict group innovativeness, while this study shows that task orientation explains 20 per cent of the variance in productivity and that vision explains 17 per cent of the moderated variance in perceived project complexity. But although this extends our understanding of the determinants of high performance team working, it does not give us sufficient confidence that the team climate model is a relevant performance-enhancing framework for all project teams.

Team processes must be shaped and allowed to evolve to suit the nuances of the project task. There is some evidence that the co-existence of shared vision and task orientation will help teams to manage the inherent innovation-efficiency dilemma in the construction project development process. Task orientation behaviours can

develop as a result of a conscious and purposeful approach to setting norms at the start of the project, while modelling leader practices can generate and sustain shared vision among team members. However, we must question the relevance of participation as a climatic state which can facilitate the attainment of high levels of project team performance.

But intervening in team processes is difficult and dangerous, particularly as the project development process gathers speed and task performance norms become entrenched. A better approach may be to create - through conscious design - an enabling environment which establishes, nurtures and supports key group processes. This requires that appropriate norms are identified and established at the start, that the team leader demonstrates consistently transformational and empowering leader practices, and that she uses performance feedback and HR performance orienting levers to keep the team focused on - and capable of delivering - the key project deliverables. To reprise Katz and Kahn's extremely useful concept of 'equifinality', the team leader must create a context in which his team can develop its own unique performance strategies.

The results suggest that three strategies can be employed to create conditions in which high performance project team working can emerge: team organisation, transformational leadership practices and team performance orientation.

1. Team Organisation. The establishment of group norms that are appropriate to task completion is *the* critical ingredient in the team development process. The link between tenure and productivity also suggests the importance of keeping intact teams together, although care must be taken to avoid the pernicious effects of 'group-think'. Group composition and team size are secondary design factors but may also be important design levers in some circumstances. Time spent in designing tasks (task

structure) adds little value to the team's propensity to perform, although its powerful causal effect on job satisfaction is notable.

2. Transformational Leader Practices both help to create a climate in which performance processes appropriate to task completion emerge, and directly impact on the customer's perceived satisfaction with the construction project development process. *Leadership is the critical enabling factor in designing teams for projects.*

3. Team Performance Orientation. The team can be focused on its performance through the management of customer feedback, and by the use of just-in-time technical and team skills training and contingent rewards. This strategy is particularly effective where shared objectives are required to counter extreme project complexity.

A diagrammatic summary of these conclusions is shown below in figure 6.3.

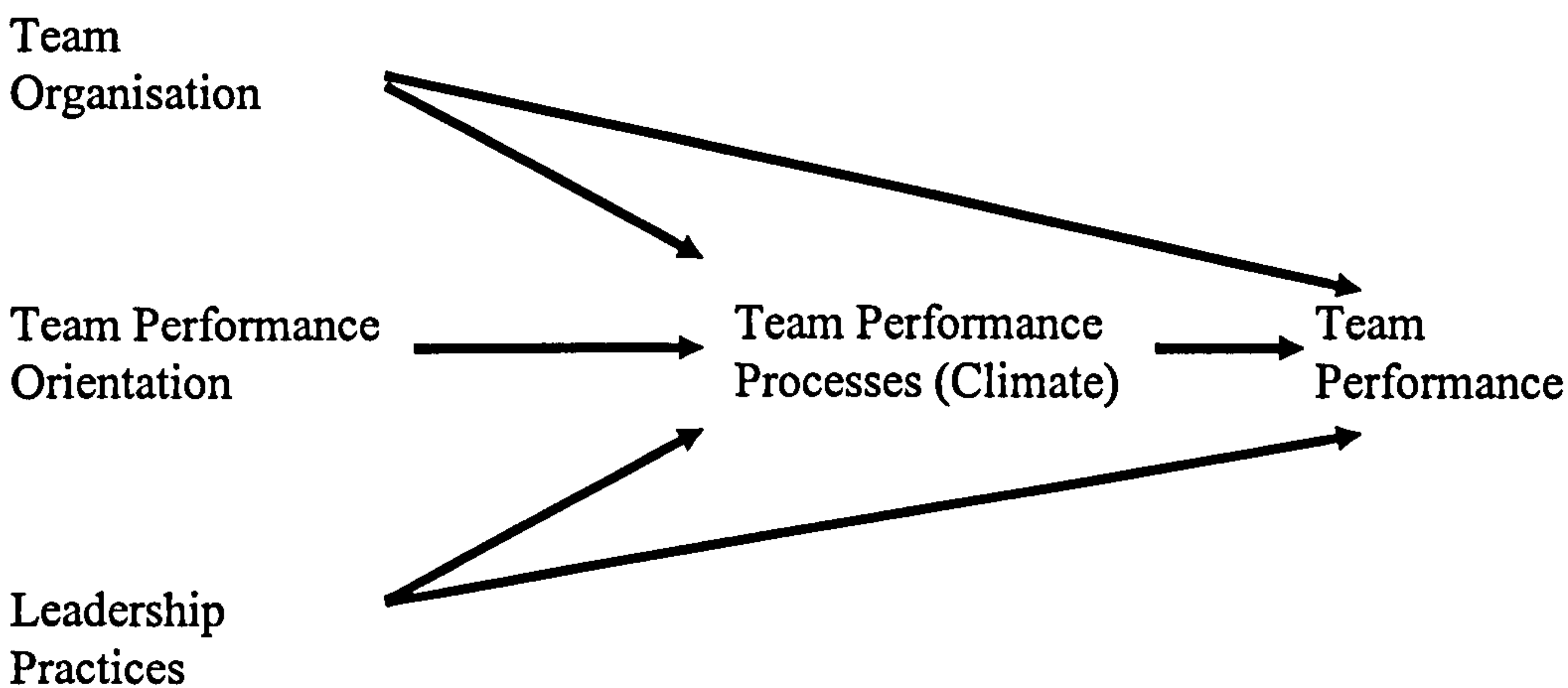


Figure 6.3: Designing High Performance Project Teams: the Key Enabling/Design Factors

Chapter seven will reconsider the burgeoning popular literature on team working in the light of the discussion presented above. It will suggest that much of the popular

management and pseudo-academic literature describes team working as both a universal panacea to the new industrial competition and as a psychologically satisfying experience for team members, but that this fails to advance our understanding of the determinants of the exceptional, or more usually, unexceptional performances of teams in different production situations. It will further suggest that where teams are an appropriate work organisation configuration, for example, in a complex project-oriented environment, they must be designed to enable them to achieve high performance, value-adding outcomes.

7.0. DESIGNING HIGH PERFORMANCE TEAMS FOR PROJECTS

7.1. Introduction

The discussion of the results of this study in chapter six contributes to our understanding of the complex interplay between structural, contextual, processual and performance factors in a project team environment. In particular the results highlight the importance of team leadership practices, team organisation and team performance orientation in creating an enabling framework for the emergence of team processes that are in harmony with the performance needs of the project. But the results also question the extent to which best practice models of team working, team process or team climate are conceptually or practically relevant in furthering our understanding of the determinants of real team performances. The moderate, positive, causal relationship between task orientation and productivity on the one hand, and the moderate, negative, causal relationship between team climate and perceived project complexity on the other, does not give us sufficient confidence to claim that teams are the panacea that their proponents claim them to be.

The existing literature on teams and team working tends towards prescription and exultation. Teams are presented as a remedy to the structural contradictions in capitalism by allowing organisations to break free of their cumbersome authoritarian hierarchies and to respond more flexibly to the vagaries of the free market. Teams can enable organisations to integrate pressures for simultaneous production efficiency with the need for continuous product innovation. At a seminar in London, Professor J.R. Hackman stated that, in the United States, surveys show that 64% of companies have introduced flexible work systems and, of these, self-directed teams are the most prominent new design type (Hackman, 1995). The explanation for this phenomenon is in the potential - but frequently unrealised - benefit of teams. Teams are perceived to be more effective than individuals working alone because they have a greater quantity and diversity of resources at their disposal; teams also have more flexibility and 'magic synergy' (or the '1+1=3' principle). And yet when he sent the manuscript

for his new book to his publisher in 1989, Hackman was advised to change its title from Groups that Work to Groups that Work (and Those that Don't). This was because, of the 27 team case studies described in the book, only four could be considered to be effective using Hackman's own three-fold criteria of group effectiveness (Hackman, 1990: 6).

This chapter will examine this paradox. First of all, it will present a critique of the popular and prescriptive literature on teams which claims that teamwork "holds all the cachet of a corporate Aladdin's Lamp. With it, anything is possible" (Schutz, 1989: 7). Despite the mushrooming of this literature there are few rigorous, empirical studies of genuinely successful teams. Equally, there are few writers who take a critical approach to the team concept or to the fervour with which it has been accepted as the new organisational design orthodoxy by managers in both private and public sectors. A review of the existing literature provides prima facie evidence that the team approach to work organisation design can be criticised on six levels: design, pluralism, individualism, commitment, maturation and functionality. Each of these factors will be discussed in turn, concluding with a brief review of how the findings in this study support or refute the critique. This will provide the underpinning to the second half of the chapter when we will return to the results of the research and discuss how they extend our understanding of the reasons why teams succeed or fail. In particular, this section will suggest some practical strategies emerging from the research that team-oriented organisations might employ to overcome what Hackman calls the 'tripwires' in designing and leading effective work teams (Hackman, 1990; 1995). These strategies relate to customer-focused team design, transformational project leadership, project team design 'principles', managing human resources as teams as well as individuals, and issues of transition and sustainability. Collectively, they represent a strategy for designing teams for projects.

7.2. A Critique Of Team Working

The literature reviews in chapters one and two presented the team as one remedy to contemporary structural contradictions in capitalism. It was argued that the apparent transformation of the economic landscape during the 1970s and 1980s was dictated by a qualitatively new form of competition emanating from Asia and based on continuous innovation in products, processes and forms of work organisation (Abernathy, et al, 1983; Whipp and Clark, 1986; Clark and Fujimoto, 1992). Although grounding their work predominantly in the manufacturing and engineering sectors, Abernathy et al (1983) argued that it was possible to reverse the economic decline by questioning existing design concepts and investing significantly in technological solutions. This reversal, though, could only be achieved if accompanied by a fundamental change in management thinking and a shift away from the existing preoccupation with short-term, financial returns towards a longer-term and continuous quest for product and process innovation.

Building on this conceptual approach, and also on the emerging body of theory variously described as post-modernism (Clegg, 1992), post-Fordism (Aglietta, 1979) and disorganised capitalism (Lash and Urry, 1987), writers like Clark (1986; 1987) and McKinlay and Starkey (1992) suggested that work organisation is key to the firm's ability to ingest product innovations, respond to changing customer demands and generate improvements in the production process. Products, processes and forms of work organisation are therefore viewed as part of a total process. Effectively reconciling market pressures for increased performance with the physical capabilities of the firm's delivery systems is seen to require a new approach to the way that people are managed in organisations. Corporate restructuring, in the form of devolved accountability (Storey and Sisson, 1993) and the search for flexibility (Pollert, 1992), has been accompanied by the emergence of human resource management. Although HRM has both hard and soft dimensions (Storey, 1987),

there has been a growing emphasis on policy goals such as commitment, motivation, empowerment, participation and self-development. These policies are seen as necessary antecedents to innovation and high performance, as well as to quality of working life in the new organisations.

It is argued that the form of work design that has emerged in so-called post-modern organisations to meet the need for flexibility and high performance is the team. The team provides a psycho-social environment in which individuals can be motivated to excel. Mechanisms of co-ordination and control are de-centralised and autonomy, responsibility, accountability and authority are located within the team's boundaries. Training, recruitment, external customer and supplier liaison, work scheduling, target setting and budget control are all controlled by the team. This high level of self-control results in work being valued, in individual pride, in willingness to add value, and in care. These work attitudes are then translated into desired organisational outcomes such as innovation, quality, flexibility, cost effectiveness and productivity. There is some documented evidence that the team organisation can lead to hard business benefits. Digital's Micro 11 business at Ayr in Scotland (Buchanan and McCalman, 1989) and Procter and Gamble's Lima plant in the United States (Waterman, 1994) are two examples. But these are relatively rare and, even here, the success is qualified. At Digital, residual concerns among team members included loss of enthusiasm for the original ideas, compromises to the 'ideal vision' of autonomous working and less autonomy and 'front to back' responsibility than was originally intended (Buchanan and McCalman, 1989: 188).

Although the team organisation does seem to be an appropriate conceptual and practical response to the new industrial competition and the link between an autonomous, multi-skilled team and organisational outcomes such as flexibility is a straightforward and common-sense one, we must question whether the paucity of rigorously researched and documented team successes is adequate to justify the

proliferation of prescriptive management books urging the transition to team designs characterised by high levels of member participation and empowerment (e.g. Harrington-Mackin, 1996). Of course, it can be argued that much of the literature advocating the transition to self-directed teams is merely providing a route map for those organisations who are either inclined or impelled towards new work design models. Thus in the foreword to Orsburn et al's (1990) Self-Directed Work Teams: the New American Challenge, Procter & Gamble's Organisation Development manager writes:

“Self-directed work teams really do work... Sure these team structures take some getting used to by everyone, technicians as well as managers. The path the authors trace in this book is not without some rough spots. But self-directed teams really do work. There are dozens of issues to take on, such as how to divide the work, how to exchange feedback, how to compensate people, how to redirect the efforts of managers, how to increase control by letting go, and how to explain to incredulous outsiders that what you are doing is really a good thing...Yes, if you aren't careful you can confuse people and let go. This book has been written to prevent you from going over the precipice” (Orsburn et al, 1990: vii).

It is easy to dismiss management books of this type which seek commercial success and not necessarily academic credibility. But Guest (1992), for example, in a critique of In Search of Excellence, concludes that “[i]f a message rings true, if it appeals to values and to emotion and if it appears to have some practical implications, then all the social science evidence that can be assembled against it becomes relatively unimportant” (Guest, 1992: 17). But there still remains a nagging doubt. Changing organisations can nurture extreme anxiety, uncertainty and stress amongst those affected (Carnall, 1990: 138ff). How morally justifiable is it to present the argument for change to susceptible managers searching for an antidote to harsh trading conditions without giving them a balanced case from which to make an informed

decision? Although this study is generally supportive of the team concept - for ethical as well as economic reasons - there remains a degree of uncertainty if a) more than a very small proportion of teams are ever likely to achieve their potential, or b) the team concept is truly reconcilable with the social and economic relations of production in capitalism? The next section will therefore discuss six factors which contradict the relevance and application of team working in contemporary organisations and thereby provide a balance to the uncritical prescriptions of the team evangelists.

7.2.1. Design

Child (1984) states that all organisations have some form of structure which consists of “all the tangible and regularly occurring features which help to shape its members’ behaviour”. Determining exactly what is the most effective organisation structure has been a continuing theme in social science research since Weber’s (1947) celebration of bureaucracy. However, the most pragmatic approach is associated with the work of Burns and Stalker (1961), Woodward (1965), Lawrence and Lorsch (1967) and Perrow (1967) who argue that the organisation’s structuring must be contingent upon the external environment, prevailing technologies and existing systems of social relationships. Critical of its inherent determinism, both Child (1972) and later Mintzberg (1989) extend contingency theory by suggesting that there is an element of strategic choice in the configuration of organisational structures which is based on management’s perception of the environment and technology. “The important implication of this conclusion, in sharp contrast to that of contingency theory, is that organisations can select their situations in accordance with their structural designs just as much as they can select their designs in accordance with their situations” (Mintzberg, 1989: 322).

Mintzberg concludes that there are six basic organisational configurations which reflect choices in relation to structural design and the environment. Of the six types, *adhocracy* is seen to “suit the industries of our age” (ibid: 349). The adhocracy is an organic structure in which highly professional specialists are encouraged to work together in ‘smoothly functioning creative teams’ which can cope with complex and dynamic environments. Power is based on expertise and is dispersed throughout the structure. Although there are different forms of adhocracy they all tend to organise production around either internally or externally sponsored projects. Variants of the adhocracy model are common in the prescriptions of management gurus like Peters (1987) and Kanter (1988), as well as in the work of respected academics like Drucker (1988). The transition to new information- and knowledge-based organisations are characterised by their lack of hierarchy, the use of small, decentralised business units, and the creation of self-managing teams.

The redundancy of hierarchy is a key theme in this literature and one that is central to the development of the team organisation. But are ‘machine’ or ‘professional’ bureaucracies (Mintzberg, 1989) necessarily incongruous with post-industrial market conditions? Jacques (1990; 1992) does not think so. He argues that teams are a ‘gimmick’ or a ‘fad’ intended to improve morale and creativity, but in reality, that have “burdened our managerial systems with a makeshift scaffolding of inept structures and attitudes” (1990:127). Hierarchies have existed for 3000 years because they recognise that there are higher and lower levels of complexity and that there also natural discontinuities in complexity that separates one task from another. Hierarchies reflect a stable and natural order in human society which allows individuals with different levels of competency and ability to find the right level of work (Rowbottom and Billis, 1987). The problems encountered by the company chairman are inevitably more difficult than those faced on the shop floor. Although hierarchies have been corrupted by excessive layering, the dilution of the potential for manager ‘added value’ at each level, and by their tendency to breed insensitivity,

careerism and self-importance, they do nevertheless “take into account the real nature of employment systems” (Jacques, 1990: 128): people are employed individually, not in groups. This means that only individuals can be held accountable for the work that they do. If a group is to be given real authority and power it must be held accountable as a group.

Jacques’ argument is persuasive because it addresses two fundamental design issues: task competency and the location and extent of decision-making authority within the team. Both factors are important to a full understanding of the potential for high performance team working. Project teams exist to perform a specific task and combine the skills of an appropriate mix of technical specialists. In isolation, these technical skills are obsolete. But when fused with complementary skills they become imbued with productive energy. In project teams, individual specialists work alone for much of the time because this is their strength; and yet they are also working concurrently with other specialists, passing information back and forth and adding value to the development process. To be effective information must flow laterally between equals, not vertically. The sub-division of complex tasks into packages of competency encased in human form is a critical activity. But the key to effective task design is that the interfaces between specialist activities are not encumbered by the intrusive and inhibiting effects of unnecessary layers of bureaucracy.

Following Jacques (1978), Rowbottom and Billis (1987) argue that there is insufficient attention paid to the internal structuring of teams. Project teams within the construction industry, however, tend to be highly structured and levels of authority are clearly demarcated within the team. Because of the sector’s contractual biases, boundary relationships are even more structured. It would be difficult to argue that this situation has had a positive impact on the industry’s overall performance. Latham (1994), for example, states that although “[u]nequivocal evidence about performance on site... is hard to find... [s]ome large clients certainly

believe... that British performance is below that of our international competitors” (1994: 63). The findings in this study are not particularly helpful, although we have noted the failure of the task structure variable to predict any dimension of team climate or measure of team performance. The issue of authority within project teams was not central to the hypothesis development and testing process, and this was probably based on the assumption that questions of authority are incongruous with popular notions of team working. On reflection this was unwise. As Rowbottom and Billis (1987) suggest, we should not assume that a particular set of structural options necessarily flow from a bureaucratic or non-bureaucratic design: “structural issues of authority relationships emerge in organisations both ‘authoritarian’ and ‘participative’ in general style or culture” (1987: 69). It is suggested that the issue of authority structures and relationships within teams and their impact on both process and performance is one area that requires further research.

7.2.2. Pluralism

In examining the relationship between industrial relations and Human Resource Management, Guest (1995) states that the rising interest in HRM during the 1980s was accompanied by the decline in the significance of industrial relations. Although the reasons for this are complex, it is implied that this is part of a general trend from a pluralist to a unitarist conception of employee relations. This is an underlying theme in the HRM literature. Storey (1995), for example, in attempting to unravel the meaning of HRM suggests that “the aim is not merely to seek compliance with rules and regulations from employees, but to strive for the much more ambitious objective of commitment” (1995: 5). Legge (1995), also, compares the ‘soft’ development side of HRM with “Fox’s (1966, 1974) unitary frame of reference (with the emphasis on compatibility of stakeholders’ interests, shared vision and culture)” (1995: 37). At the heart of the unitarist approach is the notion of employee commitment. Commitment is the key HRM policy goal (Guest, 1987; 1995) because it offers the

prospect that the individual employee “will go that extra mile for the company” (Guest, 1995: 113).

The unitarist-pluralist dichotomy is typically discussed in relation to managerial strategies towards trade unions (Storey and Sisson, 1993; Guest, 1989, 1995). In unionised workplaces, the issue is whether or not the goals and values of management and the work force are compatible. Legge (1995) argues persuasively that the language of HRM “is that of managerial triumphalism. Managers create missions for their organisations, they change their cultures, they act as transformational leaders that gain the commitment of employees to the values of quality, service, customer sovereignty, that is translated into bottom-line success” (Legge, 1995: 55). How workers respond to the introduction of team working is illuminating for two reasons. Firstly, because of the (implied) significance that the HRM literature attaches to the role of team working as a new model of work organisation design. And secondly, because the decision to introduce team working is a managerial strategy. The way that workers - the new team members - firstly perceive, and then react to, the change in working practices and social relationships that accompany the transition to team working will determine to what extent they have internalised management’s values. In unionised environments, the existence of two competing value systems - those of management and of the trade unions - may prove irreconcilable unless the idea of team work can provide some common ground. In non-unionised environments, there may be more opportunity to create a consensus around the implementation of certain HR initiatives. But the proliferation of change programmes designed to capture ‘hearts and minds’ in UK organisations suggests that this is far from automatic.

In a case study of the Vauxhall Motors Luton plant, Carr (1994) found that the introduction of team working was achieved following a long period of negotiation between management and unions which eventually saw a trade-off between limited

protection of union influence in exchange for new working methods and an enhanced supervisory role in exchange for a reduction in their regulatory powers (1994: 208). The creation of 15 member teams responsible for quality, output, inspection, repair, cleanliness and some maintenance, job sharing and process improvement was the central element in management's change strategy. The unions, however, were suspicious for three reasons. Firstly, they viewed team working as a new way of improving productivity by creating a climate of competition between teams which would lead to peer pressure to increase effort and attendance within the teams. The result would be job losses and less favourable working conditions. Secondly, the unions were concerned that the changes would lead to a deterioration in their traditional control over working practices. And finally, the unions were worried that the new grade of team leader would undermine the role of the shop stewards, resulting in a loss of status for the whole union (Carr, 1994: 203).

In the final agreement, Carr (1994) concludes that both sides achieved their objectives. For management, team working was established, along with the new role of team leader and a commitment to continuous improvement, while the unions ensured that their representative role would be maintained. However, the implementation of team working highlighted further potential for division. Management, for example, believed a corollary of team work would be a diminished role for shop stewards, many of whom had in fact applied for the new team leader role. The unions, on the other hand, were still to be convinced that many managers were capable of accepting team autonomy and decision-making. Indeed, there was a question of how much autonomy and empowerment was practically achievable in the assembly process. These substantive issues continue to influence the nature of the relationship between managers and unions at the Luton plant. This relationship, in turn, creates natural boundaries to the possibilities for performance and satisfaction enhancement resulting from effective team working.

Guest (1995) uses a matrix to represent four possible variants of individual commitment to company and trade union. This is juxtaposed against a second matrix which identifies four policy options facing organisations. The first, 'new realism', emphasises the convergence of stakeholder interests "and the importance of participation, power equalisation, trust and commitment" (Guest, 1995: 119). Citing Storey's (1992) case studies, Guest (1995) suggests that there is little evidence of a new partnership between unionism and HRM in the UK. "Management sets the agenda, which is market-driven, while industrial relations issues are relatively low on the list of concerns" (Guest, 1995: 121). The second variant, 'traditional collectivism', is the maintenance of existing industrial relations machinery without HRM and can be found in British Coal and large sections of the public sector (police, health service, local government and education). Here, too, the agenda is managerialist and unions exist in an emasculated and marginalised form. 'Individualised HRM' is the third variant and is characterised by attempts at strategic integration through the use of mutually-reinforcing HR policies in selection, development and reward. Guest (1995) is again sceptical of the universality of this model, arguing that there are very few examples of companies that have successfully promoted a high HRM, non-union approach. This leads him to conclude that the fourth variant, 'the black hole', is the destination of most organisations. Here, the competitive driver is a low cost strategy where labour is viewed as a variable cost and neither an industrial relations strategy or an HRM strategy is adopted. The trend away from union recognition in new sites is noted by Disney et al (1993) and Marginson et al (1993) (both cited by Guest, 1995: 126). At the same time, there is no attempt to employ an HRM strategy "to obtain full utilisation of the workforce by gaining its commitment to company goals and values" (Guest, 1995: 126). If Guest (1995) is right, and he is supported by Storey (1995) who sees a tidal ebb towards a "cost minimisation, low-skill, low-pay, corner-cutting approach" (1995: 383), then this is a problem for the development of team working. This is because the revolution in working practices and social relations associated with the transition to

team working requires a high investment in human resources. Although team working can exist in a dual-commitment, unionised environment, its strength resides in the ability of the organisation to create a single-value system where the interests and attitudes of stakeholders - while not necessarily reconciled - can be harnessed.

This final point is important. Although HRM presents itself as a unitarist philosophy grounded in policies which assume no underlying and inevitable differences between managers and other groups of employees, and which therefore seeks employee commitment based on common interests and priorities, how feasible is it to expect the values of individuals, teams and organisations to be genuinely co-defined and internally consistent, even in new realism or individualised HRM environments? Blanter and Belcher (1994) argue that managerial strategies or initiatives, no matter how well intentioned, are defined by management and therefore reflect one view of reality. In introducing a new system, even one as politically correct as tenant participation, “the flow of meaning is from landlord to tenant” (Blanter and Belcher, 1994: 116). It is the landlord who controls the system and therefore retains the absolute right to determine how tenant participation will be applied. Is it reasonable to expect that a managerial decision to introduce team working, or some other form of employee involvement, will inevitably coincide with the attitudes and values of those with less power? Blanter and Belcher recall a comment made by a tenant at a housing association workshop: “Landlords are always asking us for things - and now they want bloody participation as well” (1994: 114). And Legge (1995) identifies what for many organisational members is quintessential: “If we are all managers now, why is that those holding conventional management positions lay claim to power, privileges and material returns far in excess of those received by these new management stakeholders in the organisation?” (1995: 55).

Although in only one of the interview cases was the author aware of a definite gap between the perceptions of the team leader and those of his team members

concerning the climate in his (higher performing) team, the quantitative results of this study clearly show that team leaders and team members can have widely different versions of social reality. This is probably not grounded in competing value systems but rather in the material conditions of the two groups of employees and changes in the psychological contract, particularly as the team leader's career pushes him closer to corporate management. Paradoxically, the writer suspects that, within Conorg and other project management organisations of its type, mistrust or generally poor relations between project teams and the corporate centre can lead to an improvement in the performance of the team. Although it is feasible that the unifying effect of, for example, isolation and alienation may be deleterious, the resultant strengthening of the team sub-culture may generate a determination to succeed 'in spite of management'. However, this will be influenced by the team's feelings of responsibility to the project sponsor and how significant the task is perceived to be by the team. Despite this, the team is unlikely to achieve its performance potential if the team leader is not fully committed to undertaking those enabling or design activities that contribute to the establishment and maintenance of favourable performance conditions.

7.2.3. Individualism

Like unitarism, individualism is an essential component of the normative HRM model and is the antithesis of the "collectivised, procedure-based and strife-ridden industrial relations model" (Storey and Sisson, 1993: 227). The individualisation of the employment relationship is revealed in the spread of interest in Performance Management schemes (Armstrong, 1994) and in the potential for autonomy and home-working associated with the so-called information super-highway. Within Conorg, Performance Management is defined as "the process of continuously improving organisational, team and individual performance and is a shared process between managers, individuals and teams". This definition encompasses several core

HR activities such as total quality, coaching and, by implication, reward and recognition. But despite the reference to teams in Conorg's literature, the practice of Performance Management concentrates on individual performance and development. Indeed, most Performance Management schemes have three elements: setting specific and measurable objectives; monitoring and reviewing progress against these objectives, annually as well as on an on-going basis; and the reinforcement of desired behaviours through the use of contingent rewards and the identification of learning and development needs. Although there is no reason why these elements could not be applied at the level of the team, they invariably focus on individual performance, contribution and development.

On the one hand, then, we have HRM policies and practices which are concerned with individual performance, reward and development, and which can also be seen in recruitment and selection and succession planning activities. And, on the other, we see a parallel emphasis on team working as groups become the ubiquitous performing unit. Legge (1989) argues that this is one area where the HRM model is internally inconsistent, and highlights the potential conflict between the importance of the individual and the desirability of both co-operative teamwork and employee commitment to the organisation (1989: 35). The transition to a team-based organisational form is undermined by this devotion to individualism. For example, the prevalence of individual performance-related pay schemes encourages competition and fragmentation in the workforce. Leadbeater (1989) argues that the "most important tension will be within new approaches to human resource management - between the new collectivism of team working and the new individualism of performance related pay" (cited by Storey and Sisson, 1993: 96). Similarly, O'Dell (1989) states that tensions between team working and merit pay and appraisal schemes are in evidence in a number of American companies, including Honeywell, Eastman Kodak and GE (cited by Storey and Sisson, 1993: 97).

The results of this study showed that Pearson correlations exist between team orientation and both shared vision and task orientation at the one per cent level of significance. Moreover, the stepwise procedure confirmed that team orientation was predictive of shared vision. There is some evidence, therefore, that support mechanisms which reinforce team performance can contribute to an enhanced team climate, and this is extremely important in complex projects. Traditionally both personnel management and HRM have viewed policy choices about resourcing, performance evaluation, training and reward as primarily choices about individuals and corporate systems. They have been much less adept at managing groups as human resources. If teams are as important as they seem to be, and if HRM genuinely seeks to achieve internal 'fit', these choices must extend to the effective design and maintenance of new teams.

This study has presented some preliminary results, but there is an opportunity to extend this research by exploring how corporate HRM policy choices can apply leverage to team performance, and what effect this has on the individual-organisation 'psychological contract'.

7.2.4. Commitment

The problem of converting strategic intentions into operational reality is a recurring theme in the literature (e.g. Quinn, 1980; Johnson, 1987; Mintzberg, 1990; Pettigrew and Whipp, 1991). From a similar position, Marchington (1992; 1995) states that "the translation of [Employee Involvement] from broad management policy to specific workplace practice, let alone employee commitment and performance, is problematic" (1995: 281). Although there is a general acceptance - even among trade unionists - that team working can lead to greater flexibility and product quality in the production process, as well as to improvements in the quality of working life of team members, this alone is insufficient to ensure the translation of strategic intent

into operational reality. The successful implementation of a high performance team working strategy is singularly dependent upon the commitment and support of managers at all levels within the organisation to *physically* make it happen.

The results of the data analysis presented in chapters five and discussed in chapter six showed that leadership practices are the biggest single predictor of customer satisfaction, a positive team climate, and internal work motivation in the population of construction project teams. But, in addition to this, we can expect that line managers are also well placed to implement physical changes in the design and experience of the work of their team members. Line managers, therefore, have both a behavioural and an organisational role to play in the transition to a high performance team work system. Marchington (1995) identifies four “critical points at which managerial actions or inactions can reduce the impact of schemes or cause them to function in ways which were not intended by their architects” (1995: 286): incomplete coverage, competing initiatives and contradictory rationale, lack of commitment by first-line managers, and other practical reasons for implementation failure.

7.2.4.1. Incomplete coverage

Although management may intend that all employees are touched by involvement, team working or empowerment programmes, in reality very few are affected. Because project team working is a work organisation configuration, rather than a bolt-on activity like quality circles or consultative committees that run parallel to work processes, we might expect a wider coverage. However, the transition can still be negatively influenced by the tightness of production or service programmes or a workforce that is geographically dispersed.

7.2.4.2. Competing initiatives and contradictory rationale

If team working is one of a number of initiatives introduced as part of a wave of management 'faddism', then there may be considerable overlap, confusion and even competition between them. Moreover, because different departments may have responsibility for different initiatives this can increase the likelihood of competing initiatives and contradictory rationale. In Conorg, for example, 'partnering', 'continuous improvement' and 'performance management' fell into the domain of Procurement, Quality and Personnel departments respectively. Although these initiatives may be co-ordinated centrally under the umbrella of a quality council or a steering group, they can send out different, and sometimes contradictory, messages to managers and managed.

7.2.4.3. Lack of commitment by first line managers

Organisational de-layering and the re-formation of production processes into self-directed team cells poses challenges for the traditional roles of first-line manager and supervisor. The findings in this study suggest that the change in leadership style from planning, organising, directing and controlling to modelling, enabling, inspiring, encouraging and challenging and is key to the success of high performing teams, but one that is extremely difficult. "The language of team working and empowerment, while potentially attractive to more senior managers, can appear highly threatening and problematic to their more junior colleagues whose authority has often been built on technical expertise and the restriction of information flows to the shop floor" (Marchington, 1995: 289). In addition, first-line supervisors who have close working relationships with workers and understand what they perceive to be their 'true' motivations, may feel that corporate ideas of involvement and empowerment are misguided and potentially injurious to performance. Where the

price of failure is very high - in construction projects, for example - and where the first-line supervisor is accountable for that failure, we would expect considerable resistance to the implementation of 'unsafe' working relationships and practices.

7.2.4.4. Practical reasons for implementation failures

Marchington (1995) states that even where managers at all levels share a common commitment to team working, practical factors can prevent the implementation of new working practices. These include work overload and the lack of training of supervisors in the techniques of change and the operationalisation of the new schemes.

Although Marchington's (1995) explanation is based on studies of employee involvement and participation, and the quantitative results of this study question the value of participation strategies in some work cultures, his analysis of the depth of line-management commitment is relevant to the general critique of team working presented here. Management's commitment to change at all levels is the single most important factor which facilitates or impedes the implementation and reinforcement of new working practices and relationships (Colenso, 1997: 71-72). Given the potential for equal exposure to the organisation's improvement initiatives, the writer has witnessed a myriad of different shades of empowerment, leadership style and team working within Conorg. Examples where the team leader has genuinely tried to redefine the locus of decision-making authority between himself and his team sit side-by-side with those where power is jealously guarded and centralised in the hands of the Project Manager. Although we have no cast-iron empirical evidence that projects managed under contrasting leadership styles deliver different levels of income, the results of this study do provide evidence that team climate, customer satisfaction and individual work motivation are all significantly higher where the project manager demonstrates transformational leadership practices. If exceptional

team working is to be achieved it requires high levels of commitment to its design, development and maintenance.

7.2.5. Maturation

We have already noted that work teams are different from other forms of employee involvement such as quality circles and problem solving groups because the latter are usually appendages to the production process, whereas the former *is* the work organisation configuration in which value is added to, for example, product manufacture or to a project development process. However, it is argued that both team variations have the potential for failure because of the effects of maturation and decay.

Collard and Dale (1989) cite research carried out between 1983 and 1985 which indicates that “only a minority of [127] organisations which have introduced quality circles have not experienced a failure of an individual quality circle, if not the programme as a whole” (1989: 366). Although the reasons for failure were myriad, and included some of those discussed already (e.g. lack of co-operation from middle management; circle leaders lacked the time to organise meetings, groups were spread over too wide a work area; inadequate training; lack of support from the circle’s facilitator; poor circle leadership), several factors had a temporal dimension. Maturation was revealed in redundancy or restructuring caused by the economic situation; labour turnover; circles running out of projects to tackle; delays in responding to circle recommendations, and failure to get solutions implemented. These factors show that innovations exist within a temporal context and that the character of change at the operational level over time must be considered (Pettigrew and Whipp, 1991: 169).

But although the “transition from one structure to another, the mutation, often remains, in history as in biology, the most perplexing zone” (Ladurie, 1979, quoted by Pettigrew and Whipp, 1991: 169), it is not inevitable that innovations - whether in forms of work organisation or other phenomena - must decay and cease to function over time. Despite Guest’s (1995) despondent conclusion that many organisations are slipping in to a ‘black hole’ model of people management practice, there is evidence that many of the management and organisation principles that emerged with industrialisation and factory discipline are being seriously questioned and eroded in progressive organisations.

Nevertheless, although the findings in this study do not suggest that tenure is negatively correlated with either team climate or leader practices, the other measure of time - project duration - did produce negative Pearson correlations both with all of the leader practices and with all of the dimensions of team climate except support for innovation. This is not necessarily problematical in terms of organisation outcomes because all of the performance measures and job satisfaction were positively correlated with project duration: the correlation with net income, for example, was $r = .81$ ($p < .01$). However, it does indicate that because transformational leadership and team climate are, in the construction project management environment at least, learned behaviours, they must be reinforced. This will require that the new behaviours are legitimised by the parent organisation, probably using reward and socialisation processes, as well as mechanisms for intrinsic and concurrent feedback.

7.2.6. Functionality

Teams are popular work organisation designs because they offer the prospect of renewed and sustained competitive advantage. Teams are described in the literature as enabling the organisation to achieve goals of flexibility (Kanter, 1983), quality (McElroy, 1985 Ripley and Ripley, 1992), high performance (Buchanan and

McCalman, 1989; Katzenbach and Smith, 1991), innovation (Anderson and West, 1992), workforce integration (Irvine and Baker, 1994), productivity (Bursic, 1992; Mayer and Schoorman, 1992), added customer value (Hammer and Champy, 1993), learning (Senge, 1990), safer working environments (Pearson, 1992), low turnover (Cohen, 1993), job satisfaction and culture change (Kanter, 1983; Carnall, 1990). But how genuine are these claims? Conorg is a team-based organisation. The bulk of its commercial work is carried out by project teams. But the measure of climate used to assess team work effectiveness did not predict either income or customer satisfaction, and there was only a relatively small relationship between team climate and productivity. Bursic (1992) in a similar quantitative study of manufacturing teams also found no evidence of a causal link between the use of teams and increased productivity and quality. Pearson (1992) found only a marginally higher level of productivity among autonomous work groups in comparison with traditionally managed groups at an engineering workshop in Western Australia. Even much publicised experiments like General Motor's Saturn plant in Tennessee left one generally positive analyst saying "it remains to be seen whether this will produce financial success. Saturn is still far from making money, and it labours under a mighty burden in trying to do so" (Geber, 1992: 35).

There are several alternative explanations for this phenomenon but two are convincing. Firstly, the power of team working is related to the interdependency needs of the task. A group of people all reporting to a manager, with individual responsibilities but also departmental objectives, is different from a specially constructed project team which works together on a full-time basis to initiate and implement a project solution. Encouraging department members to participate in unnecessary and burdensome problem-solving or information-sharing sessions with colleagues with whom there is little task-related dependency may deflect individuals from achieving their own work goals. There is a tendency to assume that all tasks designed for individuals can be achieved more efficiently or effectively by teams.

But this is unlikely to be true unless the transition to team working accompanies is accompanied by the 're-engineering' of existing organisational functions into customer-focused processes.

Although the re-engineering argument can also apply to project organisations which have been the repository of highly specialised technical disciplines, the effectiveness of the team is more likely to be associated with the nature and strength of the group's referent performance norm. In chapter two we cited Hogg's (1992) conclusion that the contradictory findings of research into team performance is attributable to the failure of the researcher to isolate the *referent group norm* that predicts performance in different contexts and over different time scales. In an earlier study of the relationship between group productivity and cohesiveness, Stogdill (1972) explains that the two factors are positively related only under conditions of high group drive, and they tend to be negatively related under conditions of low drive. Shea and Guzzo (1987) call this 'drive' 'group potency'. Potency is the collective belief of a group that it can be effective given its perception of its task environment and the resources available to it. The results of this study suggest that group norms are predictive of task orientation, support for innovation and social desirability, and that task orientation is in turn predictive of team productivity. However, further research is required to determine which norms are influential in other group performances and how these norms emerge and then change over time. This will further extend our understanding of the determinants of group effectiveness by continuing the trend (adopted in this study) towards greater specificity in variable definition and hypothesis testing.

7.2.7. Summary

The character of the critique presented so far in this chapter has not been to abrogate team working as a model of work organisation design which is relevant to the needs

of individuals and organisations in a world of unstable and imperfect markets. It does, however, question the simplistic approach with which proponents of team working offer it as an unproblematic and quick-fix solution to organisational maturity and decay. In particular, it has identified some conceptual, practical and ideological barriers to teams, some of which - like pluralism - are deeply embedded in the social relations of production that have evolved in capitalist economies. Even where organisations have attempted to adopt a unitaristic approach to the management of the employment relationship, the ideology of Human Resource Management continues to accentuate the importance of individual performance and contribution, often at the expense of the team. Indeed, HRM policies and practices (and education) concentrate on individual differences through the use of techniques such as job analysis, selection centres, appraisals and performance-related pay. Although diversity is far from inconsistent with team working, the application of these techniques is incompatible with team approaches because they frequently encourage competitiveness and self-interest.

But if many organisations do not provide fertile ground for the transition to high-performing team systems because traditional adversarial attitudes to the wage relationship persevere, or because senior managers and HR personnel lack the vision, skills, commitment and/or resources to effect the necessary changes, the highest barrier remains the willingness and ability of line managers in operational roles to modify their behaviour. Line managers - in this case, project managers - are critical in both the transition to, and maximum utilisation of, team-based work organisation designs. This is primarily because of the importance of non-proceduralised leadership behaviours in the creation of a positive team climate. Within Conorg, organisational restructuring and the creation of business centres has not been followed by appropriate changes in management styles or social relations. Project teams exist within these business centres but real progress towards the creation of the

conditions for high performance team working is limited by the persistence of traditional paradigms and work practices.

The first half of this chapter has presented a critique of the team working cornucopia. It has identified six levels at which the team work best-practice model may be susceptible to criticism: design, pluralism, individualism, commitment, maturation and functionality. The results of this study were considered in relation to this critique and, where relevant, suggestions were made for future research which adopts a genuinely critical approach to team working models. The final section of this chapter will turn to a more positive consideration of how the research findings in this study improve our understanding of the determinants of high performance team working and what practical strategies might be employed to realise the great potential benefits of teams.

7.3. Designing High Performing Teams for Projects

The critique presented above identified the moderating effects of organisational factors and some fundamental structural deterrents within capitalism which require us to challenge the unproblematic use of metaphors like 'revolution' and 'post-industrialism' to describe contemporary changes in work organisation design (Piore and Sabel, 1982) and the tendency of popular management writers and consultants to perpetuate the myth of the effortless transition (McCalman and Buchanan, 1989: 19) to high performance team systems. The results of this study suggest that the design of teams for high performance is a potential source of competitive advantage for many of the reasons cited above (section 2.6.) but that existing prescriptions - such as the team process (e.g. Kelly, 1994; Harrington-Mackin, 1996), team development (e.g. Tuckman, 1965) and team roles (e.g. Belbin, 1993) genres - may not be particularly helpful in increasing our understanding of the determinants of effective team working. This final section will consider how the key research findings build

on a critical assessment of the literature to provide some recommendations for the theory and practice of high performance project team design.

This study of 49 project teams in the construction industry contributes to a small body of theory which has tried to isolate the key structural, contextual and processual factors which explain the different performances of real work teams. It builds particularly on the conceptual insights of Richard Hackman (1976; 1980; 1986; 1990; 1992; 1995) and the a priori theory that conditions for high levels of team performance can be created at the team's inception or design stage. This approach contrasts with many team performance models which assert that group process is related to effectiveness (Goodman, 1986) and that effectiveness can therefore be enhanced by *directly* intervening in group processes (e.g. Harrington-Mackin, 1996). At a practical and applied level, this study is also a function of the organisational context in which the research ideas formed and where the empirical research was undertaken. In 1990, the performance of Conorg's project teams was described as a source of competitive disadvantage when compared with the performances of project teams in the United States and Europe (Temple, 1990). Although early attempts to redesign individual roles were not followed through, a link between project team performance and work design was established. It is argued that this link between work design and team performance is important for all project-oriented organisations, irrespective of industrial sector. Project teams are short-term, temporary, quasi-autonomous organisations. The ability of the team leader to mobilise her team and quickly reach, and then sustain, high performance is critical. However, it is also suggested that the notion of a work design intervention must be extended from a narrow focus on the organisation of discrete tasks into jobs to an understanding of design as a multi-faceted 'total' concept (Morley and Hosking, 1992) which embodies leadership practices, team organisation design and team performance orientation.

In designing teams for projects, the results of this study indicate that five factors are relevant. These can be summarised as follows:

1. The customer's unique needs for the project defines the team's purpose and should be the basis of the team design process, both at its inception and throughout the team's life-cycle. The team should seek to overcome its insularity and attempt to integrate with the customer organisation, developing, implementing and modifying performance strategies which are consistent with customer needs and expectations.

2. The application of project team design 'principles' can assist in the creation of an environment in which teams are enabled to achieve high levels of performance. The pivotal design principle is the isolation and installation of the group performance norms which are antecedents of the performance outcomes sought by the key project stakeholders. Cohesiveness may be encouraged, but only insofar as it is built upon consciously and purposely created norms which support, and do not inhibit, performance.

3. The findings in this study suggest that transformational leadership is the most significant enabling factor in releasing the potential of individuals working within project teams. Transformational leadership defines team climate and can be the source of added value to the project development process (as perceived by the customer). But transformational leadership also impacts on perceived customer satisfaction and therefore has a direct link with project performance.

4. In project-oriented organisations, HRM has an important role in providing teams with a performance orientation using training and rewards strategies. However, in order to achieve 'fit', HRM must first reconcile its ideological focus on the individual wage-relationship with the performance and development needs of teams.

5. The role of the project team leader is instrumental in ensuring a lasting transition to a high performance team system/culture. Leaders must a) understand the principles and practices of total organisation design and team performance orientation, and b) practice transformational leadership. Education and development programmes can support this transition, as can the introduction of an appropriate system of 360° appraisal, but real success is only likely to be achieved if accompanied by a change in corporate culture and values.

Alone, each of these factors may lead to a discrete improvement in the performance of an individual project team. But it is only when all of these factors are implemented as part of an integrated approach to the redesign of work within a genuinely supportive culture that the prospect of a high performance project team system is realisable.

7.3.1. Customer-Focused Team Design

Without customers organisations cannot create value. This realisation has generated popular interest in managing and improving - and then demonstrating and measuring - customer value, and in how organisations can achieve market success by aligning their people and processes to the needs of the market place. Although approximating to Guest's (1996) notion of 'strategic fit' between HRM policy and practice and external contingencies, the popular manifestation of 'fit' has been captured (and copyrighted) by Hammer and Champy's concept of Business Process Re-engineering (BPR). We have already discussed in chapter one how BPR has attempted to update work redesign methodologies by urging firms to focus on and then re-engineer the processes that lead to the direct satisfaction of customer needs (Hammer and Champy, 1993). Organisations like British Telecom, Otticon, IBM and Xerox (Geanuracos and Meiklejohn, 1993: 196f.), for example, claim to have identified key customer 'satisfiers', mapped the critical value-adding processes and simplified

business structures and systems, eliminating some non-essential support functions en-route. Specialist conferences produce myriad speakers from organisations as diverse as Rank Xerox, Raychem, Harvester Restaurants, Boots the Chemist and Mercury Communications who declare that they are reaping significant benefits having created empowered, multi-functional teams which are achieving superior customer value. Similarly, 'case-studies' in practitioner journals such as *Total Quality* and *Team Performance Management* recount the experiences of organisations including Toyota, Caterpillar, Royal Mail, British Telecom, Natwest Life and PepsiCo who have implemented self-directed teams and are achieving improvements in quality, productivity, cost reduction and job satisfaction.

But if organisations are publicly proclaiming the commercial benefits arising from the introduction of customer-focused teams, there are, in contrast, no examples that the writer could find of published research that used customer satisfaction as the (or even a) primary dependent variable in studies of the relationship between either HRM or BPR interventions and organisational performance. Issues of access and sensitivity are obviously contributory factors: researchers measure what they can. The overwhelming majority of quantitative studies of this kind therefore rely on accessible measures such as labour turnover, absenteeism, productivity, sales, safety and quality measurements. Although these measures are valid, they are only partially relevant in organisations and sectors where customer needs and expectations are driving contemporary business change. More methodologically and empirically rigorous research is required which tests the claims of both popular management gurus like Clutterbuck (1994) and the growing number of managers with responsibility for new organisational functions like customer services, quality, and communications that business process redesign (and indeed HRM) is predictive of enhanced customer value.

There is a strong relationship between the work organisation model of the Business Process Re-engineers and project team working. Project teams are, potentially, flexible and responsive organisational forms which exist to satisfy a particular customer or business need. Cleland (1992) argues that project teams enable an organisation to move product concepts through design, development, manufacturing and delivery to the customer in the shortest possible time, in a way which provides 'total customer satisfaction', and at the most competitive price (1992: 314-5). He also states that project teams can facilitate the international design of products, the use of strategic alliances and concurrent product and process design (Cleland, 1992: 315). Projects can be either open (unbounded) or closed (bounded). In construction, there is high potential for the project environment to interfere with planned progress, because the development process is extremely unstable. The role of the project team is to give the customer confidence that the end-product will satisfy his needs and expectations, by bringing order and predictability to chaos.

The methodology adopted in this study examined the predicted linkage between project team working and customer satisfaction in a large number of teams while controlling for the confounding effects of organisational culture. The results reported in chapter five and discussed in chapter six, however, indicate that team processes - as operationalised in the four-factor measure of team climate - are not predictive of customer satisfaction. There are two alternative explanations for this phenomenon. First of all, because the effectiveness of team processes is determined by how appropriate they are to the needs of the task, it may be impossible to apply a single climate model to different project environments. Or secondly, it is conceivable that effective team performance processes (and norms) in a construction project management environment are fundamentally different from those identified by Anderson and West (1992; 1994).

Some of the factors that do predict customer satisfaction in project teams are discussed elsewhere in this section. What seems clear, however, is that the determinants of customer satisfaction in a project environment are contingent upon myriad different factors, encompassing the client's own expectations, how she defines value and value-added, the nature of the project, boundary relationships with other participants in the development process (which will in turn be influenced by the form of contract), the efficacy of project management control systems, and so on. The relative weighting of these factors may also change during the project's life. Because of the uncertainties and vagaries of the customer satisfying process, it is important that the team can be close to the customer so that its members are able to respond to her changing needs in an accurate, sensitive and proactive way. The key is to work backwards from the identification of what is valued by the customer and to adopt methods of working that are appropriate. Insulating the team from the customer, or relying on performance norms that have proved successful in the past, may lead the team to apply inappropriate scripts to novel problems. The team leader must ensure that the team receives constant or regular feedback on its performance, allowing individual team members to adopt and practise behaviours that are germane to the task. This means that the team leader will need to possess diagnostic and adaptive skills, as well as the ability to turn analysis into practical outcomes.

7.3.2. Transformational Project Team Leadership

Team leaders create the climate in which their project teams operate and succeed as performing units. The five leader practices - inspiring, modelling, encouraging, challenging and enabling - represent a composite model of effective project leadership. Although excellent leaders do exist in traditional work systems, most supervisors and managers have been developed and rewarded for acting in a transactional way. These managers are typically unable to trust their subordinates because it presents a risk to task achievement and therefore to the satisfaction of their

own personal agendas (Kuhnert, 1994). Transformational leadership, on the other hand, transcends self-interest and is characterised by a concern with the long-term goals of the organisation, as well as with the individual needs of team members. Transformational leaders believe “that the needs of their teams are best served through the attainment of individual needs that serve worthwhile purposes” (Kuhnert, 1994: 24). The quantitative and qualitative results of this study suggest that transformational leadership in the context of project management has two dimensions:

- o Leadership practices (challenging, inspiring, enabling, modelling, encouraging)
- o Boundary management.

The leadership practices cause positive affective, climatic and performance outcomes. Setting an example for team members by behaving in ways that are consistent with stated values, standards and expectations helps to create a shared team vision and is also a determinant of individual job satisfaction. Challenging team members to innovate and improve the way that they work is intrinsically motivating. This loosely relates to goal-setting theories of motivation in the sense that the goal set by the team leader is to question ‘the way we do things around here’. Enabling leader practices - or the ability to get people to work together effectively by creating co-operative goals and sustaining trusting relationships - causes team members to communicate with each other and to share information.

In traditional thinking, project leadership would only be considered a design factor insofar as it involves structuring the activities of the team. Here, design is used in a broader sense, encompassing the structuring of tasks and processes, the establishment of appropriate group norms that regulate member behaviour, and the maintenance of an enabling performance environment throughout the team’s existence. It is true that modelling and envisioning are leader practices that are especially powerful during the team’s formative stages because they contribute to the norm creation and direction-

setting process. However, leadership can also be conceptualised as a process which flows through the team during its life-cycle, involving both transformational behaviours and functional activities.

At a functional level, and in the absence of a truly integrated multi-disciplinary team environment, the team leader must act as a conduit between the customer and the team, finding out what is important to the customer and then monitoring how her expectations change over time. The team is responsible for the production process within its boundary and will determine the method of working most suited to the needs of the project. If the team is working well and performance conditions are satisfactory, the team leader can focus attention on boundary issues, “such as interface problems with other teams, customer and vendor interactions, dealing with corporate groups, assessing competitors and market opportunities, working legal or community issues of importance, forecasting new technologies, building communication bridges with other groups, forging important alliances, bringing training and development opportunities into the team, and so forth” (Fisher, 1993: 124).

But if the team is not working well the team leader must also operate within the team’s boundary, not by directing and controlling the production process, but by ensuring that expert coaching and process assistance is available if it is needed (Hackman and Walton, 1986: 85). Because project management is a dynamic and evolving process, it is impossible to predict every new situation or problem that the team will face. The role of the team leader must therefore be to monitor the team’s performance conditions and, where necessary, to take action to create or maintain favourable performance conditions (Hackman and Walton, 1986: 89). This functional role, like the boundary management described above, is complementary (although different) to our five transformational leader practices: challenging, inspiring, enabling, modelling, and encouraging are not behaviours that are turned on

or off to suit situational exigencies; their power is based in how consistently they are practised (Kouzes and Posner, 1987: 18). Process assistance and coaching recognises that there will be peaks and troughs in the team's performance which may have a variety of causes and remedies. For example, does the team have sufficient skill and knowledge to deal with a particular problem? Does the team have access to all the information that it needs for the project? Are relations between certain team members hindering the team's performance? And so on.

In concluding this section, it is important that we emphasise the significance of the inspiring leader practice in the results. Its ability to predict a significant amount of the variation in customer satisfaction in the population of project teams is critical to our understanding of how high performance team systems can be created. Senge (1990) writes that "When you ask people about what is like being part of a great team, what is most striking is the meaningfulness of the experience. People talk about being part of something that is larger than themselves, of being connected, of being generative" (Senge, 1990: 13). Sometimes the project itself can create this feeling because of its significance. But this is rare. More often, construction projects are characterised by conflict and the pursuit of sectional interests. This is why the team leader is pivotal in generating a purpose which transcends the ordinariness of the task at hand and which can enlist the commitment of everyone in the project team throughout the development process.

7.3.3. Project Team Design 'Principles'

Conorg's project procedures manual identifies the importance of the project team formation and start-up phases: "the first six weeks or so of any new project are the most critical period, in that the relationships, management processes and procedures that are set up at this stage will live with the project throughout its duration" (1992: 62). The manual also states that the "most important single task of the newly formed

project team is the clear identification of the relationships and the roles that all of the players, both within [the case firm] and outside, have to perform on the project” (1992: 44). In terms of the organisation of the project, it is recommended that “the organisation will fall out naturally from the Package Procurement Strategy. On more complex projects, it will be necessary to adopt a more formal approach, in which the optimum organisational structure and associated management coding system are developed from the project Work Breakdown Structure” (1992: 51). The composition of each team is based upon six primary roles: project manager, construction manager, building services engineer, project planner, commercial manager and office manager. “[A]ll of the necessary Disciplines must be represented, and the Disciplines must work co-operatively, in such a way that the Construction, Project, Engineering and Commercial aspects of every Element of the project are dealt with in the most coherent manner possible” (1992: 51).

Three key team organisation ‘principles’ emerging from the results of this study are therefore present in the case firm’s procedures manual: clarification of roles, organisation of the team’s task and the selection of team members. In reality, however, the project design and start-up phases are seldom marked by this level of objectivity and sophistication. Team members are usually selected for teams as a result of their availability, not necessarily their suitability. Roles, relationships and responsibilities are imported into the new team environment from team members’ previous experiences. These previous experiences determine the way that team members work on the new project and also prescribe standards of behaviour and performance. The organisation structure, too, is replicated from project to project. This is because the prevailing project organisation structure tends to mirror the major functional roles in the case firm and the industry. The major issue to be decided is how many functional specialists the project’s budget can bear.

The team's organisation is therefore handled in a haphazard, subjective and spontaneous way. Once assembled the team is expected to function quickly as an effective performing unit. To some extent, the division of functional specialisms within the team and the highly proceduralised and routinised nature of the construction management process acts as a foil to the challenge of getting team members to work together in a creative and disciplined way. Procurement, planning and progress monitoring, cost control, scope and change control, information control, reporting and quality management are highly systemised and define the route that the project development process will follow. Unfortunately, because the work is so highly specified, this limits the potential and opportunity for value creation within the team and the project development process. This inflexibility suppresses the propensity for innovation which is revealed in the very low absolute score for support for innovation in the case firm. The results of this study suggest that the organisation design stage is an opportunity to create conditions for project team effectiveness and that the following factors should be considered as part of a managed design intervention:

3.3.1. Wherever possible, core teams should be kept intact from project to project. Although long tenure is not predictive of team climate or individual affective outcomes, it does affect the customer's perceived satisfaction with the project development process. We can suggest that this is because long tenure allows relationships to form and job-related learning to take place.

3.3.2. Where it is necessary to form new teams or to bring new individuals into an existing team, the team leader should focus on the knowledge and expertise that individuals bring rather than personal characteristics and team roles. Morley and Hosking (1992), for example, note how the relationship between long lists of personal characteristics and team performance fails to advance our understanding of the process of successful design. "We are simply left feeling that what is required is

some magical combination of personal qualities and individual skills” (Morley and Hosking, 1992: 11). More useful, perhaps, from a practical perspective is Tziner and Eden’s (1995) suggestion that team synergy is more likely to occur where members have uniformly high levels of competence, albeit recognising that they may be utilising that competence in the performance of tasks requiring different levels of ability.

3.3.3. The benefits of a clear engaging direction have been articulated by Hackman and Walton (1986) and supported by the results of this study. Where projects are highly complex shared vision can moderate the effects of that complexity. All team members should be involved in converting the team leader’s vision into specific, measurable, achievable, realistic and time-framed performance objectives. Participation in project planning and decision making can assist team members to develop a sense of ownership and commitment to project goals (Kezsbom, 1992).

3.3.4. A fundamental team organisation principle is that the team should be no larger than is absolutely necessary to execute the project. Larger teams are harder to work in and discourage communication. If this is impossible, however, because of the scale of the project, the team should be organised in a way that allows sub-teams to form and manage a complete part or phase of the project.

3.3.5. Although there is evidence only that composition predicts social desirability it is important that team members respect each others’ expertise and that the minimum skills complement needed to complete the project is present. The use of instruments like the Belbin (1981) Team Roles Inventory or Margerison and McCann’s (1997) Team Management Profile Questionnaire may help team members to gain a deeper insight into their shared strengths and weaknesses, but it is recommended that this is an intervention that *follows* selection, perhaps as part of a team development exercise (see below, section 3.3.7.). There is no conclusive evidence that the interpersonal

design boundary (Morley and Pugh, 1987; Morley, 1988) is significantly predictive of team performance. Further research is required to examine, and indeed specify, the relationship between balanced diversity of team roles and team outcomes.

3.3.6. The team leader should ensure that performance norms emerge within the team which reflect the character of the project and the needs and expectations of the customer. In bounded projects, time will always be an important factor, but other performance criteria may be valued by the client. This criteria may be different from work norms which were relevant in previous project settings. For example, the team's commitment to environmental or health and safety issues (important on rail projects, for example), or to the involvement of the local community in the project development process. In terms of the way work is performed, the team should agree on *what must always be done* and *what must never be done* in the project (Hackman, 1995). Where productivity is a key performance outcome, for example, the norm setting process should focus on the encouragement of constructive controversy and reflexivity.

3.3.7. Team development activities at the outset of the project can help to create an appropriate team climate but they must be focused on:

- establishing a clear understanding of the Client's objectives for the project within the team
- identifying or creating mechanisms which ensure that information on the team's performance is fed back into the team and then acted upon, monitored and reviewed
- creating awareness of each member's role in the team and the degree of task interdependency between roles, and then allowing the team discretion to make subsequent adjustments as a result of changes in customer needs and expectations

- encouraging communication and - where it is essential for the successful execution of the task - participative decision-making and co-operative working among team members
- developing the capacity to use constructive controversy “where critical review is seen as a healthy constructive process, rather than a destructive, aggressive conflict” (Anderson and West, 1994: 9) and people feel free to retract their views, restate them or move onto new positions when they have more information (Robinson, 1989). This is an important counter to groupthink (Janis, 1972) or non-vigilant information processing (Janis and Mann, 1977).
- dealing with those aspects of individual personality (e.g. arrogance or detachment) which might otherwise inhibit group working (Broadbent, 1988).

7.3.4. Managing Human Resources as Teams, as well as Individuals

The co-existence of production systems designed for work to take place in teams with organisations in which the culture and management style are individualistic in orientation (Hackman, 1990) and where personnel systems recognise and reward individual performance and contribution is presented as a paradox for Human Resource Management theory and practice (Legge, 1989). HRM is traditionally associated with the individual wage-relationship or psychological contract and with the performance and development of the organisation as a corporate entity. When academics and practitioners talk about human resources they are usually referring to individuals, not groups. There are two possible approaches to the reconciliation of this paradox. Firstly, organisations can reject the individualistic approach to the management of the employment relationship and develop new policies and practices which focus solely on team working in the belief that all organisational outcomes are interdependent. This approach is flawed, however, for the same reason that the individualistic approach is flawed: it fails to recognise the importance of diversity and the myriad different forms of individual and team contribution possible within

organisational settings. Or secondly, the organisation can adopt a contingency approach which recognises that some performance outcomes are a result of the interaction of several individuals, each of whom provide an equally weighted input; while other outcomes are a result of individual efforts or unique skills, knowledge, experience, often with an element of personal risk attached. Mahoney (1992) describes a scenario in a hypothetical environment where production tasks are organised into team assignments:

All members of a team will receive the same job base pay. Additionally, members will receive higher rates as they master more of the skills needed in the team. Team bonuses will be provided based on specific performance goals, which will change over time as attention shifts from quality to customer satisfaction or some other concern. A gainsharing formula may be established for an entire plant to encourage innovation and co-operation. And the budget for flexible benefits may be contingent upon tenure in the organisation” (Mahoney, 1992: 345).

The use of multiple pay contingencies in this way allows team-based organisations to reward individual, team and organisational performance in a way which recognises that there are no absolutes; in other words, that effective organisational performance is attributable to the contributions of both teams and individuals. Moreover, the reward and recognition of teams must be closely associated with a family of measures that focus on the satisfaction of customer needs and expectations.

The use of rewards in orienting teams towards higher levels of performance presents unique challenges and opportunities for HRM. But training is also important in creating a team performance orientation. Within Conorg, we have discussed in chapter three how the impact of a programme of ‘attitude’ training introduced in 1991 was bridled because it did not address intact work teams. Of course, there is a need to recognise that people have different identities, competencies, motivations and aspirations which can only be managed at an individual level. But training and

development which focuses on the growth of the individual and the organisation needs to be differentiated from that which focuses on improved team functioning. Hackman (1992) cites Line Oriented Flight Training (LOFT) as an excellent example of this latter training genre.

“In LOFT training, pilots operate as a real team in a setting that is uncanny in its realism - but that also provides a safe site for experimentation with new or unfamiliar behaviours. Video feedback, a key component of LOFT training, allows pilots to review their behaviour and to assess its effects on the crew and its work. Moreover, the instructor and the other crew members are in the same room during video playback, available to help each pilot explore the positive and negative effects of his or her behaviours” (Hackman, 1992: 5).

In developing the taxonomy of project team performance, it was hypothesised that an egalitarian approach to the treatment of employees was consistent with a team-oriented approach to HRM. The use of different titles and status within a team indicates to everyone a) that some team members are valued more highly than others and b) who has the authority to make the key decisions which affect the team's work. This is inconsistent with the team working principle that decision-making power should move among team members in a way which reflects individual knowledge and ability at different times during the team's life. For Lawler (1992), “[s]ymbols of office and hierarchy interfere with this type of decision-making because they signal levels in the hierarchy rather than signalling who has the knowledge and can best make the decision” (1992: 251).

Factor analysis, however, did not retain the two items which purported to measure the operational definition of team member equality in the new factor. The new factor loaded on four items which can orientate or reinforce team performance processes: training, rewards and information. This does not obviate the value of the equality

dimension. However, it does suggest that more research is required to examine how the various elements that fall within the domain of strategic human resource management (organisational and work structures, organisational cultures and personnel systems and practices (Salaman and Mabey, 1992: 1)) affect the performances of teams.

7.3.5. Issues of Transition and Sustainability

The results of this study confirm that an enabling team organisational environment - achieved through design - will have a positive effect on team climate, some aspects of project performance and team member job satisfaction and internal work motivation. The discussion in this chapter has further suggested that organisations should seek to maximise the benefits from team work designs by focusing on the enabling conditions, rather than trying to manipulate team processes directly. Some suggested strategies have been presented which may assist in designing high performing teams for projects. However, these strategies have been set within the context of a more critical approach to the team working model or ideal which suggests that the transition to a high performance team design is highly problematic.

The objective of this penultimate section is to examine how the results of this study might be used to smooth the transition from a project team-based organisation to a *high performance project team system*. The results clearly show that transformational leadership is key to the performance of project teams: leadership practices directly impact on the way customers perceive the performance of the project as well as contributing to the creation of a climate in which team members are encouraged to add demonstrable value to the project development process. In a devolved and decentralised organisation comprising many temporary and autonomous quasi-project organisations, the challenge is how to develop team leaders into transformational team leaders.

The design of high performing project teams and the creation of the conditions in which they continue to excel requires team leaders to develop and demonstrate a variety of attitudes and competencies which are different to traditional management styles. This mirrors a general trend away from management as a set of scientific, deterministic and mechanistic techniques to leadership as a multi-level process which is about the assembly and unleashing of human potential. The design of teams implies that team leaders have some functional activities, such as team member selection and the formation of a competent and 'balanced' team. Team leaders also need diagnostic and analytical skills which help them to be sensitive to the efficacy of group process. But fundamentally, they need to be able to get the best out of individuals by inspiring teamwork, creating a team identity, facilitating and supporting team decisions, challenging the status quo, giving meaningful performance feedback and recognising individual and team accomplishments regularly.

The absolute scores for each of the five leader practices showed that Conorg project managers were perceived to be less inspiring, challenging, enabling, modelling and encouraging than is typical in the normative population. Because of the correlation between these practices and desired team climate and organisational outcomes, it can be stated that a strategy designed to increase the presence of these practices among project managers will have a positive impact on the three important outcomes identified in this study: customer satisfaction, productivity and the capacity to moderate the effects of project complexity. In addition, there may a positive effect on other referent outcomes not included in this study, such as team innovation, problem solving and learning. But how is such a fundamental change in team leader attitudes and behaviour to be achieved?

The project managers in Conorg operate in a highly task-oriented work culture. Contractually-driven adversarialism, time and budget pressures and exacting clients combine to create an environment which perpetuates a reactive, functional and transactional management style. And, in addition to these cultural and contextual obstacles, there are also perceptual, emotional and cognitive blocks to change (Carnall, 1990: 37-41). These are more critical impediments to change because they are internalised. They build paradigms which create preferences for judging and rejecting rather than generating and exploring ideas. They create a self-image which is resistant to alternative modes of being and relating to others.

One way of gaining commitment from people to change is to reveal to them how their own self-image compares with the perceptions of others around them. 360° feedback is a potential stimulus to personal change. The results in chapter four demonstrated that the self-perceptions of project managers concerning their leadership practices in Conorg were far more positive than those of their team members. Holding up a mirror to project managers which reflects the gap between their self-image and the image of those whom they are leading *may* have a powerful effect, particularly if it is reinforced by coaching. But the effect will not be the same for all project managers. Some will listen and reflect; others will not. Some will welcome the opportunity to revive dormant values and behaviours; others will become defensive and hostile. There are as many likely responses as there are project managers within the organisation. Covey (1992) argues that “although it is very difficult to adapt or change our style, it’s not impossible. Our leadership style can be ‘situational’, but before we’re able to make a change, we may require new mentors or models” (1992: 169).

The importance of a shift in the attitudes and behaviours of senior management is instrumental. Empty platitudes about teamwork, integrity and empowerment will not win the commitment of the workforce nor legitimise the intended changes unless

actively and visibly modelled by senior managers. This is the pre-condition to a package of coherent and integrated HR interventions which should include the articulation of a corporate vision which describes what is meant by a high performance team organisation *in practice*, business process examination and possibly redesign, effective and continuous communication highlighting progress and successes, training in self-awareness and personal growth together with some of the more tangible skills of transformational leadership, contingent rewards which reinforce the new behaviours and competences, and the fair and effective management of those who are 'losers' in the transition or who are unable to make the personal transition at any level.

7.4. Conclusion

This chapter has sought to challenge the popular notion of team working as an unproblematic remedy to fluid markets, international competition, exacting customer demands and rising employee expectations of their work and careers. Building on the results of the multivariate analysis in chapter four which failed to confirm the predicted relationships between a positive team climate and customer satisfaction, project income, job satisfaction and internal work motivation, we have explored six possible reasons why teams may fail to deliver the expected performances. Central to the developing argument has been the difficulty in isolating the key processes or norms which are antecedent to the different performance expectations required by clients.

In chapter one we examined the post-modernist formulation that changes in consumption, culture and organisation constitute a decisive break from Weberian bureaucracy and industrialism (Clegg, 1990). Post-modernism is said to mark a new epoch in the evolution of organisation structures in which we find niche-based marketing strategies co-existing with new forms of work organisation based on multi-

skilled team working (Piore and Sabel, 1984; Hirst and Zeitlin, 1991). Although it may be naive to accept Hammer and Champy's 'pop-management' (Thompson, 1993) assertion that, "[t]here is no longer any such notion as the customer; there is only this customer, the one with whom a seller is dealing at the moment and who has now the capacity to indulge his or her own personal tastes" (1993: 18), there is a general acceptance among academics and practitioners that patterns of consumption have altered in many industries. As a response to what has become, for many firms, a crisis, teams are being introduced into the labour process as a way to enhance the valorisation process, whether in design, engineering, manufacture or sales. But, as we have seen, the re-organisation of the labour process alone is insufficient to ensure new levels of organisational performance. The team is simply a work organisation *design choice*; it is not necessarily imbued with more creative or productive powers than traditional work designed for individuals working in chains of compartmentalised functions. The great potential power of teams may be realised by accident. But, more usually, "one must actually build a team. Calling a set of people a team or exhorting them to work together is insufficient. Instead, explicit action must be taken..." (Hackman, 1990: 494).

Using teams for one-off products or projects has a long history, but is even more problematic, given the temporal nature of the development process. Project teams only exist to serve a specific customer need or to address an organisational goal. In a construction project-organisation like Conorg, a project team's existence is defined by a client's need for a construction-related service. When formed, the team's ability to satisfy or surpass customer expectations depends upon its ability to develop performance processes which are appropriate. Evidence from Conorg and elsewhere (e.g. Hackman et al, 1990) indicates that these processes do not automatically engage when a group of people are brought together. However, it does suggest that the point at which the team's existence is physically defined - i.e. between securing the order for the customer's project and the physical initiation of that project - is a critical area

of intervention which can influence subsequent performance and, perhaps also, the customer's decision to repeat purchase. This process is shown diagrammatically in figure 7.1. below.

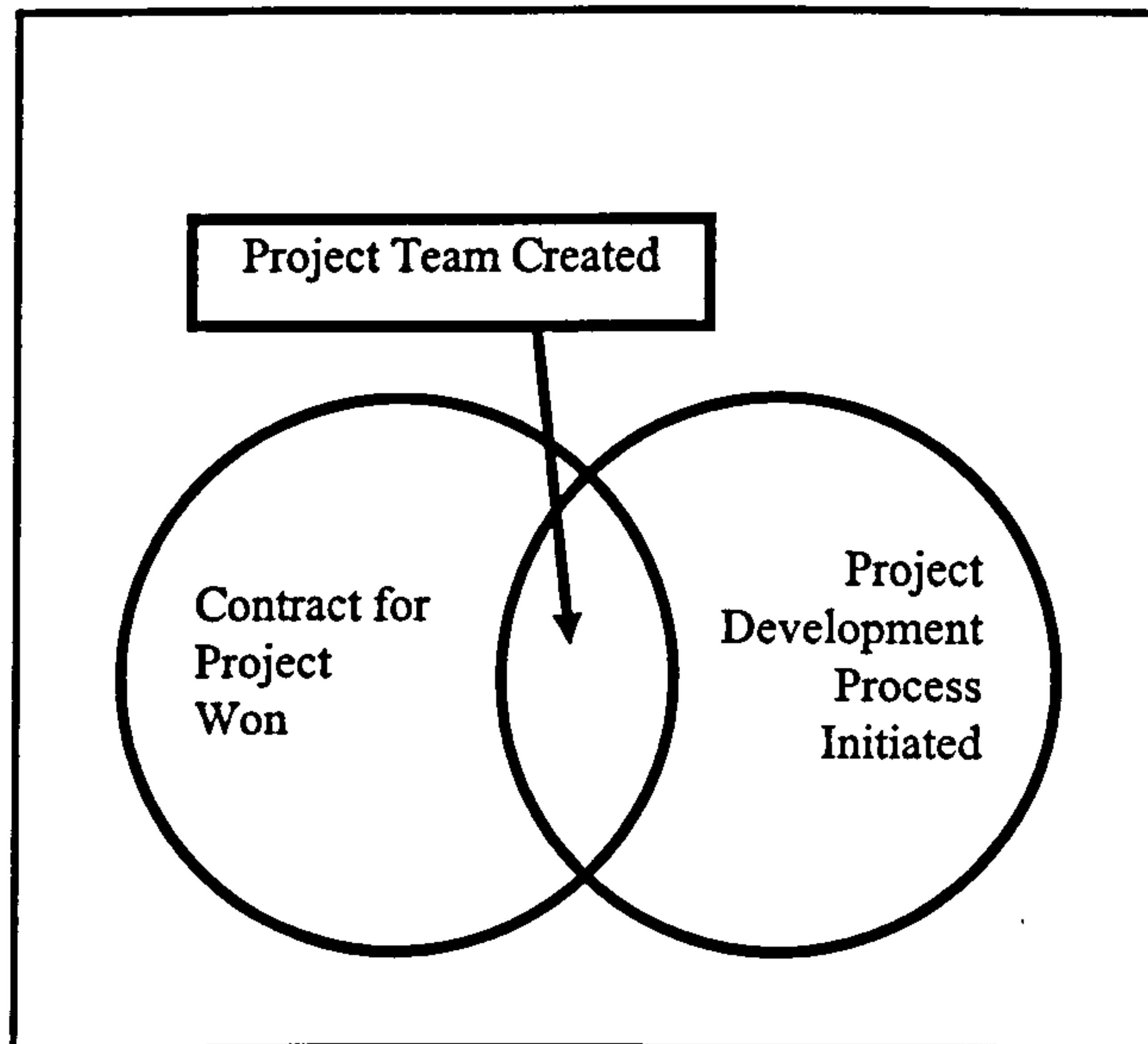


Figure 7.1: Point of Intervention for Team Design in a Project Management Context

Both the pop-management literature on teams and the sales literature produced by management consultants who claim expertise in team building rightly state that team performance (and indeed team member satisfaction) is dependent upon the presence of appropriate performance conditions. However, the popular literature typically adopts a non-specific approach to the identification and description of these conditions. With the exception of a small body of work dominated by Hackman, Goodman, Guzzo, McGrath and a few others, there has been little research which has tried to isolate the key predictors of real team performances. This study has sought to extend knowledge and understanding of the factors which explain different team performances. Its conclusion is that team environments - or climates - must be consciously and pro-actively designed to undertake projects, and that organisations can apply considerable leverage through the use of customer-focused team design, transformational leadership practices, team organisation design principles and the

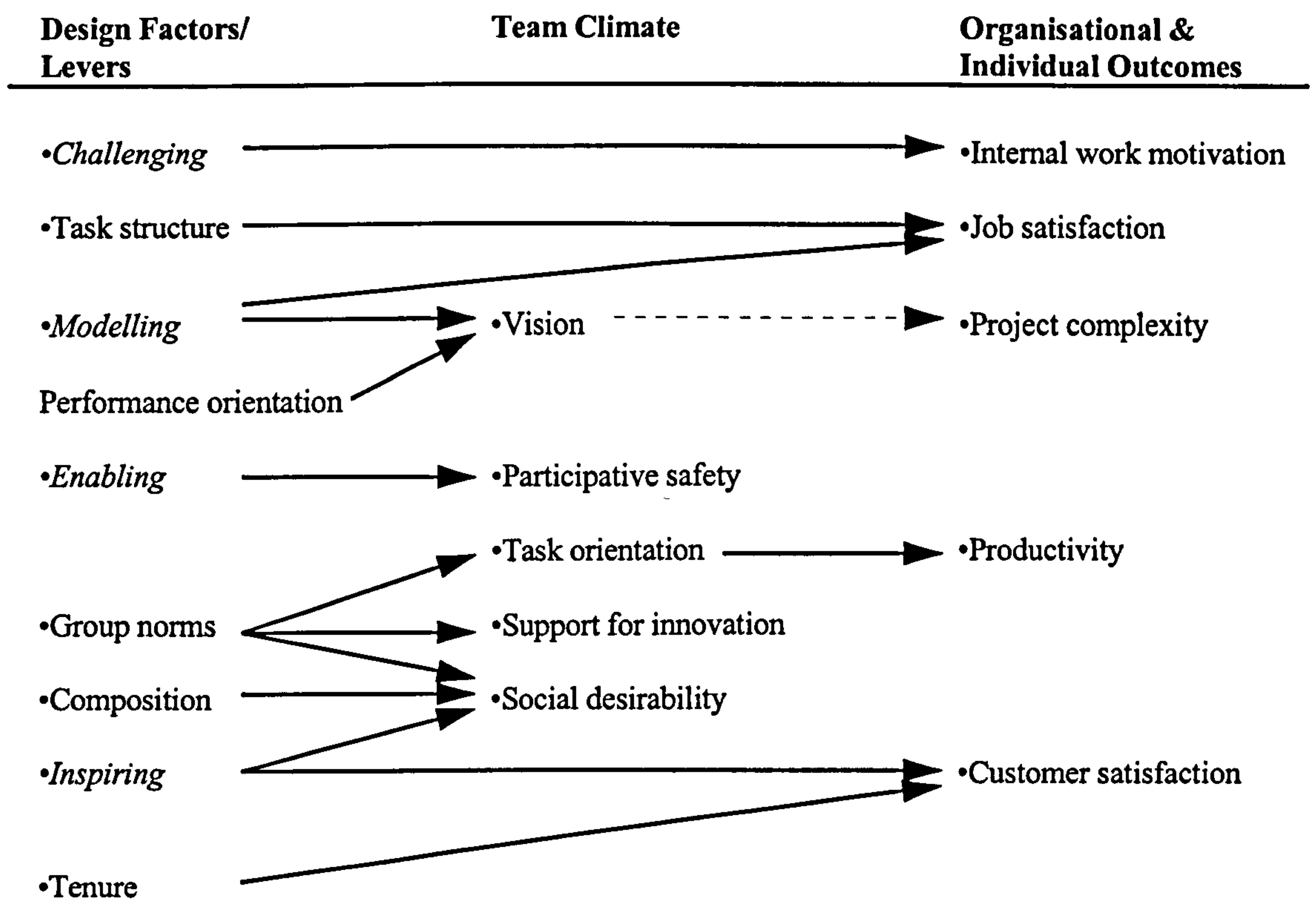
8.0. CONCLUSION

8.1. Introduction

This study developed from a desire to isolate the key contributory factors that explain the different performances of construction project teams. It was grounded in the writer's exposure to a change initiative within his employing organisation and the evolution of this experience into a theory about how work design might be applied to the team creation process. From the outset, it was anticipated that the study would extend our understanding of the determinants of the different performances of real work teams - specifically project teams - engaged in complex tasks. This might subsequently provide the basis from which to develop a methodology for improving the actual performance of Conorg's construction project teams and, by implication, other project teams engaged in similarly complex tasks. This concluding chapter will discuss whether or not this outcome has been realised.

8.2. Determinants of Real Team Performances

The multi-variable, open-systems model developed in chapter three and tested in chapter five sought to identify the performance antecedents of a large sample of project teams while controlling for the confounding effects of organisational culture. The inclusion of multiple variables in the model provided an opportunity to isolate some of the key predictors of team performance. A summary of the most significant of these causal relationships is presented in figure 8.1. overleaf.



Leadership Practices are italicised
 - - - - - = moderated relationship

Figure 8.1: Significant Causal Relationships between Predictor and Criterion Variables in the Taxonomy of High Performance Project Team Design

Although these relationships are, in themselves, interesting and have been discussed in chapters five and six, it is appropriate now to draw some conclusions and propose a structure which may be of use to future researchers and practitioners. In chapter seven, five team design strategies were suggested which emerged from the results of the empirical investigation. These were: customer-focused team design, the application of project team organisation ‘principles’, transformational project team leadership, managing human resources as teams as well as individuals, and issues of transition and sustainability. Whilst these strategies support some recent pop-management prescriptions, such as the Business Process Re-engineering (BPR) notion that existing work organisation configurations should be re-engineered to connect customers with production and labour processes, they also form the basis of

an empirically tested and normative model which is relevant to, and generalisable within, contemporary project management organisations.

Arguably, project management is different to other processes of value creation. The ability to effectively identify, define and then control the key processes which contribute to the direct satisfaction of customers in the project environment is subject to considerable unpredictability. Projects are fluid and experience continuous change as they unfold towards a solution that (hopefully) meets the objectives of the client or sponsor. The type of intellectual team working which is present in a successful project does not involve the linear passage of an element of work from one team member to another in the way that a car, for example, is manufactured in an assembly plant. Processes of problem solving, learning, reflexivity and creativity are more iterative and gradual. Project teams must develop performance strategies and solutions which are suited to a customer's requirements for a specific project. Although the results of this study show that perceived project complexity is mediated by shared objectives, and task orientation is reasonably predictive of productivity, the results did not indicate that Anderson and West's (1994) generic model of team climate was predictive of customer satisfaction or income in the population of 49 project teams. Whilst this challenges academic and other attempts to define best practice models of team process, it does not necessarily mean that team processes themselves fail to predict desired outcomes. What it suggests is that the norms and processes that predict performances in specific project environments are myriad and not easily subject to detection by instruments that claim universal sensitivity and application. This leads us to conclude that organisations should focus on creating an environment in which referent norms and processes that *are relevant* to the performance needs of the task are allowed to emerge and develop.

Many projects require short term bursts of focused energy from the teams engaged to execute them. But because every project is different it is crucial that the right team

performance norms and processes emerge and are engaged. The call to 'start out right' is frequently heard but seldom extends from the technical planning of the project (work breakdown structures, scheduling, cost planning etc.) to the creation of enabling conditions which help the team realise its potential and thus produce outstanding, value-adding performances for its customers. Keeping teams together can speed learning on new projects, but the team leader must still ensure that norms form and processes emerge that are relevant to the task; past scripts imported from relationships with previous client and other organisations may be inappropriate and even obstructive in new situations. Because of the fluidity, turbulence and finite nature of project work, teams will tend to be reconstituted as old projects terminate and new projects commence. As suggested at the close of chapter seven, the team formation and project start-up phases are the point at which the active intervention of the team leader is critical. The results of this study - from the literature, the multivariate analysis of the 49 teams and the interviews with team leaders - suggest that leverage may be applied at three levels to create an environment which will increase the likelihood of project team success. Each of these levels will be considered in turn.

8.2.1. Level One: Corporate Human Resource Management

The first level of intervention is that of corporate Human Resource Management (HRM) policies and practices and concerns the creation of a context within the parent organisation which is oriented towards high performance project team working. This is the most difficult level to address but, arguably, the most critical. The model of high performance project team working presented in chapter three isolated *team orientation* as a possible predictor of team climate and the results confirmed that the variable was highly predictive of shared vision. Following factor analysis, the team orientation variable was refined and subsequently defined as a combination of three processes which orient the team towards high performance: feedback, training and

rewards. Managing customer feedback can be organised by the team leader locally. However, resources for team training and team reward are usually accessed from outside the team's boundary. If HRM policies and practices are based on the satisfaction of individual needs or the achievement of wider corporate goals, this may mean that additional resources are unavailable for use by team leaders. It is therefore recommended that team-based organisations consider deploying a proportion of their training budgets for use by team leaders (for team development and just-in-time specialist training, for example), and that possibilities for gain-sharing or other ways of rewarding teams for the collective performance of team members are explored. However, it will probably be necessary to introduce control mechanisms which ensure that these scarce resources are effectively directed towards the creation of shared objectives and outcome interdependence.

In addition to HRM policies and procedures which facilitate team performance orientation, we might also suggest that the degree of fit between the skills, attitudes, knowledge and experience of the team's members and the needs of the project can and will be influenced by the parent organisation. In Conorg, this influence emanates from both the Personnel function and the business centres, while in some organisations sophisticated competency tracking and matching systems are in use. Although the results of this study indicate only that a causal relationship exists between group composition and social desirability, it would be presumptuous and naive to conclude from this that team membership has no effect at all on team performance. We have seen in chapter four that the 49 Conorg projects differ widely in their relative complexities. It is therefore important that there is a minimum level of collective technical competence present which will enable the team to achieve its task. In addition, and although the validity of team-type indicators like Belbin's (1981) Team Role Self-Perception Inventory in designing and/or strengthening teams is in doubt, it is important that the membership is diverse enough to enrich the team's problem-solving and creative processes (Chemers, Oskamp and Constanzo, 1995),

and that the team appreciates its strengths and can compensate for its limitations (Morley and Hosking, 1992: 15).

Level one is also important because it is the source of the organisation's culture and values. At the centre exists a web of cultural norms which determine what is acceptable and unacceptable practice. This percolates down and influences the behaviour of people throughout the organisation. Culture was not a primary unit of analysis in this study but its effects are important because of the role of change management in the transition to a high performance project team system and its subsequent sustainability. The model presented in this study challenges some existing assumptions about the antecedents of team effectiveness. Schein (1992) suggests that "one of the crucial functions of leadership is to provide guidance at precisely those times when habitual ways of doing things no longer work, or when a dramatic change in the environment requires new responses" (1992: 244). Thus we can suggest that during the transition to a high performance team system, the role of corporate leadership is critical in modelling the new behaviours and thereby supporting the learning process. Certainly, it would be anomalous if the senior management team itself was not generally perceived to be a high performing team.

8.2.2. Level Two: Designing the Project Team

The second level of intervention is the physical design of the project team's environment and the creation of project-specific conditions (or a climate) in which the team is more likely to achieve its performance potential. During this stage, the primary activity of the team leader should be to create a vision for the project which is sufficiently powerful to bind all of the participants to it. In major projects, the project itself can often provide a vision that is intrinsically powerful, but this will not always be the case. Some projects generate more enthusiasm, motivation and commitment than others. The example of Joe Saltzer, a cleaner working for NASA

in 1968 is symptomatic: “When asked by a visitor what he did, he replied, ‘I’m helping to put a man on the moon’” (Blessing/White, 1995). Managing the construction of another supermarket may not engender this kind of enthusiasm or excitement among participants (including the sponsor). However, creating a vision which challenges the participants to see their work in a more appealing and unifying way can create a context in which the whole team produces an outstanding performance. The vision can be much more than the architect’s drawings, but it requires imagination and involvement. Techniques of visual imaging may be useful in helping the team to construct a novel understanding of, and role for, their new project and the part that they, as individuals, play in its realisation (Morgan, 1986; 1993). Morgan’s (1986) “*what if...?*” methodology might be useful here. For example, *what if* we think about this project as ‘the first of its kind’, or as ‘an opportunity to experiment’, or as ‘an example of how it should always be done’, and so on. This is a fundamentally different approach from traditional approaches to team building which attempt to speed the relationship-building process, often using external consultants whose presence can prevent the team leader from taking centre-stage in the vision building process. It also provides an opportunity to instil norms about how the team can add value to the development process beyond the usual and more limited emphasis on on-time, within-budget, task completion.

If the team leader is able to create a vision which extends the team’s task beyond the ordinary, the conditions are in place for the team to exceed its physical goals and move to higher levels of performance. Inspiring a shared vision is the centre-piece in the project team’s architecture because it is a significant antecedent of customer satisfaction. But there are some other practical team organisation ‘principles’ which can help the team develop appropriate performance norms and processes. These ‘principles’ flow from, and reinforce, the vision. For example, team members may need initial help in clarifying what tasks, activities and behaviours are necessary in working towards the vision. Some specialist training may be required if a knowledge

gap becomes evident in the team. If the project team is very large, careful organisational structuring might be necessary. Certain performance norms may need to be clarified and agreed upon: for example, if team members have joined a new project with a very different project work culture from their previous experiences. And so on. A programme of team development can assist in these level two activities, but must be carefully designed and implemented. The team leader should play the principal role in this programme and a single 'team building' event is unlikely to be sufficient (Buller, 1986). A more effective approach will involve several inter-related activities which focus on, perhaps, envisioning using the visual imagery approach describe above; agreement of appropriate norms including, for example, how customer feedback will be channelled into the team and the acceptability of constructive controversy within the team; the use of meetings with individual team members to clarify roles and personal goals and the team leader's expectations; and training in team problem-solving methods. Team development is therefore presented as a multi-faceted and on-going level two design intervention which equips teams - primarily in a self-directed way - with the necessary capabilities and processes to deal with the uncertainty of the project environment throughout its life-cycle.

8.2.3. Level Three: Transformational Team Leadership

The third and final level of intervention moves beyond the organisational context and the team's design stage to the on-going maintenance of a performance, value and satisfaction-enhancing climate within the team. This requires that the team leader continues to demonstrate the transformational leadership practices which are essential to team performance and the maintenance of a positive team climate: enabling, challenging, modelling and encouraging. All but the encouraging leader practice are predictive of facets of team climate, of social desirability, and of the two affective outcomes, job satisfaction and internal work motivation. Teams and projects grow

and change throughout their life-cycle. The damage that can be inflicted by the unexpected, unthinking or malicious actions of third parties is a constant threat to the delicate fabric of the team's architecture, but the team can be strengthened by leaders who search for challenging opportunities to change, grow, innovate and improve, who envision the future and enlist others in their vision, who foster collaboration by promoting co-operative goals and building trust, who strengthen others by sharing information and power, who set an example which is consistent with their stated values, who plan small wins that promote consistent progress and build commitment, and who recognise individual contributions and celebrate team accomplishments regularly (Kouzes and Posner, 1987; 1990).

Moreover, the team leader should be able to effectively diagnose the performance condition of the team in real time and to take appropriate remedial action where necessary (Hackman and Walton, 1986: 107-109). In practice, the leader may feel it necessary to adopt a situational approach and select alternative behaviours depending upon his diagnosis. For example, are there problems in team members ability to work independently and is it necessary to encourage greater co-operation? Are certain individuals insufficiently motivated and need challenging? Is everyone clear about what the team is working to achieve? Does the team need additional skills to achieve its task? Is the client satisfied with the results of the team's work? And so on. Transformational leadership is therefore the active and *perpetual* ingredient which ensures that the benefits of a supportive organisational context and an effective team organisation climate-design are maintained throughout the team's existence.

A diagrammatic representation of the three levels is presented in figure 8.2. overleaf in relation to the creation of the antecedent conditions that it is suggested are required to achieve exceptional team performances. Customer satisfaction has been isolated as the principal referent outcome because of its relationship with team leadership practices in the project management environment. In effect, the diagram models the

internal 'fit' between a combination of HRM practices at different levels in the organisation and the performance of the project team (Guest, 1996).

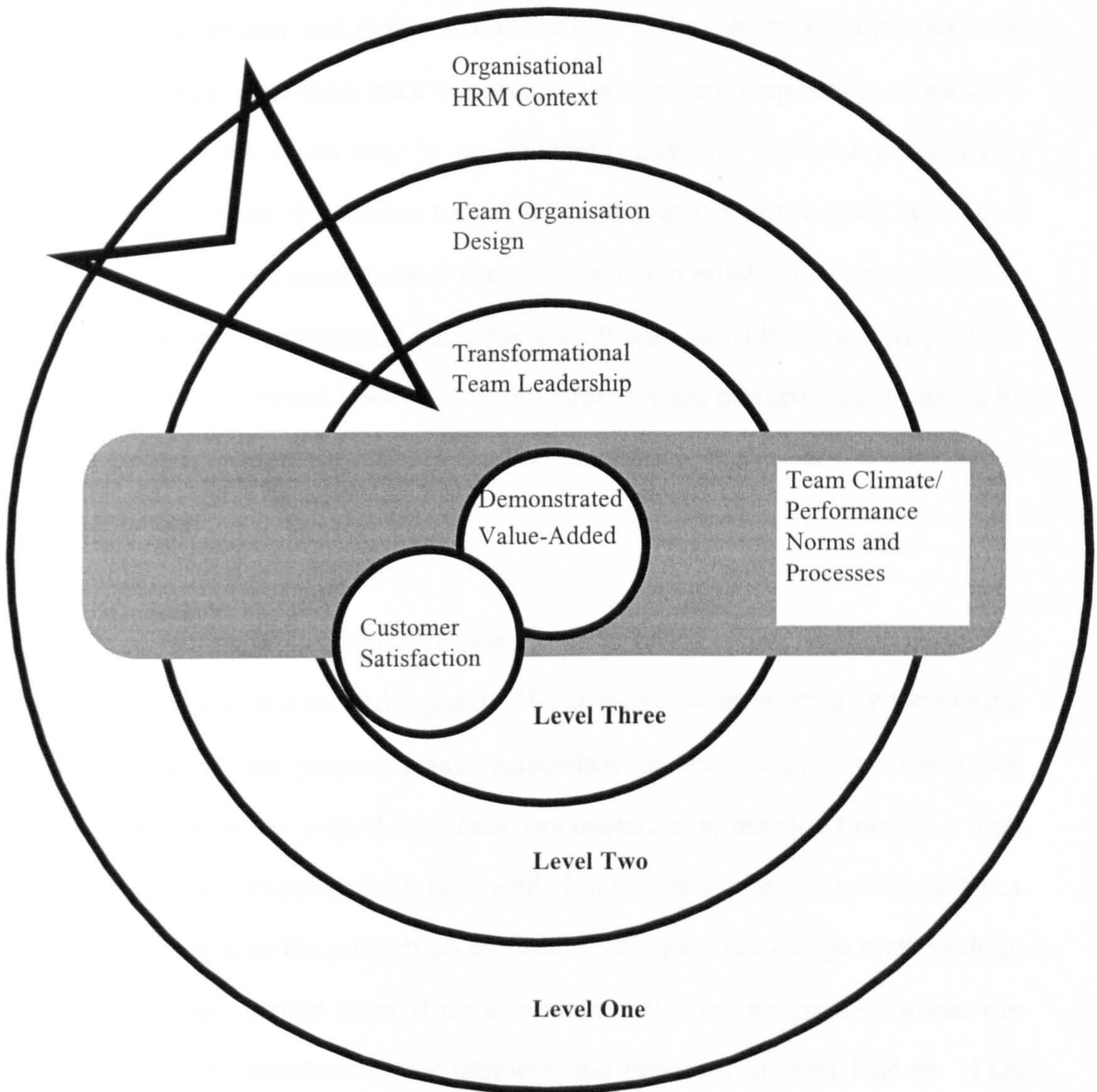


Figure 8.2: Normative Model of High Performance Project Team Design

This normative model represents a preliminary attempt to synthesise some existing approaches in the hitherto unrelated small groups and HRM literatures in order to enhance our understanding of the determinants of superior project team performances. Benefiting from an unusually high degree of access within the case firm, the study has considered the impact of a large number of design variables on

three outcomes that are critical to the performance of many organisations: customer satisfaction, productivity and income. The study has controlled for the confounding effects of the organisation's culture and identified some significant relationships between the independent and dependent variables. It has discussed the results of these findings and related them back to previous theories and empiricism. Finally, it has presented a model which may be useful to organisations whose core activity is the project management of complex tasks. It is anticipated that the study will be of interest to academics and practitioners who seek valid and reliable evidence about the effects of HRM on organisational performance. It also provides some support for Guest's 'fit as gestalt' model (1996: 11) in that project team performance seems to be dependent upon a combination of policies and practices operating at different levels in the organisation.

At the time of writing, it is considered that the three levels of intervention described above do not co-exist as a unified, 'gestalt' HR strategy for improving or facilitating the performance of the project teams researched in this study. However, an opportunity does exist for project-orientated organisations to develop towards a high performance team-orientation which is grounded in corporate values and HR policies and practices, fused with the production process by using a work design methodology which generates appropriate team climates and performance norms, and given life and perpetuity in the transformational attitudes and practices of team leaders. This requires a considerable change in much current thinking and policy. At its core is the need for the team to be treated as the primary human resource, albeit one that draws on the skills, knowledge, attitudes and experience of diverse individuals. It also requires significant investment in, for example, the development of a user-friendly work design methodology and a major programme of training for team leaders. It is argued that this could provide a practical example of how an internally consistent and integrated package of multi-level HRM policies and practices can positively impact on project team performances. It may also show how, in project management at least,

innovation in approaches to the management of the human resource may also translate into innovation in the product or service-value provided to customers.

Finally, if client needs continue to become yet more diverse, demanding and unpredictable, the ability to assemble teams that are capable of adding exceptional value to the development of one-off projects will become more important. Greater attention will be paid to the ability of teams composed of outstanding individuals to deliver innovation, productivity, quality, speed, profitability and, at its core, added value and total customer satisfaction. Where customers demand unique solutions to complex projects, the ability to create teams that are willing and able to generate these performances is a core organisational competence. However, attempting to specify and define the key causal influences on group effectiveness in this kind of fluid environment is extremely difficult. Groups can reach the same outcome using a variety of performance strategies. “There is no single strategy that will work equally well for different groups, even groups that have identical official tasks” (Hackman and Walton, 1986: 80). The successful management of client projects therefore requires that considerable effort is directed towards designing teams for high performance. Specifically, team performance-oriented HRM practices, team organisation design and transformational leadership development, are levers which can assist in the creation of climate-conditions for outstanding project team performances.

APPENDICES.

APPENDIX A: TEAM MEMBER QUESTIONNAIRE

TEAM PERFORMANCE INVENTORY

INSTRUCTIONS

This questionnaire asks about the different characteristics of your team. It asks about the leadership practices of the team's project manager, how people tend to work together in your team, the team's aims and objectives, how much practical support and assistance is given towards the implementation of new and improved ways of doing things, the way in which your project team's task is organised, and your satisfaction with the work that you do.

The questionnaire typically takes between 15 and 20 minutes to complete. There are no 'right' or 'wrong' answers to any of the questions - it is more important that you give an accurate and honest response to each question. Do not spend too long on any one question. First reactions are usually best. For each question circle the *one* response that reflects *how you feel in general* about your team.

As you can see from the final section you have not been asked for your name. But because we want to compare the characteristics of different teams in your company it is very important that you give the project information that is asked for (so all of the responses from team members on the same project can be grouped together). Please note that the presentation of the results *will not reveal the identity of individual teams*.

Leadership Practices

To what extent would you say your [Conorg] team leader engages in the following actions and behaviours. Circle the one number that applies to each statement.

(Note: if you are the team leader please respond by describing your own behaviour.)

1	2	3	4	5
Rarely or very seldom	Once in a while	Sometimes	Fairly often	Very frequently or almost always

He or she:

- | | | | | | | |
|----|---|---|---|---|---|---|
| 1 | Seeks out challenging opportunities that test his or her skills and abilities | 1 | 2 | 3 | 4 | 5 |
| 2 | Describes the kind of future he or she would like for us to create together | 1 | 2 | 3 | 4 | 5 |
| 3 | Involves others in planning the actions that will be taken | 1 | 2 | 3 | 4 | 5 |
| 4 | Is clear about his or her own philosophy of leadership | 1 | 2 | 3 | 4 | 5 |
| 5 | Takes the time to celebrate accomplishments when project milestones are reached | 1 | 2 | 3 | 4 | 5 |
| 6 | Stays up to date on the most recent developments affecting our organisation | 1 | 2 | 3 | 4 | 5 |
| 7 | Appeals to others to share his or her dream of the future as their own | 1 | 2 | 3 | 4 | 5 |
| 8 | Treats others with dignity and respect | 1 | 2 | 3 | 4 | 5 |
| 9 | Makes certain that the projects he or she leads are broken down into manageable steps | 1 | 2 | 3 | 4 | 5 |
| 10 | Makes sure that people are recognised for their contributions to the success of our projects | 1 | 2 | 3 | 4 | 5 |
| 11 | Challenges the way we do things at work | 1 | 2 | 3 | 4 | 5 |
| 12 | Clearly communicates a positive and hopeful outlook for the future of our organisation | 1 | 2 | 3 | 4 | 5 |
| 13 | Gives people a lot of discretion to make their own decisions | 1 | 2 | 3 | 4 | 5 |
| 14 | Spends time and energy making certain that people adhere to the values that have been agreed upon | 1 | 2 | 3 | 4 | 5 |
| 15 | Praises people for a job well done | 1 | 2 | 3 | 4 | 5 |
| 16 | Looks for innovative ways we can improve what we do in this organisation | 1 | 2 | 3 | 4 | 5 |

1	2	3	4	5
Rarely or very seldom	Once in a while	Sometimes	Fairly often	Very frequently or almost always

He or she:

17	Shows others how their long-term future interests can be realised by enlisting in a common vision	1	2	3	4	5
18	Develops co-operative relationships with the people he or she works with	1	2	3	4	5
19	Lets others know his or her beliefs on how to best run the organisation he or she leads	1	2	3	4	5
20	Gives the members of the team lots of appreciation and support for their contributions	1	2	3	4	5
21	Asks "What can we learn?" when things do not go as expected	1	2	3	4	5
22	Looks ahead and forecasts what he or she expects the future to be like	1	2	3	4	5
23	Creates an atmosphere of mutual trust in the projects he or she leads	1	2	3	4	5
24	Is consistent in practising the values he or she espouses	1	2	3	4	5
25	Finds ways to celebrate accomplishments	1	2	3	4	5
26	Experiments and takes risks with new approaches to his or her work even when there is a chance of failure	1	2	3	4	5
27	Is contagiously excited and enthusiastic about future possibilities	1	2	3	4	5
28	Gets others to feel a sense of ownership for the projects they work on	1	2	3	4	5
29	Makes sure the team sets clear goals, makes plans, and establishes milestones for the projects he or she leads	1	2	3	4	5
30	Makes it a point to tell the rest of the organisation about the good work done by his or her team	1	2	3	4	5

Communication and Innovation

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1 We share information generally in the team rather than keeping it to ourselves	1	2	3	4	5
2 Assistance in developing new ideas is readily available	1	2	3	4	5
3 We all influence each other	1	2	3	4	5
4 The team always functions to the best of its capability	1	2	3	4	5
5 We keep in regular contact with each other	1	2	3	4	5
6 In this team we take the time needed to develop new ideas	1	2	3	4	5
7 People feel understood and accepted by each other	1	2	3	4	5
8 Everyone's view is listened to, even if it is in a minority	1	2	3	4	5
9 People in the team never feel tense with one another	1	2	3	4	5
10 The team is open and responsive to change	1	2	3	4	5
11 People in the team co-operate in order to help develop and apply new ideas	1	2	3	4	5
12 Being part of this team is the most important thing at work for team members	1	2	3	4	5
13 We have a "we are in it together" attitude	1	2	3	4	5
14 We interact frequently	1	2	3	4	5
15 The team is significantly better than any other in its field	1	2	3	4	5
16 People keep each other informed about work-related issues in the team	1	2	3	4	5
17 Members of the team provide and share resources to help in the application of new ideas	1	2	3	4	5
18 There are consistently harmonious relationships between people in the team	1	2	3	4	5
19 There is a lot of give and take	1	2	3	4	5
20 We keep in touch with each other as a team	1	2	3	4	5
21 People in this team are always searching for fresh, new ways of looking at problems	1	2	3	4	5

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
22 The team consistently achieves the highest targets with ease	1	2	3	4	5
23 There are real attempts to share information throughout the team	1	2	3	4	5
24 This team is always moving towards the development of new answers	1	2	3	4	5
25 Team members provide practical support for new ideas and their application	1	2	3	4	5
26 Members of the team meet frequently to talk both formally and informally	1	2	3	4	5

Objectives

	Not at all		Somewhat		Completely
1 How clear are you about what your team's objectives are?	1	2	3	4	5
2 To what extent do you think they are useful and appropriate objectives?	1	2	3	4	5
3 How far are you in agreement with these objectives?	1	2	3	4	5
4 To what extent do you think other team members agree with these objectives?	1	2	3	4	5
5 To what extent do you think your team's objectives are clearly understood by other members of the team?	1	2	3	4	5
6 To what extent do you think your team's objectives can actually be achieved?	1	2	3	4	5
7 How worthwhile do you think these objectives are to you?	1	2	3	4	5
8 How worthwhile do you think these objectives are to the organisation?	1	2	3	4	5
9 How worthwhile do you think these objectives are to the wider society?	1	2	3	4	5
10 To what extent do you think these objectives are realistic and can be attained?	1	2	3	4	5
11 To what extent do you think members of your team are committed to these objectives?	1	2	3	4	5

Task Style

	To a very little extent		To some extent		To a very great extent
1 Do your team colleagues provide useful ideas and practical help to enable you to do the job to the best of your ability?	1	2	3	4	5
2 Do you and your colleagues monitor each other so as to maintain a higher standard of work?	1	2	3	4	5
3 Are team members prepared to question the basis of what the team is doing?	1	2	3	4	5
4 Does the team critically appraise potential weaknesses in what it is doing in order to achieve the best possible outcome?	1	2	3	4	5
5 Do members of the team build on each other's ideas in order to achieve the best possible outcome?	1	2	3	4	5
6 Is there a real concern among team members that the team should achieve the highest standards of performance?	1	2	3	4	5
7 Does the team have clear criteria which members try to meet in order to achieve excellence as a team?	1	2	3	4	5

Task Structure

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1 Our team has worked together long enough for us to develop into a real team	1	2	3	4	5
2 It is easy for our team to tell whether it is doing a good job or a bad job	1	2	3	4	5
3 Our work is so cut and dried that team members have little chance to make decisions about how they do it	1	2	3	4	5
4 Our team has clear standards, or rules of conduct, for the behaviour of its members	1	2	3	4	5
5 Our task is not really very significant in the broader scheme of things	1	2	3	4	5
6 Our team has people with the right mix of complementary skills to do its work well	1	2	3	4	5
7 Our team merely carries out work; other people in the organisation decide what is to be done and how it is to be done	1	2	3	4	5
8 Our task is engaging and involving	1	2	3	4	5

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
9 Standards of behaviour in the team are so unclear that there is a lot of "jockeying" for position among individuals	1	2	3	4	5
10 The work our team does is meaningful and important	1	2	3	4	5
11 It is clear in our team what is acceptable behaviour and what is not acceptable	1	2	3	4	5
12 For some of our tasks our team never finds out how well we have performed	1	2	3	4	5
13 Individual roles in our team are clearly understood by everyone - members know what they are expected to do and they do it	1	2	3	4	5
14 Our team has the authority to manage its work much the way members want to	1	2	3	4	5
15 The way our task is set up makes it hard for team members to generate much excitement about doing it	1	2	3	4	5
16 Some people in our team do not have enough knowledge or skill to do their part of the task well	1	2	3	4	5
17 The work we do is challenging requiring use of a number of high level skills	1	2	3	4	5
18 Lots of people let us know what they think of our performance as a team	1	2	3	4	5
19 There is a great deal of room for initiative and judgement in the work we do	1	2	3	4	5
20 Certain individuals in our team are not able to work well within a team	1	2	3	4	5
21 What people in our team expect other team members to do seems to change from minute to minute	1	2	3	4	5
22 Most of the tasks that we do in this team are quite simple and repetitive	1	2	3	4	5
23 Members of our team have ample experience and expertise for doing the work	1	2	3	4	5
24 Changes in the make-up of teams occur so often in this organisation that project managers do not have the opportunity to get really comfortable with the team they are working with on a particular project	1	2	3	4	5
25 The size of our team is just right	1	2	3	4	5
26 The people in our team are a good mix	1	2	3	4	5

Team Orientation

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
In this team:					
1 Expertise is emphasised over status or position	1	2	3	4	5
2 The reward system creates a strong incentive for effective team working	1	2	3	4	5
3 Training is available to help us work well as a team	1	2	3	4	5
4 Good team performance pays off	1	2	3	4	5
5 There are obvious status differences between individual team members	1	2	3	4	5
6 We have been trained to use our strengths to the benefit of the team	1	2	3	4	5

Job Satisfaction

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1 My opinion of myself goes up when I do this job well	1	2	3	4	5
2 Generally speaking I am very satisfied with this job	1	2	3	4	5
3 I feel bad and unhappy when I discover that I have performed less well than I should have on this job	1	2	3	4	5
4 I frequently think of quitting this job	1	2	3	4	5
5 My own feelings generally are not affected much one way or the other by how well I perform this job	1	2	3	4	5
6 I am generally satisfied with the kind of work I do in this job	1	2	3	4	5
7 I feel a great sense of personal satisfaction when I do this job well	1	2	3	4	5

APPENDIX B: LETTER INTRODUCING QUESTIONNAIRE

Open Business School

**David Asch
Dean**

September 1994

Dear respondent

Questionnaire Survey

I am writing to you to ask if you would be willing to take part in a research project by spending about 15 minutes of your time to complete the enclosed questionnaire.

The questionnaire is a very important part of an investigation into the performance of construction teams. The aim of the research is to try to identify the factors which have the biggest impact on the success or failure of different projects. The questionnaire looks at subjects like leadership, the 'climate' or atmosphere in your team, the mix of team members, and job satisfaction.

Your responses will be treated in the strictest confidence and individual responses will not be identified. The focus of this research is on the team.

When you have completed the questionnaire please would you return it to me in the stamped addressed envelope provided.

Finally, if you were among the hundred or so people who participated in a pilot study for this project last year it would be greatly appreciated if you could still complete and return this questionnaire which is different from the earlier version.

Thank you very much for your time and your co-operation.

Sincerely,

Mark Jenner
Researcher

APPENDIX C: LETTER OF SUPPORT FROM CONORG

Conorg

6 September 1994

Dear Colleague,

Although Mark Jenner is employed by [Conorg], for the purpose of this exercise he is an independent researcher carrying out post-graduate studies with the Open University's School of Management.

We recognise the value of this research and support Mark fully in this project. I would therefore ask you to take a little of your time to complete the enclosed questionnaire and return it to Mark within the next few days.

With many thanks.

Your sincerely

Director Human Resources

APPENDIX D: FOLLOW-UP LETTER (TEAM MEMBERS)

28 September 1994

Dear Respondent

Questionnaire Survey: Team Performance Inventory

Just a quick note to thank those of you who took the time to complete and return my questionnaire. So far I have received 142 questionnaires covering 39 teams. This is from a total of 403 questionnaires sent out to 49 [Conorg] teams. A breakdown of the responses by team is attached.

The development and distribution of the questionnaire was the culmination of almost three years work, most of which took place in my time. The success of the project - which I hop to complete by the end of 1995 - depends on getting a good response rate to the survey (something in excess of 50% of the questionnaires returned with a minimum of two questionnaires from each of the 49 teams). I would therefore be extremely grateful if those of you who have not yet completed the questionnaire could take a few minutes to do so for me.

If you have mislaid the questionnaire please give me a call [in Conorg's Head Office] and I will be pleased to send you a copy.

Thank you once again for helping me.

Sincerely,

Mark

n.b. If as a team you would like some feedback on these results please let me know and I will arrange something.

APPENDIX E: CUSTOMER SATISFACTION QUESTIONNAIRE

INSTRUCTIONS

This questionnaire asks about the performance of the [Conorg] team that you are *the*, or a, principal customer for. It contains three sections which ask you for your assessment of the team's performance.

The questionnaire should take about five minutes to complete. There are no 'right' or 'wrong' answers to any of the questions - it is more important that you give an accurate and honest response to each question. Do not spend too long on any one question. First reactions are usually best. For each question circle the *one* response that reflects *how you feel in general* about the team.

If you have any questions or would like to find out more about this research project please feel free to contact Mark Jenner on [telephone number].

Thank you very much for your time and your help.

Customer Satisfaction

For each item below please indicate your level of satisfaction with the team's performance:

	Poor Performance		Average Performance		Outstanding Performance
1 Clear understanding of your commercial issues	1	2	3	4	5
2 Knowledge of your industry	1	2	3	4	5
3 Sensitivity to your business and management culture	1	2	3	4	5
4 Up-to-date knowledge of relevant technical issues	1	2	3	4	5
5 Timely identification of key issues	1	2	3	4	5
6 Innovative advice and creative solutions	1	2	3	4	5
7 Contribution to your business goals	1	2	3	4	5
8 Independence of opinions and objectivity	1	2	3	4	5
9 How well the team works with you	1	2	3	4	5
10 Accessibility of the team leader	1	2	3	4	5
11 Accessibility of team members	1	2	3	4	5
12 Response to your needs and requirements	1	2	3	4	5
13 Regular and proactive contact by the team	1	2	3	4	5
14 Promptness in responding to calls and correspondence	1	2	3	4	5
15 Clarity of presentations, meetings and written reports	1	2	3	4	5
16 Overall performance of the team	1	2	3	4	5

Project Performance

Please indicate the extent to which each of the statements below applies to the results of the team's project:

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
1 The project will be delivered on time	1	2	3	4	5
2 The project will be delivered in budget	1	2	3	4	5
3 The project will work and represents the best solution, given constraints	1	2	3	4	5
4 The results of the project will represent a definite improvement in the way activities are performed	1	2	3	4	5
5 Users will be satisfied with the results of the project	1	2	3	4	5
6 Users will be able to use the results of the project immediately	1	2	3	4	5
7 Users will benefit directly from the results of the project	1	2	3	4	5

Project Profile

Please use the scale below to identify the main features or characteristics of the team's project:

1	Significance to your business	Marginal	1	2	3	4	5	Core
2	Solution	Familiar	1	2	3	4	5	Novel
3	Pace	Gradual	1	2	3	4	5	Rapid
4	Intentions	Uncontroversial	1	2	3	4	5	Controversial
5	Changing goals	Rare/minor	1	2	3	4	5	Often/major
6	Client position	Supportive	1	2	3	4	5	Unsupportive
7	Outside links	Few	1	2	3	4	5	Many
8	Sense of ownership by all participants	High	1	2	3	4	5	Low

Project Information

1 What is your name?

2 What is your address?

Telephone:

3 What is your relationship with the team?

4 What is the name and address of the project to which the responses in this questionnaire relate?

5 What is the name of the [Conorg] project manager?

6 What is the team's purpose or goal?

Thank you very much for your help and co-operation in this project. Please would you now return the questionnaire in the stamped addressed envelope provided.

**APPENDIX F: LETTER INTRODUCING CUSTOMER SATISFACTION
QUESTIONNAIRE**

Dear Mr [Name of Project Client/Sponsor]

Project Name

I am a part-time PhD student employed full-time by [Conorg]. I am conducting research into the factors within teams that affect the performance of those teams. This research is being carried out under the supervision of the Open University's Business School, and with the full support of my employer, [Conorg].

I have just completed a survey of 49 teams of 400 [Conorg] personnel to establish individual and team perceptions of factors like the leadership style of the [Conorg] project manager, the 'climate' or atmosphere in the team, the mix of team members, and job satisfaction. What I want to do now is to investigate whether or not there is a cause-and-effect relationship between these factors and the *performance* of the teams.

I would therefore be grateful if you could complete and return the enclosed questionnaire for me in the stamped addressed envelope provided. This is a confidential survey and the results *will not be communicated* to your [Conorg] team unless you specifically ask me to do so.

I believe that the results of this study will increase our understanding of the characteristics within teams which have the biggest impact on their performance. This will help us to better 'design' teams to improve the quality of service delivered to project sponsors.

If you would like to discuss any aspect of this research in more detail please give me a call on [telephone number].

Thank you very much for helping me.

Sincerely,

Mark Jenner
Researcher

APPENDIX G: FOLLOW-UP LETTER (CUSTOMERS)

Dear Mr [Name of Project Client/Sponsor]

Project Name

I am writing to follow-up my recent letter which asked if you would be so kind as to complete and return a confidential customer satisfaction questionnaire for me. This is an important part of a doctoral research project that I am carrying out with the full support of my employer, [Conorg].

Although most surveys can survive on a response rate of around 50% it is very important for this research that I get as close to a 100% return as possible. This is because I need to establish the *relative* performances of all the teams that I have surveyed.

I have attached a breakdown of the number of responses received from team members (the column marked 'frequency') together with responses from the teams' customers. So far 243 [Conorg] team members have replied from a total of 400 questionnaires distributed (@60%), while a little under half of the teams' customers have so far replied.

At the time of writing I have not yet received your questionnaire and I am therefore writing to ask if you would take a few minutes of your time to do this for me. You will appreciate that one questionnaire returned from a team's customer is worth about four returned from team members!

Thank you very much for helping me with this project.

Sincerely

Mark Jenner
Researcher

enclosed: Team Performance Inventory (Customer Survey)
Stamped Addressed Envelope
Summary of responses

APPENDIX H: LETTER TO TEAM LEADERS CONCERNING INTERVIEW

Conorg Internal Memorandum

To: Team Leader
From: Mark Jenner
Date:
Subject: *Factors Affecting the Performance of Project Teams*

I am now coming to the end of my research project which has looked at the factors which account for the differences in the performance of [Conorg] project teams.

As well as sending questionnaires to [Conorg] team leaders and team members I also managed to get three measures of project performance for the teams: client satisfaction, productivity and income on turnover.

Of the 49 teams for which I have performance information, your team was one of the [number] teams that achieved the highest ranking on the [customer satisfaction/productivity/income] indicator.

I have obviously come to some of my own conclusions concerning the factors which have the biggest impact on the way that a team performs. What I would like now is *your view* on why you believe your team achieved this high level of performance.

The best way to get this information is by short interview. This will probably take no longer than one hour. Perhaps you could ring me sometime within the next two weeks to arrange a time that is convenient for you.

Two questions that you might like to consider before we talk are:

- What factors led to the high level of [customer satisfaction/productivity/income] on your project? Here, for example, you might include factors such as relationships with the client/professionals/trade contractors/others; the type of project; the quality and mix of your team members and how they worked together; the way you led and organised your team, and so on.
- Did the project experience any turning points and/or critical incidents that made it a success? You may want to focus on when these incidents took place; who was involved; why things were different afterwards, etc.

Thank you very much for your continuing help with this project. I look forward to speaking to you soon.

Mark

***APPENDIX I: APPLYING THEORY - DESIGNING TEAMS FOR PROJECTS IN
CONORG?***

This study concluded by arguing that project teams may be given an improved chance of achieving high performance by applying leverage at three levels: corporate HRM, team organisation design, and transformational team leadership. The study began, however, with the idea that work design techniques could be applied within Conorg and that this would lead to improved team and organisational performance. This appendix will briefly review the recent situation in the case firm and suggest some opportunities for the implementation of the normative model of high performance project team design.

Although Conorg did not place any obstacles in the way of this research, and actively supported the writing up process by providing the author with time away from work, little direct interest has been shown in the content of this study. This follows a similar pattern to other dissertations and reports carried out in the Company. For his part, the author has not actively communicated the results of the study, justifying this on the grounds that he will do so when the study has concluded. However, he had tried to introduce some of the ideas into the organisation within his own area of influence, specifically in education and development programmes. This is most clearly revealed in the content of the Management of People module of Conorg's in-house Masters degree in Construction Management.

In terms of level two team organisation design interventions, the education and development function has supported project managers who want to use team development activities at the beginning of new projects. However, these are ad hoc and tend to be led by external consultants who have little or no ownership of subsequent events. A Project Quality Planning methodology - essentially a project start-up process - was developed by the Continuous Improvement group in 1992/93, but this is not widely used. Two submissions to potential clients early in 1996 did include sections based on the model developed in this study, but it is unclear whether or not the recommendations were subsequently implemented. Team members have

always been selected on the basis of their technical expertise (and availability), although actual project organisation structures and working practices tend to compartmentalise the different specialisms. Conorg also pursues an informal policy of splitting up project teams, helping to overcome 'group-think' and insularity, but perhaps losing the benefits of group learning and the maintenance of social processes which support disciplined and productive work.

Corporate HRM policies and procedures, or level one activities, are directed towards the performance and development of individuals and the organisation as a whole, not project teams. The reward system, for example, gives merit awards and bonuses to individuals. A widely held criticism of a major organisational change programme between 1991-93 was that individuals were 'cherry-picked' for training from their teams, and on return were faced with an unchanged work environment making it extremely difficult to apply new learning. Other training programmes follow a similar pattern: training is seldom available to facilitate whole team performances (as advocated by Hackman (1992), for example).

Although team leadership skills are taught on several programmes, project manager development is primarily a function or result of experiential learning, and this is invariably a product of the environment in which these experiences take place. In 1996, managers on a Team Leader Development Programme were introduced to a videotape of Kouzes and Posner's five leader practices (Kouzes and Posner, 1990). The reaction was generally positive, although participants found it difficult to reconcile these practices with the practical *requirement* to display technical competence. However, it should also be noted that of the 18 project managers selected to attend, only six started the programme. Although reasons for non-attendance varied, the managers generally felt that they already possessed the skills being taught.

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