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**Skills Supply Strategy  
in Large High Technology Organisations**

by

**Rolland LeBrasseur**

**Dissertation submitted for the degree of Doctor  
of Philosophy to the University of Warwick  
Warwick Business School**

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## ABBREVIATIONS

ADBU	Air Traffic Control BU
ASD	Applications & Services Development Directorate
BC	Business Communications Division
BT	British Telecom plc
BU	Business Unit
CISBU	Communications & Information Systems BU
CM	Civilian (Personnel) Management within MOD
DRA	Defence Research Agency
DTI	Department of Trade & Industry
ECBU	Electronic Components BU
EEC	European Economic Commission
ELM	External Labour Market
EOBU	Electro-Optics BU
HR	Human Resources
HRM	Human Resource Management
HSO	High Scientific Officer
ILM	Internal Labour Market
IM	Individual Merit Scientist
ISD	Information Systems Development Directorate
ISSBU	Integrated Surveillance Systems BU
IT	Information Technology
MEBU	Micro-Electronics BU
MOD	Ministry of Defence
MPG	Managerial and Professional Grades
NT	Network Technology Directorate
OFTEL	Office of Telecommunications
PCG	Personal Contract Grades

<b>PM</b>	<b>Package Management</b>
<b>PPB</b>	<b>Personnel Policy Board</b>
<b>PRP</b>	<b>Performance Related Pay</b>
<b>PSO</b>	<b>Principal Scientific Officer (Grade 7)</b>
<b>R&amp;D</b>	<b>Research and Development</b>
<b>RE</b>	<b>Research Establishment</b>
<b>RSRE</b>	<b>Royal Signals and Radar Establishment</b>
<b>SKISS</b>	<b>Skills Supply Strategy</b>
<b>SMG</b>	<b>Senior Management Grades</b>
<b>SO</b>	<b>Scientific Officer (Grade 9)</b>
<b>SPSO</b>	<b>Senior Principal Scientific Officer (Grade 6); also called Superintendent</b>
<b>SSO</b>	<b>Senior Scientific Officer (Grade 8)</b>
<b>Super</b>	<b>Superintendent</b>
<b>TELCO</b>	<b>Telecommunication Company</b>
<b>WN</b>	<b>Worldwide Networks Division</b>

## SUMMARY OF THE RESEARCH

This thesis pursued three objectives: (1) to identify policies and practices which are related to the retention of professionals and managers with critical skills; (2) to document why and how these policies and practices have changed in relation to the business strategy; and (3) to assess whether the organisation's skill supply patterns constitute a strategy, that is, explicit, consistent and coordinated efforts supporting the business strategy. Guided by a contextual theoretical framework and methodology, the researcher undertook a pilot study of two Canadian high technology firms, and followed with three case studies of large UK-based high technology organisations with an R&D Division.

The findings indicated the importance of hard benefits (compensation) as a necessary condition for recruitment and retention, and the complementary impact of twelve soft benefits (job characteristics and other factors tied to the work, organisational and social environments) with special relevance for retention. Lifetime employment as a policy and as the dominant skills supply pattern proved to be resistant to change. The HRM context (comprising the history of the organisation, managerial and professional cultures, the personnel function, and workforce planning) was found to inhibit skill initiatives, but certain features became less negative over time. In particular, the cumulative effect of recruitment of new skills over several years altered the internal labour market such that many employees supported new ways of doing business.

Skills were found to be solidly embedded in the work and social organisation, and high levels of energy were required to modify the organisation-wide skillbase. Both single lever and multiple lever SKISSs were identified. Middle managers proved to be potential key actors in obtaining skill advantages for the entire R&D Division. Top management paid attention to skill issues under extreme circumstances such as a shift from the public to private sector, and a change of mission. The thesis leads to a number of policy recommendations and avenues for future research.



## **CHAPTER 1: INTRODUCTION**

The importance of knowledge and technology in economic activity has grown steadily in the industrialised countries since the Second World War. The pace of creation of new knowledge and its applications has increased dramatically and exponentially. As part of this general trend, organisations have recruited, in ever larger numbers, highly educated and specialised individuals, the so-called knowledge workers. Entire industries centred on technology have been created, such as electronics, computing and telecommunications, and recently have been merging into a larger information technology or IT industry. Knowledge workers represent a significant proportion of their workforce. In large organisations, entire divisions have been created specialising in research and development (R&D). Similarly, within the public sector wartime laboratories have been expanded to support the national defence industry.

As markets have become international and competition has sharpened, technology has become a strategic weapon. Knowledge workers have become important throughout the economy as all industries are pursuing R&D and seeking technological applications to improve products and services for customers. Improvements in internal operations, notably manufacturing and work systems, are also sought with vigour. The demand for these workers, and managers of these workers, has stretched the labour markets since the 1970s, and skill shortages have become chronic. The literature has documented these environmental changes, but less attention has been given to how organisations have adapted their people management practices to achieve business goals. The strategic aspect of human resource management (HRM) beckons for investigation.



Presently there exists little empirical work on the recruitment of knowledge workers, and even less on their retention. That which exists has generally been too narrow in scope, divorcing the individual from the organisational context or treating the organisation as an indivisible whole. Most studies have been static in nature, examining the situation at one point in time through, for example, surveys and present-oriented interviews. Yet life as we all experience it remains a complex phenomenon which alters dynamically and which is influenced by the past. A change-oriented HRM study of knowledge workers would be timely.

High technology organisations are intensive users of knowledge workers. Their products and services depend in large measure on the expertise and the innovativeness of their employees, and on the employees of their business partners, usually other high technology firms. These same knowledge workers constitute the labour pool for group leaders and first-line managers. The careful management of both workers and their managers in terms of recruitment, development, and retention can contribute to maintaining the firm's competitive advantage. In the last decade, the literature on HRM has become abundant, but only a small portion has covered the high technology organisation or the topic of skill supply pattern. The extent to which these firms achieve strategic HRM remains an empirical question. What kind of skill supply patterns have evolved, and to what extent have they supported the changing business strategy? What were the retention mechanisms operating, and how were they used and modified to ensure the supply of key skills over time?

The computing and telecommunications segments of the IT industry in England have a number of large firms such as IBM, Digital, and BT. All of them have extensive R&D facilities populated by large numbers of knowledge workers. Lifetime employment was offered with an attractive package of monetary and work-related rewards including the social and physical environments. However,

the 1980s and the 1990s have witnessed important industry changes. With rising competition among the large firms and the remarkable success of small entrepreneurial "niche" firms, the large firms have come to question the contribution of these knowledge workers. With the recession of 1990-1992, retrenchment became the industry norm. At the same time, the public sector was undergoing the Thatcher revolution of budget cutbacks, and was becoming more like the private sector. This current of change affected the defence industry and the R&D activity within government organisations. New ways of doing business were required, and expectations of employees were changing. How did this re-evaluation of the contribution of knowledge workers evolve in the private and public sectors, and how was it influenced by the environment? How did these organisations modify their skill supply policies and practices within this changing context? How did the various rewards act as retention mechanisms, and were changes in rewards appropriate to the business requirements?

## **A CONTEXTUALIST APPROACH TO ORGANISATIONAL RESEARCH**

In order to undertake a study that is broad in scope and that captures changing events and circumstances, a framework is needed that guides the researcher's efforts. Without a framework, such a complex study would be weighed down by the profusion of data, and the researcher would experience both exhaustion and bewilderment. The contextual approach facilitates the task at hand. This framework focuses on the content of change (WHAT), the process of change (HOW), and the context of change (WHY). It permits multi-level analysis by situating change within different contexts: the individual within the group or department, the group within the department, the department within the division, the division or function within the organisation, the organisation within the environment. This categorisation of contexts is neither definitive nor exhaustive,



but demonstrates the point. As an organisational study, our focus is intermediate, recognising the full spectrum of levels of analysis, but treating the micro and macro levels as information that clarifies and situates events and issues taking place at the focal level. A contextual study of skills supply strategy or SKISS can make a significant contribution to the academic knowledge base of strategic HRM. It will help fill the gap on the management of knowledge workers in high technology organisations, a preoccupation of the 1990s.

## **RESEARCH OBJECTIVES**

The purpose of this dissertation is that of theory building, not theory testing. The relative lack of empirical change-oriented work on strategic HRM and the management of knowledge workers creates a weak foundation upon which to test theory. At this stage of knowledge construction, it would be more appropriate to adopt a research framework (contextualism), borrow key concepts from the strategic management literature (emergent, intended and deliberate strategies), and begin to create the longitudinal empirical foundation from which grounded change theory can be constructed. Future researchers then would be in a position to add to this foundation and begin testing the new theory. This researcher has assumed some risk in doing so in that his theoretical contribution remains uncertain because the nature of the phenomenon being studied (skill supply strategy) may prove to be elusive or fragmentary.

As part of this process, this researcher has redefined the research objectives in light of the data collected. With changes in the economic environment in the late 1980s (from expansion to contraction), my focus on skills retention was broadened to skills supply strategy with retention mechanisms including release schemes and

operating along with recruitment and development activities. The dissertation consequently came to pursue four research objectives:

to identify human resource management (hrm) policies and practices, and organisational characteristics which are related to the recruitment and retention of key groups of employees, namely professionals and managers, in large high technology organisations;

to document why and how these organisations come to have such policies, practices and characteristics, their importance to the success of the business strategy, and the adjustments that took place with the changing business strategy;

to assess the organisation's skill supply pattern and determine whether it constitutes a strategy (linkage with the business strategy, managerial intent, coherence of HRM elements, and consistent efforts over time); and

to interpret these findings in light of the pertinent academic literature and construct a model to guide future research.

## **STRUCTURE OF THE DISSERTATION**

The dissertation is organised into nine chapters that can be grouped into four sections. The first three chapters situate the reader. The general introduction (Chapter 1) is followed by a literature review on the key concepts of skills, skills supply strategy, retention and commitment, and hard and soft benefits (Chapter 2). The next chapter discusses the research process and methodology, both as a craft and academic process, and presents the lessons gleaned from the pilot project (Chapter 3). The resulting classification of hard and soft benefits is applied, in a static manner, to the case material of this dissertation.

The second section is composed of three data chapters, each one a case study of a large high technology organisation operating in England: IBM United Kingdom Holdings Limited or IBM-UK (Chapter 4); British Telecom, otherwise known as



BT plc (Chapter 5); and RSRE or Royal Signals Radar Establishment which became a division of the Defence Agency in 1992 (Chapter 6). The R&D division constitutes the main object of study in IBM and BT, while all of RSRE equates to the same unit. Each case reviews the history of the organisation and its environment, the changing business strategy and the organisational structure, and the management style and general culture. This sets the stage for the presentation of the skill supply pattern and the larger HRM context. Changes in hard and soft benefits are documented and explained. The case ends by examining whether the business strategy was supported by the skill supply pattern, and how the HRM culture facilitated or hindered the latter.

The next section of the dissertation has two analytic chapters which compare and contrast the case studies. What were the skill supply patterns identified, and can any pattern pass the "test" for strategic HRM? What is the influence of embedded skills on SKISS (Chapter 7)? What features in the inner context of the organisation influenced the management of skill supply? How has the broader HRM context acted as a facilitator or obstacle to changes in skill supply patterns (Chapter 8)?

The dissertation concludes with Chapter 9, a summary of the main conclusions and a discussion of issues raised. A revised model of SKISS is presented. The theoretical and empirical contributions to the academic field are noted. Finally, policy recommendations are made, and the outstanding research questions are described.

In summary, this dissertation will argue that SKISS is a useful concept for studying the relationship between critical skills for business success and the business strategy. SKISS disentangles the management of skills from the broader concept of HRM, and raises the question of receptivity of the HRM context to skill



supply initiatives. The empirical data base of the thesis will help to understand the nature of skills from the management perspective. It will document the process of change whereby a skills supply pattern comes about and is modified over time, and the impact of the organisational and wider context. A classification of hard and soft benefits, and packages of benefits for recruitment and retention purposes will be created. How these packages are modified over time and their retention impact will be analysed and situated within the overall skills supply pattern operating in the organisation. Finally, the thesis will evaluate the findings in light of the strategic management literature, and assess whether the skill supply patterns qualify as strategy. Policy recommendations for practicing managers will be offered. A model summarizing the findings will be presented as a guide for future research.

## **CHAPTER 2: CONCEPTUAL FOUNDATIONS & THEORETICAL PERSPECTIVES**

### **INTRODUCTION**

The purpose of this chapter is to present the conceptual and theoretical foundations of the thesis. The chapter begins with a broad review of the literature on skills, and follows with the new concept of SKISS within the evolving HRM and strategic literature. Next, the concept of skill is defined within the organisational context, expanded into the idea of a skillbase, and linked to the main concepts of SKISS and retention mechanisms. Thereafter, an organisational model of SKISS is elaborated and discussed in terms of ILMs and the flexible firm. The chapter ends with a focus on skill supply patterns in large organisations operating in the IT sector. A brief summary concludes the chapter.

### **DEFINING SKILLS**

The Concise Oxford Dictionary defines skill as expertness, practised ability, a facility in action. The complete Oxford Dictionary refers to skill as the ability to use one's knowledge effectively. Stated otherwise, frequent application of one's knowledge and ability leads to skill in the task at hand. Engineering skill has been defined as performance that integrates knowledge of resources and restraints (tools, techniques and situation), planning skills (interpreting requirements, generating and evaluating ideas, and choosing the best approach), and manual skills (Engineering Industry Training Board, 1980). With an interest in technological change, Rolfe (1990) defined technical skill in terms of two job dimensions: technical complexity and discretion. The first dimension refers to complexity of tasks (techniques and dexterity), knowledge (general and specific to

the job), and range and variety of tasks. The second includes decision-making and judgement over the process or product, control over the organisation of work, and supervision. Other professions share this emphasis on knowledge, problem-solving and design (Schon, 1983) with varying levels of manual skills required. Conceptual or intellectual skills play a large role in the sciences and in computer-related work where professionals manipulate conceptual representations. Gardner (1983) has identified six types of intellectual competencies which combine to form patterns or skills: linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, and personal.

Within an organisation, these technical skills are accompanied by interpersonal and managerial skills. Interpersonal skills are present in any human discourse and interaction: listening, expressing, explaining, sympathising, exchanging, helping and cooperating (Cohen et al., 1980). Hosking (1988) and Kotter (1982) emphasised the managerial skills of networking, negotiating and influencing others, and interpreting internal and external corporate events. Zuboff (1988) identified knowledge and intellectual skills as additional requirements for middle managers dealing with analytical and routine activities. We conclude that technical, conceptual, interpersonal and managerial skills exist within any organisation. The proportion and types of specific skills required vary across professional and managerial positions in response to vertical and horizontal work organisation (Shenhar and Thamhain, 1994; Griffin, 1987; Boyatzis, 1982; Katz, 1974).

A review of the HRM literature gives the impression that no consensus exists as to the best approach to the management of these skills. A variety of approaches exist which serve specific purposes. As a guide to training, the Engineering Board has identified skill components; building them up is presumed to facilitate the acquisition of skill. Similarly, the competency framework helps to identify



underlying job competencies which become training targets (Boyatzis, 1982). As part of the design of the work process, jobs may be fragmented, worker discretion minimized, and tasks reduced to simple repetitive movements and judgements. In this case skill becomes a residual requirement. Job design can also lead to synergistic integration of the technology and the worker; skill requirements become an integral part of the work system (Walton and Susman, 1987).

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In order to achieve equitable compensation, job evaluation follows the reverse process of starting with an existing job and analysing it in terms of widely accepted job factors such as know-how, problem-solving, accountability, and working conditions (Milkovich et al., 1988). Staffing may be based on experience as indicated by employment seniority, or on formal education and training demonstrated by the possession of professional qualifications. Skills are viewed as performance for a specific position. Can the candidate competently do the tasks that are required? Career management, on the other hand, tends to focus on both job performance and development of skills for future demanding jobs. Offering opportunities to acquire skills and developing existing skills in new situations are the priorities of this activity area. Thus within an organisation, there exists a variety of skill concepts each of which is applied to a specific HRM activity.

There does not exist a widely accepted concept of skills which has broad application and which could be used to discuss the coordination and coherence of HRM activities within the organisation. Originally, the competency framework was offered for this purpose with regards to the managerial group (Boyatzis, 1982). A job competency was defined as an underlying characteristic (motive, trait, skill, aspect of one's self-image or social role, body of knowledge in use) of a person which results in effective performance in a job through specific actions while being consistent with policies, procedures, and conditions of the organizational

environment. Boyatzis believed that rigorous application of the competency framework throughout the organization would lead to an integrated HRM system. In the subsequent decade, several large firms have introduced the framework, primarily for management development purposes (e.g., Jackson, 1989, Dulewitz, 1989; Cockerill, 1989). However, the competency model has led to a variety of meanings in organisations (Collin, 1989), and researchers have over-emphasised generalizability across work settings and organisations (Pye, 1988; Harrison and Stuart, 1993). The individual is treated as the basic unit, with less attention given to the changing job setting and organisational environment which are important for a strategic level of HRM analysis. The competency framework has not fulfilled its original strategic promise. This comes as no surprise when one considers that the model is anchored in job analysis, emphasises generic skills and tends to ignore specific skills, and requires relative stability in job demands and organizational environment to become cost effective. This researcher wishes to retain Boyatzis' (1982) broad view of skills which is compatible with organisational practices, but without the conceptual and methodological "baggage" associated with the competency framework.

Winter (1987) complained that little language exists to discuss the importance of skills in business strategy. In order to proceed in spite of this drawback, this dissertation puts more emphasis on how line managers view skills. They have the task of translating the business strategy into a working organisation and effective operations. In doing so, this research endeavour may make some contribution in creating the much needed skill language.

The difficulty of creating a strategic language on skills may stem from the tacit or embedded nature of skills. Because skills are people-embodied, and because people operate within complex social, economic and technological settings, skills cannot be



divorced easily from the context in which they are expressed. The following sections review what is known about tacit skills.

## **DEFINING TACIT SKILLS**

The term "tacit skill" was coined by Polanyi (1966) in his quest for understanding knowledge in general and scientific knowledge in particular. He argued that "knowing what" and "knowing how" are two aspects of the same event, and that intelligent action is anchored in the sentient body. The process of knowledge, of knowing more than we can tell, involves a relation of two components, one explicit and the other implicit. The meaning of the act (the distal component) is revealed through attending to the outside with the support of an implicit or tacit capability (the proximal component). Knowledge as problem-solving is an imaginative act by a committed and searching individual "indwelling" in tools as a bodily extension for the purpose of giving meaning to the environment.

Polanyi believed that objective knowledge does not exist independently of the individual, that knowledge belongs to a person with a commitment to a particular view of things, but interacting with the environment. Knowledge appears holistically, in the same manner that foreground and background are inseparable in perception. Subjectivity and objectivity are simultaneously present, with the viewer attending to the object made possible by the presence of a background. Both perception and knowledge are learned and change over time.

A precursor to Polanyi, Hayek (1945) recognised the importance of both systematic scientific and codified knowledge, and unorganised knowledge of particular circumstances of time and place. Embedded knowledge does not lend itself to systematization, yet it is involved in all jobs on the technical and social side. He

criticised the over-reliance on scientific knowledge in planning economic activity, and concluded that decision-making should be devolved to those persons closest to the field in order to tap this "tacit" knowledge.

Schon (1987, 1983) similarly criticised the bias towards technical scientific rationality in professional education while ignoring the more central role of artistry for skilful practice. Standard techniques could be applied to easily definable and familiar problems, but for situations of ambiguity, uncertainty and conflict, "reflection-in-action" was appropriate. Schon considered managers as professionals, argued that they test new interpretations by undertaking on-the-spot experiments, and do so by drawing on repertoires of cumulative organisational knowledge which they transform in the unique context before them, and thus contribute to the store of organisational knowledge. Schon believed that knowing-in-action or tacit skill is fundamental to skilful performance, and is the foundation upon which reflection-in-action takes place. Faced with the unexpected, our thinking serves to reshape what we are doing when we are doing it, questioning the implicit assumptions and way of framing the problem.

Both Polanyi and Schon focus on the challenge of problems and the discovery of solutions, and emphasise action within a specific context. While recognizing group interactions, they present the relationship of coach/teacher and apprentice/student as the main vehicle for learning to take place. Commitment and emotional involvement in this relationship and in the pursuit of knowledge are essential ingredients. Dialogue and demonstration take place, and attempts are made to make explicit the process of mastering a problem in a unique context. Schon proposed that the best learning situation was one where the person was free to learn by doing in a low risk setting with access to coaches to initiate and guide them.



Badaracco (1991) presented embedded or tacit knowledge as a phenomenon at the individual, group, organisational and inter-organisational levels. He defined it as skill based on intimate familiarity with certain tools and materials in a context of particular social arrangements including norms, attitudes, information flows, and ways of making decisions. The core capability of a firm becomes the knowledge embedded in a dense web of social, economic, contractual and administrative relationships. Teams constitute unique entities with the pooling of individual complementary knowledge, and the development of group norms and subtle forces of interaction linked to ambitions, pressures, and personal relationships. On a broader scale, organisational capability resides in "the interstices of their routines, practices, cultures, and working relationships."

Other authors have tackled tacit skills at the organisational level by expanding the concept to that of firm-specific assets (Williamson, 1985; Clark and Staunton, 1989) and routines (Nelson and Winter, 1982). The latter argued that both tacit skills and organisational routines require continuous application to be maintained. Degrees of skill tacitness exist, and articulation is often possible but at a price. Symbolic communication takes time, and the rate of information transfer may be slower than performance of the skill. Possession of the skill may be accompanied by limited causal understanding, and the skill has a coherence (ie., holistic characteristic) which tends to be lost in expressing the parts. Finally the obstacles to articulation may be overcome by incurring high costs difficult to justify. However difficult it remains to use language to describe a skill, it can be done easily by describing the larger units of purposive behaviour.

Nelson and Winter emphasised the tradeoff that exists between capability and deliberate choice, where the former operates best when choice is suppressed. Skilful



people perform quickly and effortlessly. Schon (1987,1983), on the other hand, argued that reflection-in-action was an essential part by which professionals dealt with novel problems. Knowing-in-action did suppress choice, but could be influenced by reflection. Nelson and Winters admitted that their theory applies mostly to stable firms, not R&D organisations where change is part of their economic activity.

Dosi (1988) reviewed the empirical literature on innovation, and made ample use of the concepts of tacit skills and specific assets. He concluded that researchers use personal knowledge bases composed of explicit/scientific and tacit knowledge that complement each other. There exists a variety of knowledge bases with varying degrees of tacitness depending on the procedures, competences and heuristics specific to each technology. Within each firm, the innovation process is cumulative with abilities and skills augmenting at the same time that public knowledge is accessed. However, the future options of the firm are constrained by its knowledge assets. Change in orientation can take place, for example, by hiring people and imitating other firms, but the process is long-term.

## **TACIT MANAGERIAL SKILLS**

According to Hosking (1988) and Kotter (1982), managers exercising leadership operate within, and help to define, the organisational context. Action-oriented skills are fundamental: networking, negotiating with and influencing others, and interpreting internal and external corporate events. Hosking and Fineman (1990) divided leadership skills into two types: a generic or transferable ability to recognise the kind of problem or issue confronted and the practical knowledge of how to deal with it; and an issue-specific knowledge which is built up and mobilized through networking. Though we take exception with the presumption that practical

knowledge is easily transferable, the social context of networking remains tacit. Mangham (1986) emphasized that skilful emotional expression with colleagues and adversaries is a crucial dimension: knowing what personal feelings to express, inflate or fake, and what injuries to inflict, in order to impress their definition of the situation. We conclude that managers exercise tacit skills within a thick social context.

Zuboff (1988) saw executive skills as embedded in individual action and characterised by sentient participation (feeling the situation and actors), contextuality, action-dependence, and personalism. While executive posts have retained their craft nature over the decades, middle managers were created to make best use of analytical and routine activities involving more explicit knowledge and intellectual skills. At the same time, they needed to exercise communication and persuasion skills in dealing with superiors and subordinates. In practice, executive skills are widely present in management ranks but in different degrees.

Both Pelikan (1989) and Eliasson (1990) have emphasized the tacit nature of relationships among managers as they pursue collectively economic competence. The latter argued that upgrading the tacit knowledge base at the top depends on having a career system to allocate competent people in a manner that educates them by varied job experiences. The firm-specific nature of management also suggests that shared ownership through shares was appropriate compensation.

## **TACIT SKILLS IN THE COMPUTERIZED ENVIRONMENT**

The introduction of computerized production has created a debate on the skills impact. Machines may replace many workers and those that remain do simple tasks on and around the equipment; de-skilling takes place to the benefit of



management control and increased productivity (Braverman, 1974; Edwards, 1979). On the other hand, a work organisation which creates synergy between the machine and the intelligent worker may achieve higher productivity and up-skilling while sharing control with the workers (Walton and Susman, 1987). Apparently a spectrum of possibilities exist. However, Manwaring and Wood (1985) concluded that no level of automation has succeeded in eliminating the tacit skills of people working with and around technology. This conclusion applies as well to expert systems which, contrary to expectation, need expert users (Collins, 1986; Scarbrough & Corbett, 1992).

Leonard-Barton (1990) reported that the skills context was a critical factor for successfully transferring a new technology within a multi-site firm. Corporate office could facilitate by making resources available for linking sites into a formal and informal information network to capture diffuse knowledge on organisational impact and operational "tricks". Local user-experts absorb and transmit the implementation knowledge in a manner appropriate to their context.

Manwaring and Wood (1985) reported that managers value social skills as much as technical skills in their production workers; cooperation, responsibility, stability and trustworthiness were important to the work situation and to "fitting in". These qualities have a high tacit component; feelings about self and others coupled with discretion are operative. Thus, in group settings, skills are expressed within a social fabric.

Zuboff (1988) contributed several useful insights on skills in the computerized work setting. Computers have increased the importance of intellectual skills; employees now interface with the computer screen and its symbolic content. At first glance, we see isolated individuals monitoring, enquiring, and inputting commands. But under



conditions of uncertainty, these individuals have dialogues with themselves and others, and congregate around the computer screen to solve the problem. The computer screen and room become the action context where the intellectual skills operate within a playful group interaction. In no time, a group culture evolves where permeable work roles create meaningful interpretations of the core processes captured by the electronic text.

Zuboff noted that intellectual skills, with the activities of reading and writing, are based on an explicit symbolic language code which can be taught. But once mastered, the individual displays a degree of tacit knowledge that becomes the basis for insight, innovation and improvement. Language can also be restricted rather than elaborated and operate within a shared context (Berstein, 1975). A person can point to the spatial relation of symbols on the screen and suggest to a viewer his intended meaning. We suggest that, even with articulate speakers, a conversation involves many pointers to items and aggregates of knowledge and experience.

It appears that intellectual skills can operate with more or less reliance on an action context but cannot divorce itself from it. Gardner (1983) has identified six relatively autonomous human intellectual competences which combine in a multiplicity of adaptive ways: linguistic, musical, logical-mathematical, spatial, bodily-kinesthetic, and personal. This patterning of intelligence in relation to the environment resembles a tacit faculty.

Zuboff (1988) concluded that knowledge, authority and technique are interdependent, and that a new strategy was required to obtain the full benefits of computerization. This means changes in career ladders, reward systems, access to information, and devolution of responsibility to operators, coupled with egalitarian

managers. The work contract would emphasise commitment to the enterprise instead of the job, and would be supported by new mechanisms for employee voice and influence. Operating as interdisciplinary teams, middle managers would have responsibility for intellectual skill development, technical development, strategy formulations, and social system development. Strategy would include assessing alternatives and focusing organisational intelligence in areas of strategic value by guiding and coordinating learning efforts. Presumably a line and staff function, such a strategy, if it exists, would resemble a SKISS.

Aoki (1986) dealt with similar themes in comparing large unionised Japanese and U.S. manufacturing firms. Japanese firms had horizontal rather than hierarchical information systems, and made good use of specific knowledge distributed across sub-units. Tapping and enriching tacit knowledge was supported by people policies of lifetime employment and stable relational contracts with a network of sub-contractors. Aoki found that U.S. firms had more specialised and standardised jobs, experienced more inter-firm mobility, and more use of the outside labour market. Managers spent more time integrating the various specialisations. Aoki believed that this applies as well to R&D. These results suggest that the firm's information and management systems are inter-dependent with the internal labour market and adapted to the external labour market.

## **TACIT SKILLS, STRUCTURE & NETWORKS**

Dosi (1988) suggested that in-house R&D is the dominant form for building knowledge bases because (1) it allows for tailoring the activities to the idiosyncratic and tacit aspects of the technology explored; (2) it facilitates information flow from R&D to production and marketing arms; and (3) it gives the organisation the capacity to evaluate and adopt external technology. Both Mowery (1980) and Pavitt



(1986) believed that large-scale corporate research is most effective in exploiting and internalizing the tacit and cumulative features of technological knowledge.

Williamson (1985) and Teece (1987) pointed out the danger that contracting out R&D can lead to dependence on an outside party for critical assets. The "know-how" or practice of technological innovation has a high tacit component that is neither easily imitated or transferred. Winters (1987) proposed six dimensions helpful for the management of these firm-specific skills and for securing control:

Tacit	-	Articulate
Not Teachable	-	Teachable
Not Articulated	-	Articulated (ie., Captured)
Not Observable in Use	-	Observable in Use
Complex	-	Simple (Quantity of Info.)
Element of a System	-	Independent

In order to exploit knowledge within the firm, management would encourage skills with characteristics to the left; to rapidly expand the use of knowledge and enter partnerships and the like, skill characteristics to the right are stimulated. Presumably, for the life cycle of a given innovation, an organisation would move from the left to the right. However, Winter did not explore the people policies which can influence knowledge assets, nor how skills are developed.

Badaracco (1991) was more interested in the global phenomenon of knowledge transfers and joint ventures of large sophisticated organisations. He contrasted embedded knowledge with migratory knowledge: packaged, articulated and mobile knowledge such as designs, machines, and to some extent individual minds. In order for a firm to exploit the migratory knowledge, it must already possess



complementary capabilities that form a receptive context. However, Badaracco did not explore the logical conclusion that all knowledge is an embedded phenomenon, and only contexts vary in terms of their receptiveness to the particular knowledge transferred.

For competitive reasons, Badarraco recommended the building of knowledge links with a wide variety of outside organisations (buyers and suppliers, university laboratories, firms, and labour unions) through relatively long-term alliances composing a network of trusting relationships. This network permits accessing the embedded knowledge of other organisations and of jointly developing new capability. Staff, equipment, ideas and cultural traits flow across organisational boundaries in a network of intimate social relationships. Badaracco concluded that the traditional organisational structure is displaced by network-based structure with more diffuse ownership. Managing within this new structure involves a more collaborative style, and the task of safeguarding and strengthening the firm's core skills.

Other authors have discussed the issues of dependence-independence in joint ventures and alliances, and the difficulties of achieving a successful relationship (Ohmae, 1989; Bleeke and Ernst, 1991). However, like Badarraco, they did not deal with the detail of how competitive skills are developed within and across organisations. In contrast, Grandstrand and Sjolander (1990) found that acquisition of small high-tech firms by larger firms within Sweden succeeded only if the managers and key personnel were retained, and if relatively independent venture units were established. Synergies were difficult to obtain from merging R&D functions which tended to compete. One could argue that the skill contexts under-pinning the innovation process explain these results.

Having reviewed the literature on tacit skills, what are the implications for research in skill supply strategy? Hendry (1993) has discussed the difficulty of treating skills as part of strategic management. The typical preoccupation of management with operational issues can point to either the strategic significance of the skillbase or the inability of managers to rise above the social and technical embeddedness of skills. It may be difficult to differentiate between these two conditions. The criteria for identifying a skills supply strategy become of critical importance.

## **BUSINESS STRATEGY & SKILLS**

Broadly speaking, business strategy can be defined in terms of content and context: an organisation's positioning in terms of products and services within a competitive market, and the structure it adopts to support this positioning (Miles and Snow, 1978; Porter, 1980). Business strategy can also be viewed from the perspective of process: a pattern in a stream of decisions where leadership plans and intentions can be compared with what the organisation actually did (Mintzberg, 1978; Mintzberg and Waters, 1985). Typically (but not exclusively) the purview of senior management, business strategy has an organisation-wide impact and represents a planned and significant investment of resources. However, viewed over time, the intended strategy may be transformed or even displaced by an emergent pattern which is less planned and more reactive.

Eisenhardt and Zbaracki (1992) summarized the empirical literature on strategic decision making and identified two dominant paradigms: rationality and bounded rationality (e.g., Cyert and March, 1963; Eisenhardt, 1989a), and politics and power (e.g., Pettigrew, 1973; Eisenhardt and Bourgeois, 1988). This researcher believes that both paradigms can accommodate intended and emergent processes, and that for

an empirical study, the appropriateness of one paradigm over the other will be indicated by the findings.

Pettigrew and Whipp (1991) have combined the two strategic approaches (content and context vs. content and process) by linking competitiveness and strategic change: senior management and other key participants make efforts to identify and understand the competitive forces at play and how they change over time, and attempt to mobilize and manage the resources necessary for the chosen competitive response over time. For the purposes of this dissertation, business strategy is assumed to have a content (particular products and services and adjustments to them), an inner context (resources, capabilities, structure, and culture), an outer context (markets, technology, and regulation), and a process (a pattern, with both intended and emergent properties, within a stream of decisions).

Recent empirical contributions in the strategic management literature have demonstrated how human resource management plays a key role in strategic change and competitive success (Pettigrew and Whipp, 1991; Beer et al., 1990). They showed how focused HRM activities created spirals of change and helped condition the remaining HRM context. Because their research questions were large in scope, these studies left unanswered the more specific question of how skills and their supply contribute to business strategy. Storey (1992) also reported on a major empirical study of 15 large unionized organisations and the changing employment relationship. While this work has revealed some fascinating trends in these "mainstream" companies (e.g., growing involvement of middle line management in HRM), it has little to say on the management of skills. A more focal "skills" study can be done similar to that of Pettigrew et al. (1988) which produced a contextual model of training and development.



The strategy literature has witnessed a small revival of interest in skills (Peters, 1984). Based on case studies of major U.S. and Japanese corporations, Prahalad and Hamel (1990) have argued that competitive advantage can be built on management's ability to consolidate corporatewide technologies and production skills into competencies that empower individual businesses to adapt quickly to changing opportunities. These core competencies are under-pinned by a variety of managerial, professional and technical skills. These authors have recognised the influence of the HRM context in fostering and mobilising these skills through communication patterns, career paths, management rewards, top management commitment, skill audits, and key skills as corporate rather than business unit resources. Implicit in their argument we find the internal labour market, but as a unitary concept and with no relation to external labour markets.

Klein et al. (1991) have criticised core competencies as a relatively static concept. They proposed the alternative of core skills as a systemic concept involving both human skill and a variety of organisational factors, for example, equipment and facilities, and organisational culture and design. They presented a simple model for acquiring and maintaining skills through innovation and learning, with the assumption that the skillbase is undergoing continuous change. They also introduced "skill categorising": the strategic process of combining and structuring dedicated skills into a forward looking set of core skills. This would involve an integrated approach to skillbase management cutting across HRM and capital budgeting, starting with skill audits. Whether organisations actually do so and how they came to a strategic approach to skills remains an unknown. In practice, these desirable skill synergies have been difficult to create (Sparrow, 1988).

Klein et al. (1991) argued that "embedding" of core skills could be promoted by an organisational culture encouraging employee retention, some stable structures to

protect them, and research projects to sustain them. With the absence of empirical evidence, how an organisation comes to foster and sustain core skills remains unanswered, and the dynamics between internal and external labour markets unexplored. Authors have yet to demonstrate the utility of the concept of core skills.

## **HRM VERSUS SKISS**

SKISS involves accessing and influencing the supply of skills in labour pools outside and inside the organisation with the intention of supporting the business strategy. Skills supply as a core organising concept was suggested by Hendry and Pettigrew (1990), but its rigorous definition and empirical investigation was left to future researchers. Before defining the concept in detail, locating it in the HRM literature may shed some light on its origins. Excluding the normative versions of HRM as best practice, the academic literature contains two alternative visions: human resources as means supporting ends, or as an end in itself. The former, labelled Strategic HRM, views people as an important asset which can contribute significantly to the business strategy (Wright and McMahan, 1992; Badaracco, 1991; Itami, 1987; Fombrun et al., 1984; Hendry and Pettigrew, 1986). The latter, called Consensual HRM, presents people as the cornerstone of the modern knowledge-intensive organisation; sound business strategy becomes synonymous with sound people management (Beer et al., 1984; Walton and Lawrence, 1985; Keep, 1991; Schuller, 1991). The distinction between means and ends tends to disappear. The high commitment organisational culture becomes the guiding vision of HRM. Storey (1992) described both of the above approaches as strong versions of HRM, that is, HRM integrated with the business strategy, with one being soft (Consensual HRM) and the other being hard (Strategic HRM). This researcher prefers the hard version: strategic HRM ought to have identifiable and specific

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linkage with the business strategy, and demonstrate the same focus, adaptability, and market orientation. Organisational culture, then, is treated as part of the inner context which influences strategic HRM.

Both alternatives replace the more traditional view of people as costs (Goold and Campbell, 1986; Purcell, 1991). This traditional view was inspired by a confrontational labour relations climate and by the dominance of the financial function within organisations. It nevertheless has a strategic aspect in that careful plans are made to manage the workforce budget and operationalisation takes place through the financial control system. However, because this approach lacks a sophisticated appreciation of the potential contribution of people, it has little to say about skills.

The new competing visions overlap and are differentiated on the basis of degree on most matters. They differ sharply in how they relate to the larger concept of HRM. Strategic HRM permits selective attention to those components which address a critical business requirement such as addressing a skills gap (Hendry et al., 1988) or fostering entrepreneurship within the firm (Burgelman, 1983; Kanter, 1985). The remaining components of HRM can be viewed as the immediate context for the focused activity. In contrast, consensual HRM remains engaged with the entire spectrum of HRM policies and practices, and drifts towards the framework of organisational culture and a humanist HR philosophy.

The concept of SKISS distinguishes between an intentional pattern of HRM components (policies and practices) that together aim to influence skills supply, and other HRM components which serve other purposes. Human resource management is the larger concept, and includes policies, practices, and formal and informal systems which can be called upon to influence the workforce. It also includes



elements which, to some extent, are imposed on management such as legally mandated obligations, collective agreements, and the organisational culture or tradition. In other words, HRM acts as a context for the more focused skills supply strategy. As context HRM can both facilitate and inhibit changes in SKISS. Sometimes changes in HRM features may be required before a skills supply strategy can emerge and succeed.

Within the panoply of HRM, the concept of workforce planning resembles that of SKISS. Workforce planning studies and forecasts the supply of labour (labour markets and internal workforce) and its demand based on organisational and business assessments. The dynamic nature of skills supply is captured by the notion of human resource (HR) flows: people moving into and out of the organisation and within it as well. Timperley and Sisson (1989) have reviewed the history of manpower planning in Britain. Typically the purview of personnel managers, manpower planning tended to be reactive and isolated from the strategy process. Jobs and not skills were the unit of analysis, though the latter was given some consideration. The literature has been technique oriented with little attention given to the implementation of these plans. Within the current business environment of intensified competition and skill shortages, these authors suggested that manpower planning might be transformed by the needs of organizations and their top executives, and the search for the 'right' people performing the 'appropriate' tasks.

Within the U.S., Beer et al. (1984) saw HR flows as an important policy area to ensure employee performance now and in the future. Moving people in, around and out of the organisation ought to make sense in terms of desired employee performance; the pace or velocity of movement becomes an issue. Career paths need to build the right mix of skills in terms of depth and breadth. Though neither side

of the Atlantic has adopted the language of skills supply strategy, discussion focuses on the management of the internal workforce. Timperley and Sisson (1989) noted that operational studies of manpower planning have received little attention in the literature. Hence, a change study of HR flows would help to fill this gap, and adopting a SKISS approach would anchor the study in business strategy concerns.

Wright and McMahan (1992) defined strategic HRM as "the pattern of planned human resource deployments and activities intended to enable an organization to achieve its goals". They reviewed four theoretical models of strategic HRM: resource-based view of the organisation (Wernerfelt, 1984; Schuler and MacMillan, 1984; Ulrich, 1991), behavioral perspective (Miles and Snow, 1984; Schuler, 1991; Schuler and Jackson, 1987), cybernetic models (Mowday, 1985; Wright and Snell, 1991), agency/transaction cost theory (Jones and Hill, 1984; Eisenhardt, 1988).

Butler (1988) proposed that HRM policy is a product of an intentional strategy, but could lead to both intended and unintended actions which would influence the emergent business strategy. Similarly, Wright and McMahan (1992) supplemented their initial review of HRM theories, which assume rational and intentional decision-making, with two nonrational theories: power/resource dependence models (Pfeffer and Cohen, 1984), and institutional theory (Meyer and Rowan, 1977; Scott, 1987).

This dissertation sits squarely within the resource-based or internal capability theory where human resources (along with other resources) are intentionally managed in order that the organisation develop a unique ability to deliver products and services. This basis of competitive advantage requires constant nurturing and adjustment of the skillbase. The adoption of contextualism (see Chapter 3) as a framework for the study of SKISS overcomes the limitations of the above theories

(including resource-based theory) which emphasise one or the other of the content, context and process of strategic HRM. However, aspects of these theories may help to inform the findings of our case studies. Strategic HRM as an intentional process is a starting assumption that will focus our attention on the linkage with business strategy. Thereafter, the case analysis can point out the emergent aspects as part of the contrast between intentions and realizations (Mintzberg and Waters, 1985).

We conclude that SKISS shows promise as an analytical tool for the investigation of the contribution of human resources to a business strategy seeking competitive advantage. The focal nature of SKISS means that human resource management can be viewed as part of the organisational context which influences the relationship between SKISS and this business strategy. Based on the above literature, a recognizable pattern of changes in HRM policies, programmes and practices would qualify as a SKISS if four criteria were satisfied:

- (1) an identifiable link with the changing business strategy;
- (2) managerial intentions to create and maintain HRM support for the business strategy;
- (3) a coherence among the HRM elements which are mutually reinforcing in terms of supporting the business strategy;
- (4) a consistent managerial effort to achieve and exploit the desired linkage to business strategy.

The evidence for linkage between the skill supply patterns and the business strategy should be unambiguous and persuasive in the same manner that, for example, developing new products would be linked to serving a new market (Criterion 1). Furthermore, the managerial group should demonstrate that the linkage is not a chance occurrence but a product of deliberations and intentions focused on the business strategy (Criterion 2).



Given that skill supply patterns are determined by specific HRM components, the coherence of the latter, how each component reinforces the other components, would ensure the desired strategic effect (Criterion 3). Lack of HRM coherence likely would create weak or conflicting patterns.

Viewed over a time period, these three requirements (strategic linkage, managerial intentions, and the HRM coherence) should be reflected in consistent managerial efforts to achieve the benefits of the desired skill supply patterns (Criterion 4). By efforts, we mean numerous actions and decisions which bring to bear resources (time, people, and budgets) to resolve skill issues and create or sustain the desired skill supply patterns.

We note that Criterion 1 (strategic linkage) and 3 (HRM coherence) refer to the content of SKISS, whereas Criterion 2 (managerial intentions) and 4 (managerial effort) refer to the process of SKISS. All of these criteria have as their backdrop the organisational inner and outer contexts which influence what people do and how they do it.

## **DEFINING SKILLS SUPPLY STRATEGY**

A firm's skillbase may be defined as the combined technical, interpersonal and managerial skills of all of its employees which are exercised for the attainment of organisational goals. Skills are people-embodied, but become organisational capability when expressed within a work organisation composed typically of inter-dependent tasks which call for these skills and which are supported by technology and management systems. Defining these skills and tasks, creating/maintaining a supportive context, and adjusting the work organisation to new business

requirements, can be considered as an integral part of the business strategy or its operational phase.

SKISS manages the skillbase through the coordinated use of the following levers: sources of initial recruitment into an organisation, additional training and development once recruited, and various policies for managing, retaining, promoting, and discarding people (Hendry et al., 1991). An important distinction is that of external labour markets (ELMs) accessed by the firm and the internal labour markets (ILMs) composed of some or all of the firm's employees. Though the first concept is straightforward, an ILM has come to signify patterns of movement, vertically and laterally, within and across organisational boundaries, to meet promotion needs and skill requirements, with restrictions on entry and leaving, and inducements to remain within the organisation (Osterman, 1984; Doeringer and Piore, 1971). Thus SKISS involves accessing and influencing the supply of skills in ELMs and ILMs, particularly skills critical for the corporate and business strategies.

SKISS involves the shaping (mix of skills) and sizing (number of employees with key skills) of the skillbase in order to support the changing business and corporate strategies. It also underlines the competitive advantage that can flow from skills. On-going effort is required to understand the changing skillbase and to integrate this understanding into the strategy process. Where technology and products are changing rapidly, as in high tech firms, managing the under-pinning skillbase takes on strategic importance (Klein et al., 1991; Prahalad and Hamel, 1990).

All business strategies, whether explicitly or implicitly, assume the availability of managerial, professional and technical skills to perform a set of business activities which operationalise the business strategy. In simplistic terms, this means



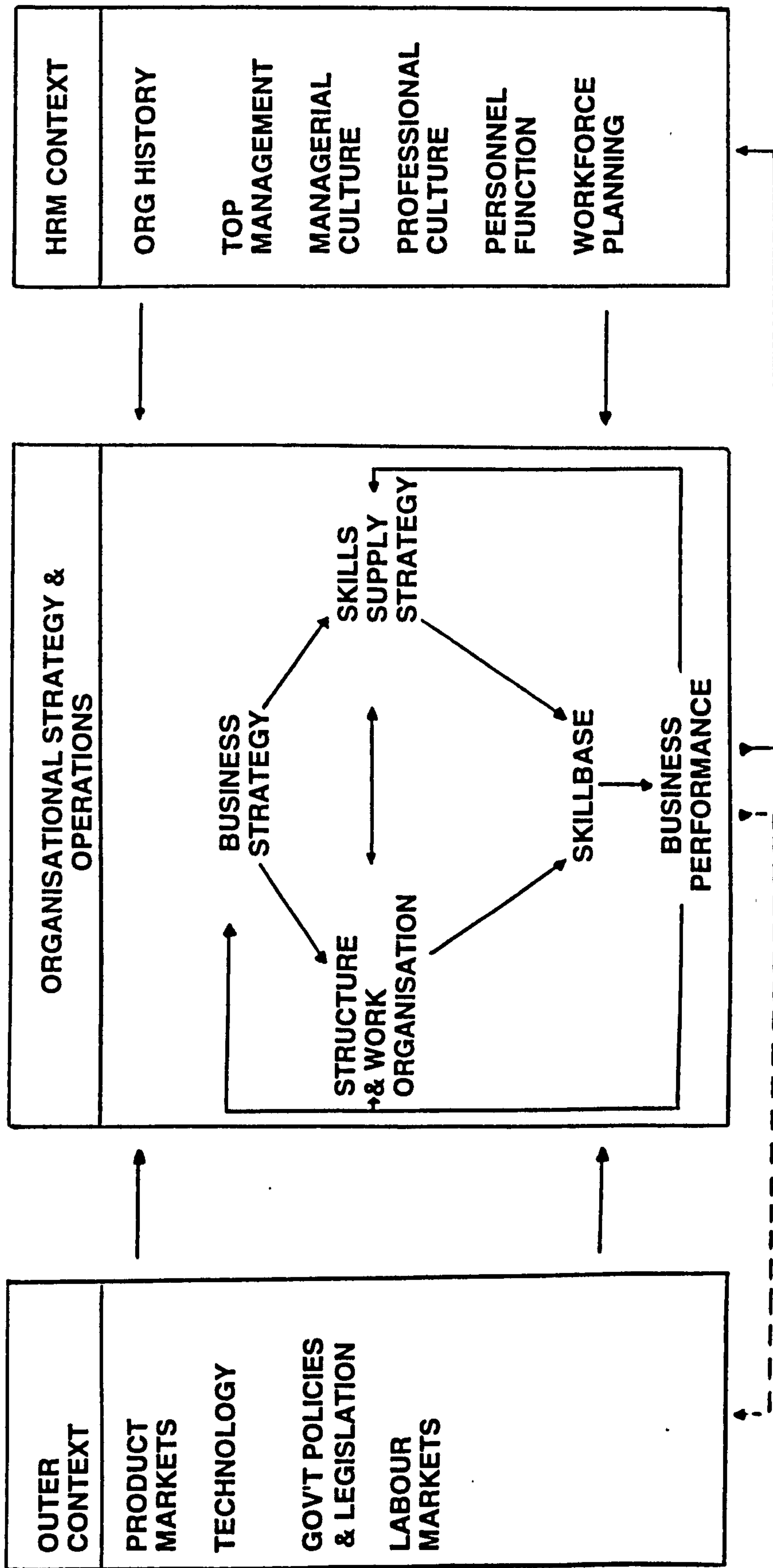
recruiting people with new skills and retaining them for the duration of their use, and retaining the best of existing employees who have some of the desired skills. The departure of the remaining employees may be stimulated. Also, to the extent that some of the skills are firm-specific and need building-up through training and development, the retention of existing employees would be favoured. Whether firms set retention goals and what levers organisations pull to influence retention at the inflow, assignment flow and outflow of human resources (Beer et al., 1984) has received little attention in the literature. In the 1970s, Flamholz (1974, 1973, 1972, 1971) studied the economic value of the employee to the firm (expected stream of revenue over the career of the individual). Replacement cost was viewed as a decision framework for attempts to retain the employee. While making an important contribution to the valuation of human capital, Flamholz's work makes unrealistic assumptions (stability and predictability) for the current economic environment and the operations of the organisation. However, the notion of targeting employees difficult or costly to replace through improved compensation continues to be relevant.

In addition to the mix of skills, the size of the workforce would reflect expected levels of business activity; high recruitment and retention would apply under growth circumstances, and low recruitment and retention during a downturn. Thus retention mechanisms help to shape and size the workforce, and may target key groups of employees. As part of SKISS, retention policies and practices would be influenced by the HRM context.

Organisational Model of SKISS. A conceptual model of SKISS is presented in Figure 2.1. The skills supply strategy can flow from the business strategy as an integral part of it when HRM planning contributes to strategy formulation. Such an integrated strategy process would address not only "size" issues (total number of



**FIGURE 2.1: ORGANISATIONAL MODEL OF SKILLS SUPPLY STRATEGY**



employees in job groupings), but also "shape" issues (skill requirements). SKISS can also appear as the emergent operationalisation of a business strategy which has failed to go beyond the "size" issues at the formulation stage. These two processes (planned versus emergent) also impact on structure and work organisation which have a close relationship with skills supply at the operational level. The existing work system represents cumulative efforts to perform certain coordinated tasks through people who have become skilled in using certain resources (e.g., equipment and material). The work system influences current and future skill requirements, and the availability of skills within and outside the organisation makes certain work systems more possible and productive. The skillbase or skill configuration is shaped by the above process, impacts on the collective performance of the employees and thus on business performance. Through feedback loops, adjustments are made.

The entire organisation is surrounded by an outer context of which the principal features are product-markets, technology, government policies and legislation, and national and local labour markets. In the long run, the outer context strongly influences the business strategy cycle and the contribution of skills to business success. To some extent the large firm can exert some influence on its environment.

The organisational strategy and operations are also constantly influenced by the HRM inner context composed of the organisational history, top management, managerial and professional cultures, the personnel function and operations, and workforce planning. Modification of the HRM context can take place, but the historical and cultural features likely would impose a slow pace of change (Storey, 1992; Pettigrew, 1986). The model situates SKISS within the organisation, and suggests possible pathways for change. But like any map, the model appears static and only gives the main roadside features. The top-down appearance of the model

reflects the starting assumption that business strategy is a planned activity. For the purpose of guiding this research endeavour, a more rigorous framework of organisational change is presented in Chapter 3.

## **INTERNAL LABOUR MARKETS**

SKISS involves accessing and influencing the supply of skills in the external labour market (ELM) and the market internal to the organisation (ILM). These activities become strategic when they support the business strategy, or when their consideration is integrated into corporate decisions. The concept of ILM has a strong economic flavour due to its origins (Doeringer and Piore, 1971). Economists assumed that the supply and demand of labour on the open markets is determined by the price and allocation of labour. They were interested in ILMs because they seemed to be an exception to the law of supply and demand. Within-firm rules were substituted to some degree, and were associated with long tenure, promotion from within, training and development, pay by seniority, pensions, and due process (Osterman, 1984; Siebert and Addison, 1991). Despite the interest in ILMs, little empirical work has been done at the organisational level.

In order that a within-firm market develop, Siebert and Addison (1991) argued for a minimum of 500 employees. With this size criterion, they estimated that, in 1986, 46% of all full-time U.K. employees in the private and public sectors were in ILMs. Oi (1983) proposed an overall average of 40% for the U.S.. In a more general sense, whenever an employer has training and development of existing employees beyond the orientation phase, or practices a measure of promotion from within, some form of ILM is operating. Thus, a size criterion seems unnecessary, and the form and extent of ILMs operating become an empirical question. Indeed, Hendry et al.



(1991) have demonstrated the relevance of ILMs (as part of a skills supply strategy) to small and medium firms.

Osterman (1984) reviewed two competing rationales for ILMs. First, high transaction costs lead to the creation of an ILM. This refers to the situation where the firm has specific and evolving tasks, and the feasibility of fully describing and enforcing the related jobs is low and the cost would be high. In order to obtain co-operative behaviour, rules and procedures (eg., promotion from within and grievance procedures) are set up to support group interests and discourage opportunistic behaviours (Williamson et al., 1975). Second, management seeks to control workers through new technology and deskilling, and creates an acquiescent internal workforce through payoffs (Braverman, 1974). Osterman concluded as follows:

"Without doubt internal labour markets perform the efficiency functions of conserving on supervision, assisting in the training process, and helping to keep skilled employees attached to the firm. However, unionization drives, intraunion politics, government intervention, national and community cultures, and work group norms also play important roles in explaining the emergence of these job systems. As yet no well-developed paradigm is available to knit these factors together."

Siebert and Addison (1991) also reviewed the theoretical literature on ILMs and noted the focus on wages and transaction costs. They also identified the human capital approach which deals with investments that the firm and employee make in the hiring and training process where mutually beneficial incentives are at play. Long term employment contracts and self-selection of stable employees maintain a stable ILM.

Flexible Firm. The investigation of innovative work organisation by the Institute of Manpower Studies has led to a model of the flexible firm in which the ILM has a

core and peripheral workforce (Atkinson and Meager, 1986). Based on case studies, the model proposes a core organisational workforce buffered by a peripheral workforce (part-time, temporary and contract). The core contains the critical skills and the workforce has high employment security. The periphery complements these firm-specific skills with additional capacity, less critical skills such as catering, and scarce specialist skills. The peripheral workforce has low employment security. In their continuous drive for productivity improvements, and due to growing uncertainty in product-market growth, organisations seek functional and numerical flexibility. The former is achieved through adaptable job demarcations and multi-skilling. The latter is obtained through careful management of the size of the core and the expansion/contraction of the periphery. The creation of the core/periphery workforce is facilitated by high local unemployment and by the fear of employment loss within the firm. Atkinson and Meager reported on wide changes in personnel policies and practices to support this skills supply pattern, namely, employment contract types, pay, benefits, recruitment, selection, and training. Yet for most firms, these changes were ad hoc and opportunistic instead of part of a strategic plan.

Pollert (1988) and Elger (1987) have criticised the above model as simplistic and poorly supported by the case material. The Department of Employment has responded by careful analysis of a national survey and case material. McGregor and Sproull (1991) reported that the mid 1980s witnessed a modest growth in the proportion of the workforce in peripheral employment but no broad shift in the employer reasons for doing so. Offering part-time employment was viewed as a way of retaining valued staff who could no longer work full time. Many part-timers and self-employed persons were reported to prefer such contracts, presumably to suit their preferred lifestyle and obligations, and their desire for autonomy. However, a minority of firms were citing new reasons such as cost savings and manning

flexibility. Hunter and MacInnes (1991) found that some employers were increasing their use of non-standard contracts, but they did so in response to short-term competitive and budget requirements and not as part of a coherent strategy. Unfortunately, it is difficult to identify the high technology organisation within the above studies.

From the perspective of skills supply strategy, there is no apparent need to adhere to one theory of ILMs rather than another given that little empirical work has been done. For our purposes, the concept of ILM refers to a relatively stable internal workforce that is renewed, developed and modified over time as part of the adaptation to changing skill requirements. To what extent it operates successfully in large high technology organisations, and to what purpose, are best revealed by field work.

## **RETENTION MECHANISMS**

Presently, there exist few macro-organisational studies on retention, one of the key mechanisms operating in ILMs. Most of the current literature utilises person-centred models using concepts such as job satisfaction, job involvement, and organisational commitment, with commitment and turnover used as dependent variables (Blau and Boal, 1987; Morrow, 1983; Mowday et al., 1982). These concepts have been criticized as somewhat redundant because of similarity in the content of their operationalization giving rise to spurious correlations. Others have related human resources management practices directly to commitment levels (Ogilvie, 1986; Pinks, 1992), and structure and climate to commitment levels and turnover (DeCotiis and Summers, 1987; Eisenberger et al., 1990). Reichers (1985) and Coopey and Hartley (1991) have criticised the commitment literature for failing to recognise that an individual's commitment is tied to a variety of constituents in



the organisation. In other words, the concept of organisational commitment as unitary and indivisible misrepresents the social dynamics at work. While recognising the contributions made to date to our understanding of individual (micro) behaviour, the task of explaining organisation-wide (macro) dynamics remains undone. Clearly, new concepts are needed to facilitate analysis.

In this dissertation, retention mechanisms are conceptualised as packages of hard and soft benefits which are offered, explicitly or implicitly, to employees in order to influence their continued presence in the organisation. Hard benefits refer to compensation and related policies. The categorisation proposed by Blakin and Gomez-Mejia (1990) has been adopted with minor modifications for our study: base salary (market position), benefits, incentives such as bonuses and profit sharing, and the importance of each of these three components within the total compensation package. These three components are influenced by a variety of pay policies: type of employment contract, risk sharing between employer and employee, internal consistency, pay secrecy, pay for performance, pay decentralisation, egalitarian pay (perks), participation in pay decisions, job-based vs skilled-based pay, and long-term vs short-term pay orientation. Milkovich (1987), Bamberger et al. (1989) and Blakin and Gomez-Mejia (1990) have emphasised the centrality of compensation in the recruitment and retention of high technology employees. Gomez-Mejia and Balkin (1989) found that packages emphasising aggregate incentives were viewed by knowledge workers as more effective than those emphasising individual-based rewards (merit pay or individual bonuses). Profit-sharing and stock-based plans were thought to increase employee retention, but team-based bonuses gave the additional advantages of impacting on performance and pay satisfaction.

Soft benefits cover a wide variety of characteristics of the job, the immediate job environment, and the organisational environment. Miller (1986) has provided insights and guidelines for the management and retention of R&D professionals in terms of discretion and control of the means and ends of their work. Miljius and Smith (1987) reported on three HRM activities important to attracting and retaining talent in U.S. high technology organisations: offering job challenge and recognition for their contribution to organisational success; innovative compensation and inducements; and individualised career development opportunities typically integrated with performance appraisals. Other authors have echoed the importance of these activities and added other soft benefits: exciting work related to cutting edge technology, company reputation for innovation and growth, presence of major research universities, career opportunities for the spouse, difficulty of switching school for children, desirable geography and weather, and cultural and recreational diversity.

Sparrow (1988), Yeats (1987) and Connor et al. (1989) reported on British surveys of the recruitment and retention of professionals and specialists. Improvement of remuneration levels were the primary response to scarce skills. Market and skill pay supplements, and recruitment bonuses were offered with term contracts as the most flexible solution to recruitment and retention problems within the framework of the organisation's existing pay policies and structures. Reliance on freelance, contract or temporary labour increased the supply of scarce skills while helping to protect the core workforce from redundancies. Recruitment was also facilitated by the positive image of the organisation: technological leadership, investment in R&D, business success, and a fair employer offering good terms of pay and conditions. Retention of the best employees was sought through pay flexibility with high pay for high performance, salary adjustments 2 or 3 times a year for critical staff, and retention bonuses. A widening range of benefits was offered including a

car. Other practices included improved work content with new and exciting work, innovative employment practices such as homeworking, and improved career management and progression.

The above findings suggest that recruitment and retention often are served by the same benefits. Other benefits are tailored for either recruitment or retention. Turbin and Ross (1990) deplored the lack of research into the effectiveness of alternative recruitment and retention strategies in high technology organisations, and the absence of contextual studies of organisations with their own internal dynamics and surrounded by specific labour market conditions. Von Glinow (1985) explored the inter-dependence between the reward system and the organisational culture, but provided no empirical evidence to support her typology. Balkin and Gomez-Meija (1990) matched compensation patterns (organic versus mechanistic) to organisational strategies (diversification and life cycle of business unit) based on a U.S. manufacturing survey of HRM executives. Both of these studies recognised the need for change-oriented research. At this point, little field work exists documenting the "what, why and how" of changes in packages of hard and soft benefits that take place in organisations responding to changing business and skill requirements.

## **SKISS IN LARGE HIGH TECHNOLOGY ORGANISATIONS**

Within the information technology (IT) sector, two SKISS related topics have dominated the 1980s: skill shortages and changing skill needs. Skill shortages have captured management attention because of the widely shared opinion that business growth was constrained by the low supply of specialised skills and mixes of skills in ELMs. In the U.K., efforts were made to attract and retain these people (Sparrow, 1988 ; Connor et al., 1989; Locksley et al., 1990). Presumably, firms that



successfully recruited and retained key skills obtained a competitive advantage. Faced with continuing recruitment problems and the effects of the demographic changes in the future supply of young entrants, some employers were starting to give more consideration to widening the range of sources of potential recruits, both internally (eg., retraining and deployment of staff, reorganising and redesigning IT work) and externally (eg., alternative degrees and accessing easier provincial labour markets by relocating their IT work).

Within high technology firms, skill needs evolve rapidly because of the rapid changes in technologies which are applied to organisational processes and products. As technologies change, existing skills are recombined and new ones may be recruited or developed. Considerable uncertainty surrounds the need for professional skills because of uncertainties in product markets and technology which are rapidly changing (Kosnik, 1990). A flexible and evolving skillbase becomes mandatory in these circumstances.

During the 1980s, the role of management has undergone significant change through restructuring and the increasing use of information technology (Applegate et al., 1988; Kanter, 1989). Mobility among management has also increased (Nicholson and West, 1988) with downsizing among established firms and the creation of new firms. A growing number of managers may be adopting the new inter-firm career patterns described by Kanter (1989). In high technology firms, experienced project managers are highly sought because of their low supply (Connor et al., 1989). Within this context, the drive to increase the quality of management in the U.K. has led to an interest in defining managerial skills (Hirsh, 1989).

Beer et al. (1984) described the skills supply pattern of lifelong employment typical in large U.S. firms. People enter at low entry-level positions and stay in the organisation for their entire career. Relatively low turnover exists. Compulsory redundancies do not take place, but poor performers may be asked to leave. In the early 1990s, this researcher confirmed first-hand that within the British IT sector, all of the major players (IBM, Digital, ICL, Hewlett-Packard, and BT) continued to have lifetime employment policies, not to mention the public sector offering civil service tenure. At the same time, it was evident that changes were taking place, and that lifetime employment as an employment system was under attack.

Beer et al. (1984) claimed that in most cases "the choice of patterns selected by an organization is less reflective of a coherent set of management attitudes and values than it is of the economic environment in which that organization operates"(p101). On the other hand, they recognised the impact of societal values and legislation, and founders.

Osterman (1987) describe the 'salaried' pattern of skills supply. Job descriptions are standard, but management can make revisions and the employee accepts doing new tasks. Job ladders and promotions are present but less evident than in industrial settings, and salaries are more merit-based. Greater commitment to employment security exists. Osterman believed that the salaried pattern fit the situation of most managers and professionals working in bureaucracies, and employees of innovative firms. Though Osterman recognised the likelihood of multiple ILMs within the same firm, his discussion ignores this possibility.

Sonnenfeld (1991) described large firms as either "academies" (stable institution with an objective of developing the knowledge of its highly committed members) or "clubs" (fraternal order oriented towards rules of fair treatment of its members



with loyalty shown through seniority). Academies recruit exclusively at the career entry stage, emphasise development in their career system, and offer ample training throughout a person's career and in conjunction with new jobs. They control the assignment flow through sponsored tournaments, and exit people by retirement. In contrast, clubs also recruit at the early career stage though with more flexibility. The career system aims for the retention of employees, and assignments are given on the basis of seniority. Training is given mostly at the early career stage, and sporadically thereafter for general use. Again, employees are exited through retirement.

Recognising the need for empirical work on the strategic management of HR flows, Sonnenfeld suggested that, based on Kanter's (1984) description of large high-technology firms, these organisations would be classified as "academies" intent on developing and retaining their own talent.

In the U.S., Kanter (1989) has argued that the salaried or "academy" ILM is undergoing change in the direction of the core-periphery workforce. Smaller numbers of managers make their career in one organisation and larger numbers market their skills and innovativeness to a number of firms during the span of their career. The idea of employment security is being replaced by "employability" security. Even those managers benefiting from the traditional form of employment security find their jobs radically altered in the flatter organisations where different skills (e.g., persuasion and influence) are required. Presumably, new types of employment contracts are used to achieve this "flexible" use of managers. Also, the extent to which these same changes apply to the professional workforce remains unexplored. Streeke (1987) has suggested that organisational flexibility can be created by either more emphasis on contracts and ELMs or by more permanency status and an enlargement of the ILM. The task remains of documenting if, why



and how large organisations within the British IT sector are modifying their policy of lifetime employment and adopting a perceptible skills supply strategy.

## **SUMMARY**

A skills supply strategy is defined as the intentional shaping and sizing of the organisation's skillbase (composed of technical, interpersonal, and managerial skills) for the purpose of supporting the business strategy. Influencing the skillbase takes place through the coordinated use of multiple levers such as recruitment, development and retention. Packages of hard and soft benefits compose the retention mechanisms which are adjusted, along with other levers, as skill requirements change. SKISS shows promise as an analytical tool for a focused investigation of the business contribution of human resources, with HRM treated as part of the organisational context. Within large high technology organisations, SKISS was built upon a policy of lifetime employment; these "academies" emphasised the sustained development of their committed employees. This dissertation can make a significant contribution by demonstrating that the concept of SKISS facilitates the discussion of skills in relation to the business strategy of these technological organisations. Though difficulties are anticipated in identifying SKISS in the field because of the tacit or embedded nature of skills, this researcher has set four criteria to be satisfied, namely, linkage with the business strategy, managerial intent, coherence of HRM elements, and consistent managerial efforts.

## **CHAPTER 3: RESEARCH PROCESS**

### **INTRODUCTION**

In this chapter, the research framework and procedures are outlined, as well as the personal learning which the researcher experienced. Key concepts include receptive context, survey of academics, research objectives, significant academic contribution, craft of research, basic assumptions, contextualism as a research framework and method, theoretical sample, triangulation, corroboration of results, data reduction and summarization, and pattern recognition. The chapter begins with the history of the dissertation: what prompted the researcher to seek the Ph.D. at Warwick University, and how the research topic and objectives were sharpened. Craft aspects of research are introduced: the relationship between the Ph.D. student and supervisors, ethics and confidentiality. After presenting the researcher's basic assumptions, the chapter presents the framework of contextualism (the what, why and how of change) and its application in the field: choice of organisations, data gathering, and the iterative process of data analysis within and between cases. The chapter ends with a defence of the lone scholar, and a summary of the main points. The strengths and weaknesses of contextualism are discussed along with the personal learning which took place.

## SEEKING THE PH.D.

In 1983 I joined the teaching and research staff of the School of Commerce & Administration at Laurentian University in Sudbury (Canada). Early on, it was pointed out to me that an academic career was built on expertise and the advanced degree of Ph.D.. As I began to publish in refereed journals, my confidence increased at the same time as my dissatisfaction grew. The quantitative survey techniques which I applied in the fields of housing and retirement gave interesting and generalisable results, but left me the task of describing and guessing what was taking place within the organisation. The researcher ended up supplying the background information to situate the findings and breath life into them. The limitations of the survey technique in terms of validity was doubly evident because of my daily exposure to the case method at the School of Commerce. Rich qualitative data with some supporting quantitative data succeeded in portraying organisational life with realism. Could this approach satisfy the rigorous methodological requirements of a Ph.D.?

In the summer of 1988, I came to "this blessed isle" and visited Warwick University and the Centre for Corporate Strategy and Change (CCSC). Three features influenced my decision to pursue the Ph.D. at this place. First, CCSC was impressively productive as measured by the number of publications, well organised and well funded. It assembled mature researchers in a cordial environment and gave them active support. Second, my discussions with Professor Andrew Pettigrew and Dr. Chris Hendry confirmed that they favoured in-depth case studies and were prepared to guide me in applying the methodology of contextualism broadly applied at CCSC. I became convinced that expectations would be high and that pressure would be applied as required. Such conditions would help me avoid the sad fate of



too many Ph.D. candidates, the timeless search that ends in despondency and abandonment. Third, Warwick University was thriving. The setting was attractive and the social and academic interaction was exciting. Leisure activities for body and soul would be within easy reach. All work and no play would have been unsuitable for my French-Canadian constitution.

In January 1989, I was formally enrolled. Meanwhile, I undertook a survey of training activities in Ontario, Canada. This initiative was prompted by my interest in demonstrating that the case method constituted a firm base from which to apply the survey method (see Brewer and Hunter, 1989 for the benefits of using multimethods). If the two methods were complementary, both high validity and high generalisability would be achievable within a medium term research agenda. Thus a case-oriented Ph.D. would be amenable to such a follow-up. The Centre had just completed a series of case studies on training in the organisation and had proposed a change-oriented model to represent the findings (Pettigrew et al., 1988a; Pettigrew et al., 1988b). I resolved to translate the model into a questionnaire and test its generalisability to a Canadian sample of firms. The results (LeBrasseur and Lambert, 1991) were supportive.

### **SHARPENING THE RESEARCH TOPIC**

Initially I prepared a research proposal titled "Strategic Human Resource Management of Older Workers". Based on my experience in Canada, the general ageing of the industrialised countries, the trend towards early retirement, and the presence of skill shortages in high technology settings, I thought that such a study would be timely. Firms should be making efforts to retain their high skilled older

employees. In the summer of 1989, I visited CCSC for the second time, and was advised that a quick telephone "survey" of personnel managers and research centres was in order. Was the proposed topic an area of interest in the private sector in England? What kind of research was taking place related to this topic? In other words, was the topic considered of sufficient importance by firms that they would be willing to participate in such a study and grant site access, and was the research proposal covering new ground?

The results of the dozen calls proved to be revealing. The situation was different than in Canada. "Yes", the population was aging, and "Yes" skill shortages existed, but "No", firms were making no particular efforts in retaining older employees. In contrast to Canada, no cultural and legal imperative existed which pushed firms to approach the aging workforce in a positive light. Age discrimination in England was widespread and generally unquestioned. Consequently, the level of interest and research on the proposed topic was low.

The telephone "survey" did uncover a more focused interest in the retention of critical skills. At that time the economy was expanding, and firms were experiencing difficulties in obtaining an adequate supply of expert managers and professionals. Little research had been done in this area, and academics felt that it was much needed. That autumn and winter, the proposal became "Retention Strategies in High Tech Companies". In the summer of 1990, I undertook a pilot project involving two large Canadian firms, with the purpose of identifying retention mechanisms and of getting some field experience. This experience confirmed that the retention mechanism, refined into hard and soft benefits, was an analytically useful concept.



The full-time period of study lasted two years (September 1990 to July 1992), composed of a sabbatical year and a study leave. The arrival of the recession brought to light the limitations of a narrow attention to retention mechanisms. Within the new economic environment, managers complained that their large organisation was too successful in retaining people, and that the real challenge was finding ways of exiting them in larger numbers despite the existence of a policy of lifetime employment. Thus, with changes in the economic environment, retention objectives were modified to deal with the new business requirement of cutting costs. The more inclusive concept proved to be that of skills supply strategy with retention mechanisms operating along with recruitment and development activities.

### **SHAPING THE PROFESSIONAL**

The Ph.D. programme has a dual purpose: (1) producing significant contributions to the academic knowledge base, and (2) training and developing academics (Phillips and Pugh, 1987). The first point was discussed in the previous section. The second covers the practice of research in the field and at the writing desk. These craft aspects of research constitute part of the framework for making a knowledge contribution in that the research method chosen and how it is applied determine the kind of knowledge produced. The vantage point or perspective adopted and the path subsequently travelled determine what the traveller will experience and whether he or she comes out enriched. Exploring new territory calls for a guide that can demonstrate the method, help the researcher avoid pitfalls and have the leisure to scan the countryside, meet the natives, and interpret the experience. In my particular case, I had the strong desire to explore the management of knowledge workers using the longitudinal case method. Mastering this method would complement my current skills, and I would become a more rounded researcher.



The craft of research also includes ethics which already were familiar to me. Though one may agree with Carnap (1935) that ethical propositions have no knowledge content, it would be wise to remember that ethical conduct constitutes part of the foundation for a research community of serious enquiry. Any publication has value insofar as the researcher reports honestly on the method applied and the results obtained. In seeking recognition, the researcher has to balance the natural inclination to present the research in the best light in order to persuade colleagues and referees that the work is worthy of publication, with the requirement for full disclosure. At first glance, this appears to be easily achievable, but in practice researchers apply their method and achieve understanding through an untidy non-linear process of research. To some extent, all research reports are retrospective systematisation that emphasise the rational and the logical. This reinterpretation is part of the knowledge process (Miles and Huberman, 1984), and facilitates the reader's task of assimilating the research exploit and findings. But the final document leaves the wrong impression. A growing number of researchers have admitted the "craft" aspect of research (Miles and Huberman, 1984; Pettigrew, 1985).

Confidentiality also has craft aspects. Offering confidentiality is straightforward: the person's name, the company's name, and the personal contents of the interview are kept under lock and key. Similarly, confidential documents are reported on in an oblique manner. The company is shown the preliminary report to check for inaccuracies and for possible misrepresentations that may harm the firm's public image. However, once the work is in process, and the participants are comfortable and interested in the results, confidentiality requirements decrease. Achieving these lower requirements permits reporting the organisation's name in the public domain

and adds considerably to the value of the findings. Checks for reliability become much easier, and future work can build on a more definite foundation.

### **ASSUMPTIONS ABOUT THE WORLD**

Every researcher operates within a framework of epistemology, but rarely exposes it. This lacuna is understandable because most of the time the researcher operates within a specialised field and dialogues with others who share the same framework. In my case, I take as given that the physical world exists and that persons composed of mind and body operate within it as purposive and enquiring creatures. Persons are assumed to be interpreting their environment on an on-going basis as they seek to understand, shape and appropriate parts of it (Whitehead, 1938).

While persons are thinking creatures with self-defined aims, organisations do not think (Lawrence et al., 1988). Organisations are complex entities operating within an environment, and can be described in terms of resources, structures, policies and practices, activities and events. But their purposes and projects are determined by human actors within and outside the organisation. Only persons give and sustain meaning. Thus business strategy and the related construct of skills supply strategy reflect a particularly human concept. Was something intended and deliberate? Purpose also can be forgotten through neglect and constant repetition due to the failings of the human attention process. Furthermore, purpose may be shaped opportunistically when participants witness events which prove to be advantageous for the firm, and management subsequently adopts the pattern of events as a formal policy or strategy (Mintzberg and Waters, 1985). Strategy as emergent or intended is assumed to be influenced by the bounded rationality of the actors (Simon, 1957).

## **ADOPTING CONTEXTUALISM**

According to White (1955), the 19th century philosopher Friedrich Hegel is responsible for the importance given in the 20th century to studying ideas, activities and events contextually and historically. He gave primary attention to change and development, and his famous dialectic of logic was rooted in history. More recently, Pepper (1942) argued that all search for knowledge is guided by an underlying world hypothesis. The most widespread in our technological age is that of Mechanism, of law-like relationships between classes of phenomena, with truth demonstrated by cause and effect. An alternative and equally valid world hypothesis is that of Contextualism where events are studied in their setting. Truth is determined by qualitative confirmation because the context continues to change, obliging knowledge to change with it.

Within the social sciences, leadership was given by the ethnographer Malinowski in the early 20th century (Ellen, 1984). His method of participant observation obliged the researcher to understand first hand the community under study. As for the science of organisational studies, longitudinal case studies were an odd occurrence, but their numbers have grown significantly in the 1980s (Pettigrew, 1990).

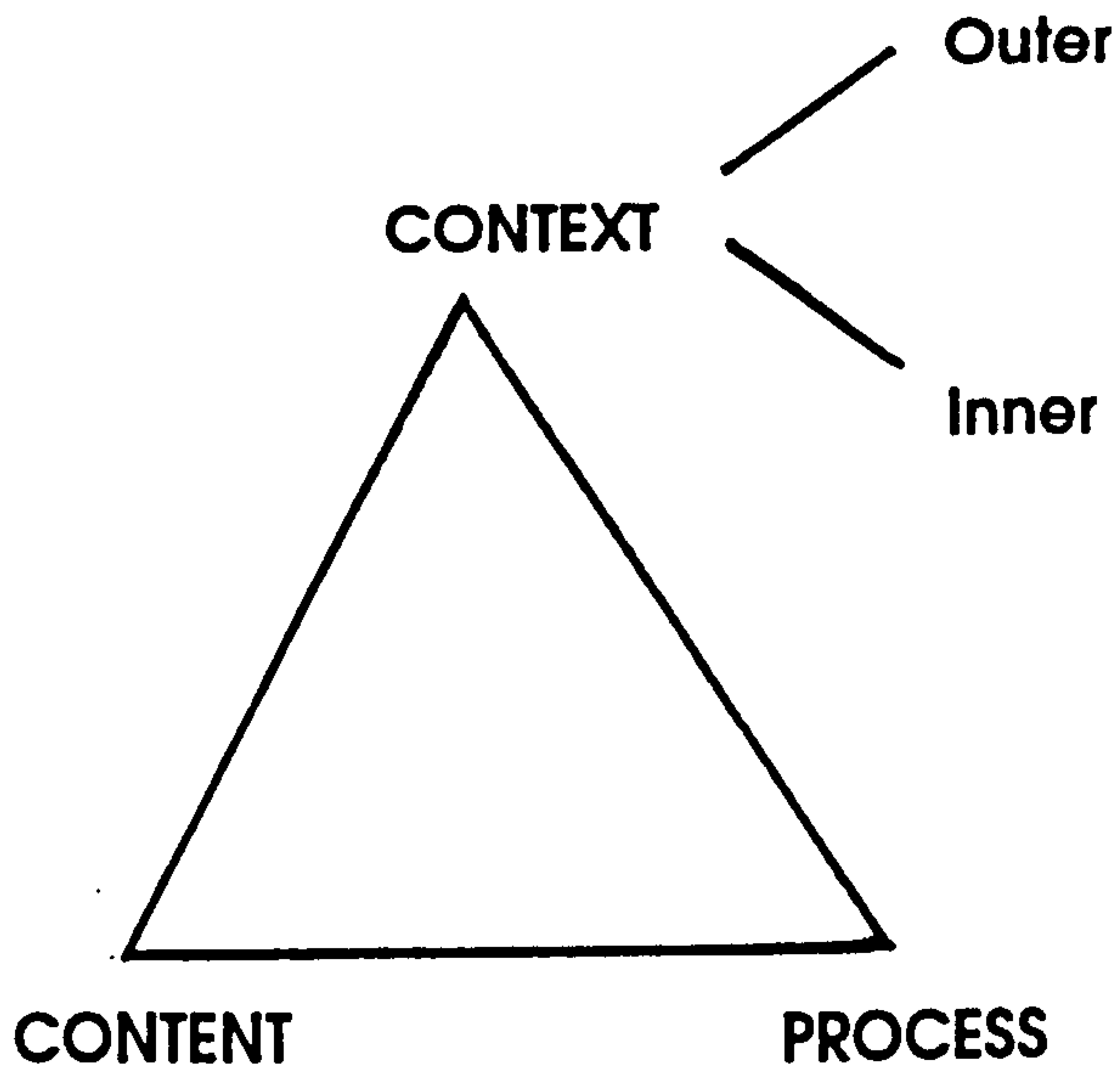
Polanyi (1957) strongly favoured a historical and comparative analysis of economic activity, but ignored the variety of economic organisations which have operated and changed over time (Lie, 1991). Both Granovetter (1985) and Lie (1991) have argued that economic activity, whether in the shape of markets or hierarchies, is embedded in concrete systems of social relations. Thus the study of economic activity requires attention to the context in all its complexity.



Contextualism as articulated by Pettigrew (1990) represents a framework for the study of organisational change. An analysis of the interplay among the content of change (WHAT), the context of change (WHY), and the process of change (HOW) reveals the patterns that account for the change. Figure 3.1. outlines the framework in relation to this dissertation. The content of change refers to the specific topic of interest and the changes that are taking place. In this case, the content is composed of skill supply patterns and the hard and soft benefits that compose the retention dimension of these patterns. Changes in these patterns and the benefits offered are described.

The context of change is composed of an outer and inner component which represent features which can facilitate change or can hamper and block it. These contexts also undergo change, and can become more favourable or less so over time. Thus skill supply patterns and the packages of hard and soft benefits are nested within a changing organisation (inner context) which can be described in terms of history, business strategy, structure and work organisation, culture, and human resource management policies and practices. There also exists a larger dynamic outer context within which the inner context is nested: economic cycles, political formation, technology, product/markets, and labour markets. Changes within the outer context can provoke changes in the inner context, but the pace of change in the outer context may be slower or faster than within the inner context because of particular features operating in the latter. There exists some interpenetration between the inner and outer contexts, and sometimes the direction of change can be from the inner context outward as, for example, when a firm leads the industry in innovation, or when large firm overwhelms a specific labour market. But most of the time, the organisation exercises a low level of influence on the outer context. The idea of receptive and

**FIGURE 3.1:  
 OUTLINE OF CONTEXTUALISM FOR THE STUDY  
 OF SKILLS SUPPLY STRATEGY**



<b>OUTER CONTEXT</b>	General Economy Industry Composition Political Formation Technological Developments Products & Markets Local and National Labour Markets Geography
<b>INNER CONTEXT</b>	History of Organisation Business Strategy Management Style & Leadership Structure Work Organisation Managerial & Professional Culture HRM Policies, Programmes & Practices
<b>CONTENT</b>	Organisational Skill Base Scarce and Critical Skills Skill Supply Patterns Combination of Hard & Soft Benefits
<b>PROCESS</b>	Events in Time Action & Reaction Product Champions Perceptions & Assumptions Values Roles Legitimisation

Source: Adaptation of Pettigrew (1987).

unreceptive contexts for change draws heavily on the work of Kurt Lewin (1951) on social force field analysis.

The third leg of Contextualism, the process of change, is concerned with the patterns of actions and reactions of the participants and interested parties. The researcher can bring to bear whatever theories of change that help explain the findings, such as decision-making and power relations, but also pays attention to the management of the process itself. For example, who assumed responsibility for skills planning, how did they become responsible, and how did they drive forward their change agenda? How was the skills strategy given legitimacy? How was the meaning of lifetime employment altered to justify the new skill supply patterns?

Examining the content, context and process of organisational change suffers from complexity, but one must keep in mind that the organisation under study is itself a complex entity. Successful research depends to a great degree on the craft skills of the enquirer, and the Ph.D. supervisor plays an important role in elucidating and demonstrating the methodology. A simpler approach, such as contingency theory applied to strategic HRM (e.g., Schuler and Jackson, 1987; Fombrun et al. 1984), would be more manageable because the static criterion of fit predominates and it is assumed that management can pick and choose from a menu of HRM elements to maintain a fit with the changing business strategy. This approach does not do justice to historical influences and the past patterns of change that condition the present. It makes little attempt at clarifying how the new HRM configuration comes to be in terms of sequences of events and actions both influencing and shaped by the inner and outer contexts of the organisation.



## APPLYING CONTEXTUALISM

The study of organisational change as a process within a context has made some progress in the 1980s, but the knowledge base remains rudimentary. Skill as a strategic HRM concept has been given little attention. Therefore, important contributions can be made in the description and analysis of the context of a skill-based strategy, and in the development of organisational concepts and theory for the understanding of the management of skills. In order to make such contributions, longitudinal and comparative case studies are required (Miles and Huberman, 1984; Eisenhardt, 1989b; Pettigrew, 1990). These qualitative studies would facilitate a wide scope of exploration and establish an adequate data base from which to recognise patterns in the content, process and context of change.

This researcher assumed that a longitudinal study emphasised the historical dimension: the mapping of events and actions in their changing contexts over a significant period of time, say 5 to 10 years, in order to see patterns. Firstly, this means capturing the story of the organisation. Secondly, the analysis of patterns reveals the dynamic relationships among actors, events and their context. Various means were available to collect this historical data, from actual observation to the study of documents. With limited time available, it was decided that interviews of persons with long experience within the organisation coupled with corroborating written sources of information would be sufficient to capture the organisation's past. These sources of information are subject to "doctoring": participants choose the story they wish to relate and annual reports deliberately project professionalism and success. However, even actual observation over time is influenced by the character and intentions of the observer. Furthermore, the past is an abstraction produced by memory and by people's attempts to make sense of the present and to prepare for an

uncertain and abstract future. Similarly, through this dissertation, this researcher attempts to make sense of the organisations under study as part of the ever present sense-making of the human community.

Pragmatic concerns also dictate rapid data collection. Within a three year Ph.D. programme in organisational studies, a longitudinal study has a particular meaning. Entry into an organisation takes six to twelve months, and the equivalent time is set aside for the writing of the dissertation. In doing more than one case, the time pressures increase, and the time available for real-time data collection in any one organisation shrinks. Interviews and review of documents can accommodate this time schedule.

Dimension of Time. Strategic change takes place at variable rates, sometimes slowly and at other times quickly (Quinn, 1980; Doz and Prahalad, 1987; Pettigrew, 1987). In order to witness patterns of change, a large time span must be investigated. Skinner (1981) believed that strategic HRM involved a seven year time horizon. Mills (1985) reported that some U.S. firms linked their personnel plans to the business plan covering three to six years. These intentional plans are part of a dynamic process with emergent elements, and with actions and reactions that become visible if enough time elapses. Too short a period could give the impression of stability and continuity when a larger time period might reveal significant change. The reverse could also happen, with a period of significant change masking periods of continuity before and after. A ten year span appears to be in order. The world-wide recession at the beginning of the 1980s and the arrival of Thatcherism in 1983 reinforces this choice. Thus, the cases would cover the early 1980s up to 1991 when both historical and real-time information would be collected.

Dimension of Space. The main focus of the investigation is the organisation. Three comprehensive cases (25 interviews per case) preceded by a pilot study were considered sufficient for comparative purposes. It was decided that only large firms operating in the information technology (IT) sector of England would be chosen. Because of the international nature of both R&D and the IT sector, attention would be paid to both the national and international context. Labour markets, on the other hand, are known to be primarily local and national. As for the organisation itself, installations typically are dispersed. The researcher was prepared to travel throughout England.

Choice of Organisations. The initial choice was between large and small firms. Some research had already been done on strategic HRM in large organisations, and was useful in defining and situating the concept of retention mechanism and packages of hard and soft benefits (Hendry and Pettigrew, 1990). The second choice was the specific firms; obtaining access proved to be a process of negotiation. The network of associations of the Centre for Corporate Strategy and Change was used to introduce the study and solicit participation. The arrival of the recession and structural changes taking place within many firms made this a long process. Some firms such as Olivetti refused immediately; others refused after a visit to their R&D installation (Hewlett-Packard) or their head office (ICL). In time, firm commitments were obtained from IBM and BT. The participation of RSRE was serendipitous and circuitous: a chance encounter of an enthusiastic product manager on the plane, and gradual access through a senior line manager prompted by the product manager.

The original design was composed of three large firms operating within the IT sector of England. In the end, three large organisations participated, all major players in the IT sector with R&D facilities composed of approximately 2000 professionals and



managers. All had a large internal labour market whose management was undergoing change in response to skill issues. However, they straddled both the private and public sectors, and engaged in different stages of R&D. This "emergent" element helped to create the following design:

**IBM:** Private sector organisation with an important R&D division emphasising development.

**BT:** Public sector organisation that underwent privatisation in the 1980s; it had an important R&D division and put more emphasis on development.

**RSRE:** Public sector R&D facility which traditionally emphasised research and which gradually took on private sector practices in the late 1980s.

This combination of cases proved to have several desirable qualities, and constituted a theoretical sample as opposed to a random or systematic sample (Glaser and Strauss, 1967). All of the organisations had undergone important changes which impacted on the R&D operations. This commonality facilitated theory-building across cases; each case was treated as a separate opportunity for the creation and refinement of constructs on skills management (Glaser and Strauss, 1967; Eisenhardt, 1989b). The different emphases on R and D (big R and little D or little R and big D) widened the applicability of the findings. Similarly, the sampling of both the private and public sectors fit well with the broader 1980s trend of the enterprise culture that spilled over from the private to the public sectors (Wilson, 1992). The RSRE case could shed some light on the BT case insofar as RSRE represents what BT might have been if it remained within the public sector.

Data Gathering - Interview Protocol. The main instrument for collecting data was the interview protocol, a comprehensive list of questions designed to uncover specific information on the content, context and process of the management of skills (see Appendix 3.1). Questions were clustered under headings which reflected the main

organisational concepts which would help to build the case study: company and strategic overview, skill requirements, skills availability, skills supply strategy, management of the internal labour market, turnover, human resource management, human resource development, management style, project management, network management, and questions for employees with key skills. No one individual answered all of the questions. Choice of questions depended on the person's position and location in the organisation. Typically, the same questions were asked of two or three persons. Follow-up telephone calls were made to collect additional information as required. The pilot study had indicated that close-ended questions were appropriate to keep both the researcher and the interviewee on topic. Both the pilot study and the first case (RSRE) pointed out the need for additional questions which were added for the subsequent cases.

Data Gathering Within RSRE. A total of 25 persons were interviewed during May and June of 1991, representing 40 hours of data collection, most of which was tape recorded. Each interview lasted about one hour, and was transcribed by the researcher or a paid assistant.

All interviews took place on-site and conducted in private. The site was visited, as well as the offices and the research labs. In addition to the formal interviews, conversations in the cafeteria took place frequently, usually with one of the participants, sometimes with another employee, and covered topics that were being highlighted in the interviews or impressions that needed verification. Similar incidental conversations took place at off moments during tours and in going from one location to another. At all stages of the interviews, current and historical documents were collected, mostly annual company and R&D reports, personnel related reports, and task force reports.



The researcher was guided by four sampling assumptions:

- (1) The plurality of views within the organisation can be captured by a broad vertical and horizontal sample.
- (2) Areas undergoing high levels of change are more likely to have visible skill issues and to foster skill supply interventions.
- (3) Organisational insiders are in a privileged position to identify potential participants currently facing skill issues and could facilitate their participation.
- (4) HRM activities are shared by line and staff managers.

Initially, general documentation was obtained by mail followed by the interview of a senior line manager of the establishment. This researcher summarized the nature of the intended study in detail (how the management of skills could support the business strategy of an organisation). Then, the contact person was asked to explain the functioning and structure of the organisation, the past and current strategic business issues, and the related skill issues. Choice of participants was discussed in terms of the following criteria: broad vertical selection of managers including both line and staff functions with emphasis on personnel and the research areas; a broad selection of managers and researchers in areas undergoing important changes which were raising skill questions. The contact person and the researcher agreed that the best approach was to set a first round of interviews of the more senior managers in order to obtain an overview of strategic issues and obtain their support: 3 senior managers (including the contact person) and 6 middle-line managers. Thereafter, interviews in those areas which seemed promising and open to participation would be set jointly with the local manager in order to go deeper in the organisation.

Because of the contact person's very senior position and the civil service way, the first round of interviews were scheduled without giving people a choice. A one-page



description of the study (prepared by the researcher) was sent to each participant along with confirmation of the interview time. With the active support of three business unit directors and some lateral referrals, 16 additional interviews were conducted with 8 middle managers in support functions (personnel and other), 4 first-line managers, and 4 outstanding scientists. Again, participants were not given any choice.

Data Gathering Within BT. The above experience with RSRE produced a sizable body of data and information which proved to be satisfactory for case writing. The above procedures were repeated for BT with some modifications. Thirty interviews took place between September and December 1991 for some 40 hours of tape. A senior personnel manager within corporate headquarters acted as contact person. The first round of interviews included 2 personnel managers within corporate office and 2 senior personnel managers within the divisions (R&D and Worldwide Networks or WN). The second round of interviews involved 26 persons:

In headquarters, 4 managers in personnel and related areas;

In R&D, 2 middle-line managers, 5 middle-support managers, 3 first-line managers, 4 researchers and group leaders for a total of 14;

In WN, 3 middle-line managers, 4 middle-support managers and one first-line manager for a total of 8.

In general, interviews were voluntary and consent obtained by phone by the delegate of the contact person, followed up with written confirmation accompanied by the description of the project. However, within R&D, the senior personnel manager circulated an invitation to senior middle line managers to participate. Only those who responded positively were interviewed, followed by a second round of interviews deeper within their areas which were assigned without choice. The researcher noticed improved quality of the data collected when compared with the RSRE case

due to a revision of the interview protocol and the growing experience of the researcher.

Data Collected Within IBM. Twenty persons were interviewed, and one group interview took place, between February and April 1992, representing 30 hours of data. A senior personnel manager within corporate headquarters was the contact person. Obtaining consent was similar to that within BT, a mixture of voluntary and involuntary participation. The first round of interviews involved 2 persons: a senior personnel manager at headquarters and another within Hursley Lab. The latter interview took place as part of a group discussion with 3 middle-line managers invited by the interviewee. The researcher was surprised by the group format, and accepted it as a way of obtaining wider entry into the organisation. The second round involved 18 interviews including 3 personnel managers at corporate headquarters and 15 interviews in R&D: 3 middle-line managers, 6 middle-support managers, 3 first-line managers and 3 researchers.

Data Analysis. The transition from data collection to data analysis was in one sense overlapping and in another distinct and sequential. During the data collection, the researcher noted in writing "exciting" ideas and impressions, identified key themes and events, and formed an overall assessment of the organisation. These notes were made in hotels, on the train and at the local pub. Subsequently the case was written in an inductive manner while the "insights" both inspired the write-up and were tested against the data base.

Because of the time-consuming task of transcribing the taped interviews, the systematic write-up took place, for the most part, only after all of the data was accessible. In each case, the process began with a review of the documentation

collected (interview transcripts, in-house and annual reports, newspaper and magazine articles). As obtained, the documents were sorted and placed in separate files according to main headings (history of organisation, business strategy, HRM, R&D) as much as possible. Thereafter, a descriptive case was written by reviewing the files in a sequence corresponding to the case headings. The chronology of main events for the 1980s and early 1990s was established during the data collection to facilitate the interviews, and now was revised. As a longitudinal study, this chronology and the descriptive case built around it created the foundation upon which inter-related events and activities were examined (Miles and Huberman, 1984; Van de Ven, 1987; Pettigrew, 1990).

Triangulation was used regularly and flexibly (Fetterman, 1989, Brewer and Hunter, 1989). Three independent sources of information were sought to confirm events and measure the consensus (or lack of it). Different types of information were compared, such as interviews from different locations within the organisation, interviews versus documents, and internal versus external documents. Because of security constraints, little use of internal documents took place in RSRE. Ethnographic information gleaned through observation was used in a less systematic manner, and was helpful in obtaining a general sense of the organisation and its culture, and in verifying the details of the work settings and the availability of resources.

When triangulation indicated consensus on a topic, the researcher would accept the view expressed. However, when divergence was evident, the researcher reconciled the conflictual evidence by searching for different uses of language and different perspectives. For example, participants situated events according to when they had an impact on their lives. If they were involved in the early stages, they would speak



of this period as if the event was a wide phenomenon instead of a localised one. In contrast, documents would report on the same event after it was beyond the emergent phase and well established. In this case, the differences would prove to be superficial. At other times, the divergence was due more to different perspectives created by the location of the participants in the organisation and their different preoccupations and values. Such differences were treated as part of the plurality of the organisational social reality that participants individually and collectively created.

The cases were written in the following order: RSRE, BT, and finally IBM. The initial descriptive case of RSRE suffered from unfocused comprehensiveness. It was voluminous and much was included that did not pertain specifically to skill issues. The revised case was shorter and more analytical as the researcher tried harder to build on the list of hard and soft benefits created in the pilot study, and to relate these retention mechanisms to the business requirements. While the construct of SKISS had not yet emerged, it was noted that management interest in outflows of employees pointed out the limitation of linking retention mechanisms directly to business strategy. Changing packages of hard and soft benefits were not an adequate construct for the analysis of the business issues confronting RSRE.

In light of the RSRE experience, the interview protocol was revised with more questions on the importance and management of skills. The next case, BT, followed the same procedure, and again a weighty descriptive case was written. However, this time the malaise that was evident in the first case (RSRE) was confirmed and a conceptual solution suggested itself. The revision of the BT case at a more analytical level was facilitated by the adoption of SKISS as the core construct. But first, a new literature review was completed to demonstrate that the construct had academic

relevance and support. Second, the analytical procedures recommended by Miles and Huberman (1984), notably event listing and causal networks, were brought to bear on the descriptive case. These techniques facilitated careful attention to the chronology of inter-related events across levels of analysis, and helped to reduce and summarize the description. The researcher found that the tables and figures created helped to raise the level of analysis, but were in themselves only an intermediate step. Needless to say, the third case, IBM-UK benefited greatly from this analytical progress, and the first case, RSRE, was revised. In order to make a stronger argument for the existence of SKISS, the cases are presented in the thesis in an order opposite to their chronological creation: IBM, BT, and finally RSRE. Both IBM and BT were sophisticated firms undergoing broad changes with evident skill implications, whereas RSRE remained part of the civil service.

Feedback to participants was used to check on the accuracy of the information collected, and to reward participants for their time and efforts. In RSRE the contact person was given a verbal report on completion of the interviews, and a descriptive case a couple of months later. Two workshop presentations were given to the participants who confirmed the findings and appreciated the sense-making of presenting events in the context. In BT and IBM, a descriptive case report was sent to the contact person and to the senior personnel participant in each division and business area. They declined the workshop offer. A list of participants accompanied the report, but it was up to Personnel to distribute it more widely.

Participants who saw the report found the historical perspective captivating, as if they had discovered a part of themselves that they had lived through but had not fully appreciated. Though some differences of opinion remained, they verbally confirmed the contents of the case, and for IBM and BT, they found the analysis

pertinent. Interestingly, middle managers were more interested in the process of the research which was seen as an opportunity to assess current views and identify possible adjustments for pressing business requirements.

The above pertains to within-case analysis. The across-case analysis was thematic and based on a search for patterns in the content, context and process of change. Again, the researcher had spontaneously reflected on the themes before the three cases were fully analysed. The initial draft of a chapter was written off-the-top, and revised on the basis of the literature reviews already completed. Thereafter, a case by case comparison was made as a test of the applicability and comprehensiveness of the theme. Furthermore, some thematic chapters were elaborations of a conclusion which needed to be informed by the literature. This was the situation when trying to explain skill management practices and the difficulties that managers had in discussing skills. Thus, the between-case analysis was an interactive process of the deductions and inductions of the researcher stimulated by the analytical cases and informed by the academic literature.

Identifying Skills Supply Strategy. As presented in Chapter 2, a recognizable pattern of changes in HRM policies, programmes and practices would qualify as a SKISS if four criteria were satisfied: strategic linkage, managerial intent, coherence of HRM elements, and consistency of managerial effort. While these criteria could apply to IBM, they are more difficult to satisfy in BT which has been in the private sector only since 1985. Similarly, RSRE has adopted some private sector practices only since 1985. Whether BT and RSRE can be said to have a business strategy remains to be seen. Alternatively, the creation of a business strategy within these organisations might prove to be fertile ground for a radical reappraisal of the work organisation and the emergence of SKISS.



Pilot Project. In June 1990, a pilot study was undertaken in a metropolis of Ontario, Canada. Because of the 80,000 word limitation of this thesis, only a summary is presented. The researcher was pursuing limited goals: become familiar with field work and case write-up; identify the hard and soft benefits acting as retention mechanisms; and situate these mechanisms within their organisational context. Ten large firms were contacted before obtaining the agreement of two of them. The contact person was a senior personnel manager. A protocol of fifteen broad questions guided the interviews; six were conducted in one firm and eight in the other. Interviews were supplemented by HRM documents, annual reports, and news clippings.

A number of lessons were learned which were useful for the main study. A classification of hard and soft benefits offered by large high technology organisations was empirically derived. The pilot study also indicated that hard and soft benefits were either addressing an employee "care" need or a business and performance requirement. Furthermore, changes in a specific benefit could be care-driven or business-driven independent of the original purpose of offering the benefit.

The importance of collecting ample data in order to follow the evolution of changes in benefits in relation to the different levels of context became evident. More interviews and historical documentation would be required. In order to succeed in collecting complete data for the main cases, a detailed interview protocol was in order. The researcher had adopted an open-ended question format as the follow-up to the initial answers given, and this proved to be a dangerous practice. Too often, the discussion dealt with interesting but tangential topics. More closed-ended questions would ensure that the desired topics were covered. Also, in order to supply quotations from

the interviews, tape-recorded interviews would be in order. The researcher's memory was inadequate to the task.

These Canadian firms were relatively young, 20 years old, and continued to be influenced by their founders. In contrast, the British organisations which were targeted for the main study were much older, over 40 years old, and presumably the founders would have less impact on business priorities and operations in the 1980s. Several other contextual features would also differ because of the national political, social and economic setting. It was decided to use the pilot study as an exploration of retention mechanisms and the case method, and not as part of the main research data base.

The next section presents the classification of hard and soft benefits which was adopted for the three main cases.

### **HARD & SOFT BENEFITS**

Hard benefits proved to be difficult to organise. A subsequent literature review uncovered the framework provided by Blakin and Gomez-Mejia (1990). With a modest modification (e.g., adding contract type) it was found to be adequate for case analysis. Hard benefits have three categories:

- base salary (market position).
- benefits
- incentives such as bonuses and profit sharing
- importance of each of the above in the total compensation package.

These hard benefits are accompanied by a variety of pay policies:

- type of employment contract (permanent, personal or term)
- risk sharing between employer and employee
- internal consistency
- pay secrecy
- pay for performance
- pay decentralisation
- egalitarian pay (perks)
- participation in pay decisions
- job-based vs skill-based pay
- long-term vs short-term pay orientation.

The pilot study identified that hard benefits were very important to recruitment and played some role in retention. Participants also believed that numerous soft benefits contributed to the retention of employees either directly by offering valued rewards or indirectly by improving morale. Thirteen soft benefits were identified which can be grouped into four categories:

- (1) Primary performance-related benefits
  - challenging work
  - positive work environment
  - recognition for employee contributions



- (2) Secondary performance-related benefits
  - enriched training
  - flexible work arrangement (teleworking)
  
- (3) Communications-related benefits
  - informal listening
  - formal listening
  - employee involvement
  
- (4) Care-related benefits
  - employment security
  - career development
  - successful & responsible image
  - quality & continuity of community

## **THE LONE SCHOLAR**

This dissertation is the product of the solitary scholar working under the supervision of other more skilful scholars. In one sense, this solitary task is most appropriate as an apprenticeship with mastery as the goal. Schon (1983) and Pettigrew (1985) emphasised how the researcher operates reflectively to understand the situation. The ability to frame a problem out of a situation and to seek its solution constitute the professional's reflective skill. The professional imposes meaning through his or her singular perspective, and hopefully provides a fruitful way of handling the situation. The shaping of the professional involves singular engagement in this

process, but with some guidance which diminishes as the student gains in mastery and becomes the expert of the dissertation.

Some may argue that the single perspective suffers from undue bias that can be corrected by multiple researchers. Such an approach is feasible in a coordinated laboratory or well endowed research centre. Within the social sciences, multiple researchers do create a forum for sharing and testing interpretations, and enriching theory-building (Eisenhardt, 1989), but their plurality can also introduce new variability in the data collection and write-up. As for this researcher, he benefited from regular discussions with his two supervisors who helped to clarify and test data interpretations.

The dissertation can be criticised as lacking in generalisability. Given that the topic of skills supply strategy has been the subject of little research, the tradeoff was made in favour of a valid empirical and conceptual contribution. The small number of cases (three preceded by a pilot study) can be defended by the task at hand: a Ph.D. thesis that normally lasts three years of full time study, not a lifetime.

## **CONCLUSION**

This chapter describes the research process as both a very personal experience and a academic investigation within the social sciences. The Ph.D. must shape the future professional by developing and perfecting research skills. It must also produce a significant contribution to the academic knowledge base. The weaving of these two themes created this dissertation: a longitudinal and comparative case study of three large organisations operating in the IT sector in England. Contextualism was

adopted as both a framework to study change management as well as a method by borrowing heavily on the field practices of anthropology and sociology. The research process was described in sufficient detail so that the reader could appreciate research as a practice or craft and not some idealized method.

Contextualism as a framework was found to be a useful starting point and a flexible approach to deal with the emerging constructs. However, the researcher was obliged to cultivate a new way of viewing the world in terms of the content, context and process of change. This overwhelmingly dynamic framework was stimulating but unfamiliar, promising but foreign. The shift to this new Gestalt took time and exacted a price. Undertaking a pilot project was a useful introduction to the method, and helped to operationalise the concept of hard and soft benefits.

Contextualism as a method had both strengths and weaknesses. The recommended taped-recorded interviews created too much data and appeared to be wasteful of time and energy. Initial interviews of key informants remain justifiable, but subsequent interviews not so. They could be captured by the more efficient technique of note taking during the interview. Ideally this would be done with a team of two researchers, one to do the interview, and the other to take notes. This solution was not possible for this dissertation, and the researcher's weakness for comprehensiveness increased his burden.

The transition from case description to analysis was a gradual and time-consuming process involving considerable learning. Perhaps this grind should not be rushed for fear of premature closure and inadequate learning. However, the method did not prove sufficient for the data reduction and summarization required. The specific procedures outlined in Miles and Huberman (1984) added the missing capability.



Part of the difficulty was the researcher's misunderstanding of what a comprehensive case constituted. In time, he learned to shift from comprehensiveness per se to comprehensiveness around a focal question and construct: identifying HRM patterns which could satisfy the criteria of SKISS, namely, strategic linkage, managerial intent, HRM coherence, and consistent managerial effort. Inevitably, some simplification of the descriptive case took place in the transition to an analytical case, but this loss was compensated by a gain in understanding of the strategic skill issues.

## **CHAPTER 4: IBM-UK CASE STUDY**

This chapter presents the case of IBM-UK, a firm noted for sophisticated HRM policies and practices, dynamic management, and mounting environmental pressures. It begins with an overview of the organisation and senior management, the environment and business strategy of the firm, and its organisational structure. The remainder of the case focuses on R&D, starting with a skills description of Hursley Laboratory. The case next shifts to the wider topics of skills supply and the ILM, and follows with the HRM context and an evaluation of the evidence for intentional skill supply patterns. In the next section, changes in hard and soft benefits are documented, and their support of the business strategy assessed. The case ends with an evaluation of the skills supply "strategy" and the influence of HRM as the context for skill supply patterns.

### **OVERVIEW OF THE ORGANISATION & SENIOR MANAGEMENT**

The multinational International Business Machines (IBM) Corporation has its headquarters in Armonk, New York. The firm entered the 1990s with 69\$ billion in revenue composed of sales (64%), support services (16%), software (14%), and rentals and financing (14%). 350,000 employees were employed and more than 10,000 different computing products were offered as packages of business solutions. The 1990s began with years of crisis. IBM was guided by its CEO John Akers since the mid 1980s. Breaking with tradition, he was replaced in 1993 by an outsider, Louis Gerstner, previously chief executive of RJR Nabisco Inc. with no experience in the computer industry. His immediate priority was bringing IBM's costs in line with those of competitors.

<b>Year</b>	<b>Net Loss (\$ Billions)</b>	<b>Restructuring Costs (\$)</b>	<b>Separations &amp; Relocations (\$)</b>
1991	2.8	3.4	2.2
1992	5.0	11.6	3.0

IBM - United Kingdom Limited shared in the above debacle. This fully-owned subsidiary was established in 1951 with its headquarters currently in Portsmouth. Hursley Laboratory was set up in 1958 and remains the largest IBM lab outside of the U.S.. Revenue growth took place throughout the 1980s, but profit margin shrank and reached 9.7% in 1990. In 1991 IBM-UK experienced a net loss for the first time, including a restructuring cost of 184 million pounds. Downsizing affected all areas.

Senior managers within IBM-UK were nationals groomed within the world-wide IBM organisation and culture. They shared IBM's basic beliefs of respect for the individual, service to the customer, and pursuit of excellence, and assumed continuity in IBM's market dominance. They adopted the IBM persuasion style; an internal champion was required for any change effort. Small incremental changes were preferred which could be absorbed by the company culture.

The 1980s was noted for minimal change in the executive ranks of IBM-UK. A gradual grooming of the leadership took place through the positions of chairman, chief executive and managing director. Edwin Nixon, Anthony Cleaver, and Nick Temple occupied in turn the position of chief executive. Leonard Peach was Director of Personnel & Corporate Affairs, with a three year secondment in 1986-89; John Steele was acting director for this period. There was some turnover in other positions due to retirements. In contrast, the Director of Hursley Lab was replaced every two years or so to reflect business requirements and executive



development within the network of IBM labs. Geoff Robinson was director at the beginning of the study, and was replaced by Phyllis Byrne of the U.S. in 1992.

## **ENVIRONMENT OF THE ORGANISATION**

Throughout the 1960s and 1970s the growing computing manufacturing industry was dominated by IBM and its mainframe solutions. The trends of the late 1970s and 1980s led to restructuring of the industry, and IBM's loss of pre-eminence:

- Rapid innovation in power and minaturization (portable workstations and minicomputer);
- Personal computers (PCs) became a commodity;
- Emergence of an information technology (IT) market based on networking through telecommunications and value added services;
- Proliferation of market niches (eg., software, distribution, consulting) and competitors able to match and often outperform IBM;
- Open systems preferred by governments and consumers, whereas IBM emphasised proprietary hardware and software.
- IT skill shortages were identified, and both government and IT business leaders attempted to increase research activity and skills supply.

These six changes meant diminishing profit margins for hardware manufacturers and emphasis on volume sales. Proprietary strategies for the entire computing system (involving several components) became less viable. Ease of cloning and mimicking facilitated the entry of new competitors, and little protection existed under GATT. Lucrative market segments were concentrated in added-value

software and services, and flexible networked systems. Within this new environment, skill shortages were an issue as firms competed for skills that would help them grow.

Sparrow (1988) described 1981-82 as a period of profitless prosperity noted by increasing sales but decreasing profits because of international price competition and spiralling salary costs. Thereafter sales and profits improved for the industry as a whole, but the industry restructuring created on-going challenges for the large established firms. In contrast, the recession of 1990-92 hit the mature computing industry hard with negative growth and widespread losses. There was oversupply of pc's and postponement of major investments by organisations. The combined effects of recession and industry restructuring obliged all major hardware manufacturers to undergo downsizing.

## **IBM'S CORPORATE STRATEGY**

### **CENTRALLY-DRIVEN STRATEGY**

IBM and its subsidiaries pursued four explicit corporate goals in the 1980s: growing with the industry; product leadership across the entire product line; greater efficiency in terms of low-cost activities and the highest quality products; and sustained profitability. These goals presumed the continued dominance of IBM.

IBM's structure had three tiers: R&D was centralised on a world-wide basis with laboratories competing for specific missions; manufacturing was regionally based

with plants in each region covering the full line of products; and marketing and services was nationally organised though reporting to a regional headquarters.

The 1980s and 1990s witnessed the creation of relatively autonomous business units, the decentralisation of responsibilities from regions to national organisations, and the spinning-off of non-core activities. The 1991 restructuring aimed to create decentralised business groups for mature products as well. These reorganisations were part of an incremental change revolving around centralisation to decentralisation.

In order to increase flexibility and efficiency in the 1980s, IBM Europe created independent business units or centres serving all of Europe. IBM-UK performed some services on behalf of IBM Europe for customers throughout the region. It also had responsibility for supporting IBM world-wide in information services for internal use. Hursley Lab was expected to support these centres through involvement in multi-functional teams and in secondments. Relocation of world-wide headquarters of Communication Systems to London was announced in 1990. In parallel, the Lab adopted world-wide product missions in communications.

Throughout this time, IBM retained a complex structure that tried to balance market and production requirements at the national, regional and world-wide levels, to obtain the benefits of both specialisation and economies of scale. Corporate headquarters continued to play a dominant role. The painful lessons of the 1980s did not go unnoticed.

"If we look at the IBM of five years ago, we see a company concentrating in the research, development, manufacture and sale of IT hardware. Our service organisation was largely reactive...Moreover, the company had become a follower...and its structure had become overly bureaucratic." Nick Temple 1991 Annual Review, p5



The decade witnessed a gradual shift from IBM's proprietary strategy (Badaracco, 1991): the introduction of the IBM pc from off-the-shelf components; the development of the AIX network operating system software to compete with AT&T's Unix as the standard for open systems interconnection; buying growing quantities of components and technology from outside suppliers; and selling some of its components to rival firms to incorporate into their computer.

IBM entered the 1990s with a three-part strategy: (1) increased customer focus; (2) strengthening the product line; and (3) targeting ways of making the organisation more efficient, competitive and profitable. The three thrusts were linked by Market-Driven Quality (MDQ) and called for increasing individual authority (IBM 1990 Annual Report). MDQ built upon TQM and process management which were operating for some years.

IBM also continued to strengthen its presence in Europe. By the mid 1980s, European sales were growing faster than U.S. sales, and surpassed them in total sales in 1990. IBM began to decentralise to capitalise on this change. Headquarters of the Communication Systems Division moved from New York to London in 1991. Never before was a headquarters situated outside the USA.

Despite these efforts to sharpen the corporate strategy and culture, the media and financial analysts continued to criticise IBM's over-reliance on mainframe business, heavy bureaucracy and adherence to an expensive policy of lifetime employment (Financial Times, May 3, 1991; June 21, 1991; Nov. 21, 1991; Nov. 28, 1991; Globe & Mail, Aug. 4, 1992; Dec. 2, 1992; Jan. 23, 1993).

## **SUSTAINING R&D**

Consistent investment in R&D was seen as ensuring the firm's long-term growth and profitability. World-wide investment levels in R&D and engineering consistently averaged 10% with R&D accounting for three quarters of expenses and engineering the remainder. The R&D network grew from 24 to 36 labs in the 1980s. A few pursued cutting-edge research while the remainder were limited to development. Traditionally focused on mainframes and related applications, the R&D effort gradually was adjusted to cover the entire range of computer sizes. It was complemented by shifting alliances with other major computing firms such as Microsoft, Apple, Wang, and Siemen. These multiple alliances obliged the labs to develop managers and professionals able to function with external partners.

## **BUSINESS STRATEGY OF IBM-UK & HURSLEY LAB**

### **CUSTOMER FOCUS IN MARKETING & SALES**

Loss of market share and fierce price competition led IBM to study its competitors more closely (1985). These firms proved to have a lower cost structure: less overhead and support and more customer-facing employees in sales and related activities. While IBM was able to match their manufacturing performance, it suffered from an expensive and poorly deployed workforce. IBM-UK introduced the strategic push to change its workforce ratios in favour of customer-facing. Gradually more employees were redeployed and retrained, and cross-functional teams involving Hursley people became more numerous.

The pace of change slowly accelerated as there was continued management disappointment in corporate performance. The percentage of employees in

customer-facing areas of the business stood at 45% in 1986 and approached 60% in 1990. In 1991 IBM-UK outlined its Blueprint for the 1990s: customer-facing employees would reach 75% by the end of 1992. Under pressure to improve performance, the 5 year redeployment plan was accelerated to 2 years (1991-92).

The Blueprint also provided for more decentralised business groups focused on particular products or market segments. Greater management discretion included the right to combine IBM products and services with offerings from other companies.

## **INTERNAL EFFICIENCY & QUALITY**

Manufacturing Efficiency & Quality (1985). In the first half of the 1980s, IBM succeeded in lowering manufacturing costs through the introduction of continuous production and a constant drive for quality. Gradually process quality and ISO certification became the preoccupation of all areas in IBM-UK. However, competition from low cost firms was unrelenting, and IBM countered by creating closer integration of R&D with manufacturing to decrease product development cycle times and increase process quality. This integration was implemented principally by multiple cross-functional project teams and joint management teams.

Manufacturing Suppliers. With increasing automation (eg., robotics, automated material handling) and continuous manufacturing, the UK plants (Havant & Greenock) reinforced and organised their suppliers into a tighter network able to deliver on time and to quality requirements.

Support Systems. In 1984 IBM-UK installed the National Office Support System (NOSS). By the end of 1986 most employees were trained to make use of NOSS



for sending and receiving electronic mail and administrative support. In 1990 development of a modern on-line HRM system was initiated to replace the mainframe system in operations since the early 1970s.

## **SPECIALISATION AT HURSLEY LABORATORY**

While Hursley supported IBM-UK in Marketing & Sales (M&S) and manufacturing, its primary goal was product development for IBM Research Division. Within its network of 36 laboratories, missions were obtained competitively. While some laboratories like Hursley were successful in obtaining both hardware and software missions, most specialised in supporting a business line.

Hursley was mainly concerned with graphics displays and systems, direct access storage devices and programming. Customer Information Control System (CICS) was developed in 1975 and remained IBM's successful mainframe program package world-wide. It was constantly enhanced and updated, and occupied a third of the lab's workforce. Investment in buildings and equipment took place throughout the 1980s and the workforce grew from 1500 to 1700.

In 1983 and with the introduction of the IBM pc in Europe, Development and Manufacturing in the UK were brought under a single director. Growing cooperation between the two plants, the Lab, and suppliers took place. In 1988 Hursley moved its monitor development to the Greenock plant, and development of storage products, sub-systems and flexible circuits to Havant.

Hursley Software Mission (1990). IBM had been trying to penetrate the lucrative markets of software and computing services since 1980, and did make some

headway. But as usual, the firm moved slowly and by 1990 it was still refocusing its resources and efforts. In 1989, corporate office decided that Hursley would adopt a 100% software mission.

Hursley took on more global software missions, including responsibility for part of the software development of Communication Systems, IBM's networking products and services division. By 1990 Hursley had completed the transfer, and had world-wide responsibilities for transaction systems and voice-enhanced solutions. The following year, the downsizing of the Lab brought the workforce back to 1500.

Productivity Push (1991). The crisis of 1991 precipitated the massive exiting of people with careful attention to the retention of skills considered important for maintaining and enhancing business performance. Hursley transferred the employees closely tied to hardware development, but it still had numerous researchers and managers with a hardware background.

"If we are going to be affordable as a software development organisation, we need a higher level of productivity." 2nd Line Hursley Manager

## **BUSINESS STRATEGY & HRM IMPLICATIONS**

IBM's intentions to decentralise posed a serious challenge to the established HR policies which emphasise world-wide equity and security of employment. Meanwhile attention to efficiency and quality, and focusing the business functions called for sustained training and development of its workforce. High overhead costs were a pressing issue which could only be solved by downsizing. How could Hursley resize and reshape the skillbase at the same time? Some

managers wondered how successful IBM could be in preparing large numbers of displaced people for high levels of performance. The strategy also had an inevitable cost associated with the learning curve.

Despite the dissatisfaction of investors and investment analysts, senior management consistently defended the practice of full employment. The business crisis and restructuring of 1991 brought additional pressure.

"Having top-quality people...a true competitive advantage." John Akers, Chairman, 1990 IBM Annual Report.

"If further significant reductions are required, we will reassess full employment and do what is best for IBM." John Akers, Chairman, 1991 IBM Annual Report.

## **HURSLEY LABORATORY**

### **ORGANISATIONAL STRUCTURE**

The 1991 world-wide downsizing shifted Marketing and Sales (M&S) in IBM-UK from its geographically-based structure to one aligned with industry sectors (see Figure 4.1). The aim was a network of separate, self-contained businesses, supported by a service organisation. Rationalisation also was taking place in manufacturing. In 1991 the Greenock and Havant plants were being integrated, with common support and administrative functions. Each plant also absorbed the engineering support and workforce which was separated from Hursley Lab.

Product and market missions were reflected in Hursley Lab's structure with relatively self-contained business units except for some support functions



(personnel and finance) which were centralised in the Lab. Despite changing product missions and their involvement in marketing pursuits, the Labs structure remained relatively stable. In 1991 the introduction of a single coherent software mission, the spinning-off of hardware R&D, and the introduction of team working spawned a new structure (see Figure 4.2).

## **SKILLS STRUCTURE**

IBM-UK started the 1980s with a headcount approaching 15,000 (see Table 4.1). The firm underwent rapid growth after the recession and plateaued at 19,000. Downsizing began in 1990 and was pronounced in the next two years. Throughout the 1980s IBM-UK maintained relatively stable workforce ratios with 50% in M&S, 20% in Manufacturing, 20% in Administration, and 10% in R&D.

Hursley Lab started the decade with 1,400 people and underwent slow growth approaching 2000 in 1990 (see Table 4.2). The Lab was successful in obtaining a variety of missions, and more important for the long term, succeeded in achieving a profile in a few software areas, namely transactions management (CICS) and imaging. Most professionals occupied one of three job categories: planner, engineer, and programmer. The latter was by far the fastest growing group and outnumbered engineers by 1986. With the transfer of engineering support to the plants in 1991, programmers became the predominant skill group.

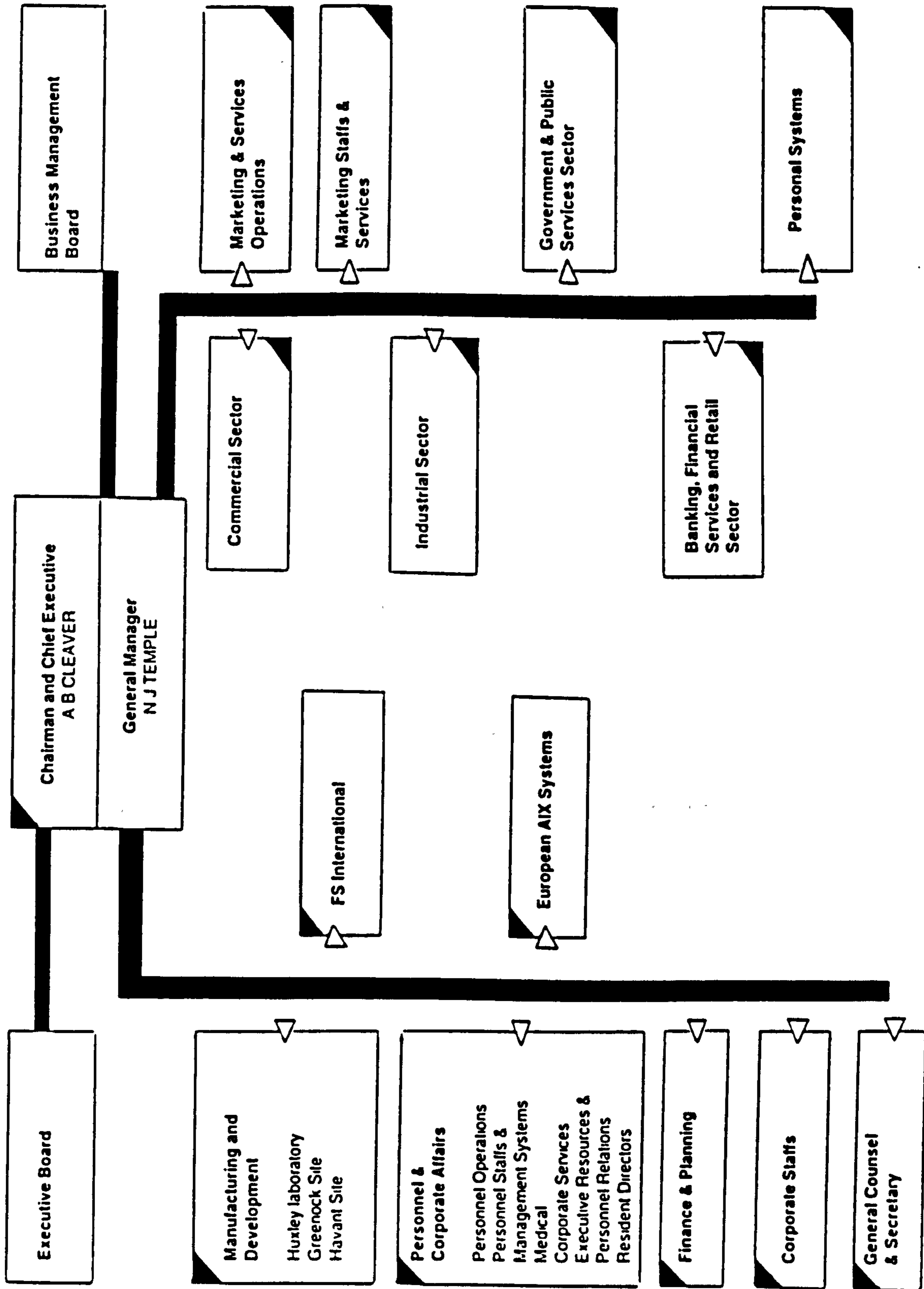
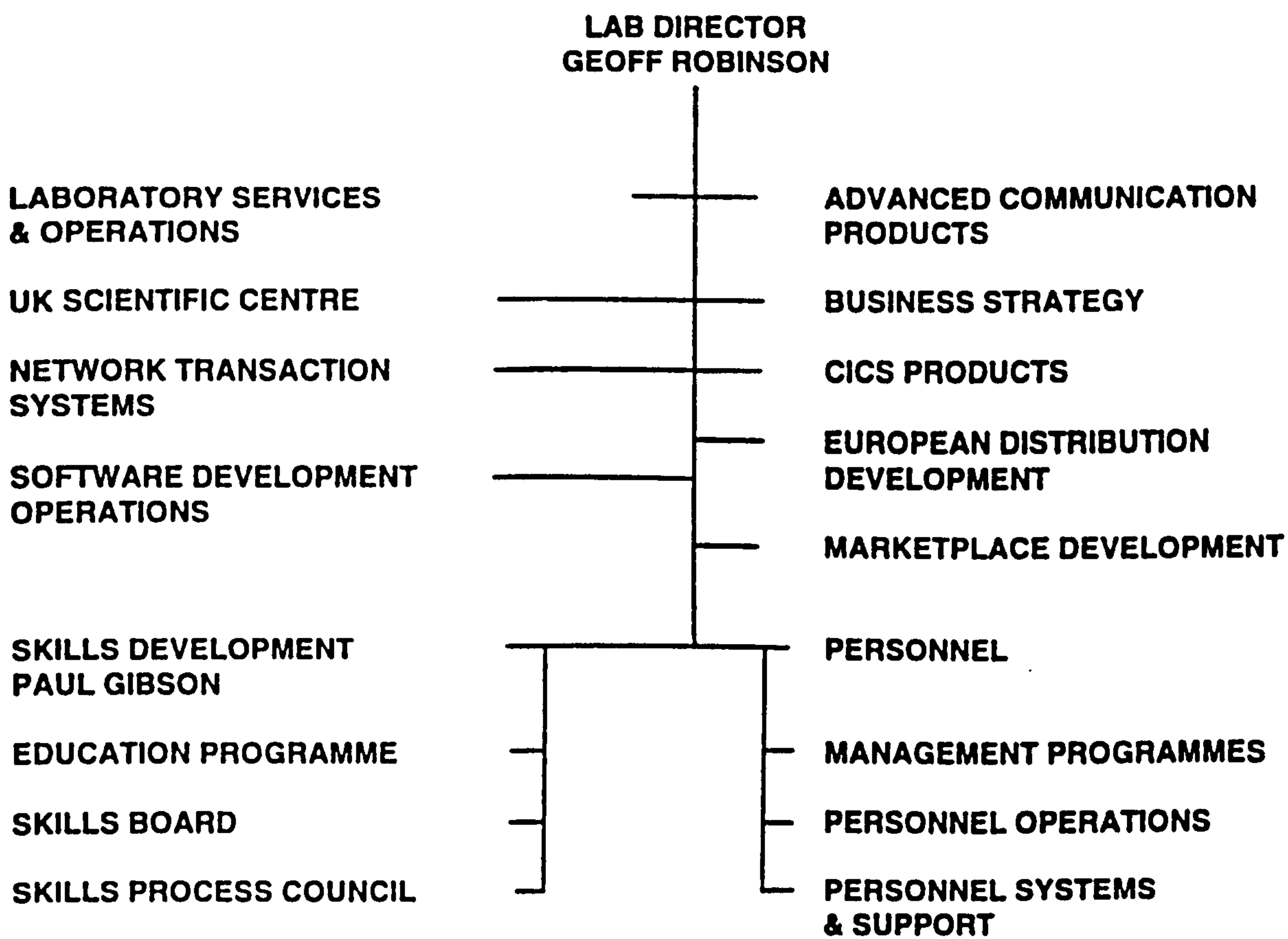


FIGURE 4.1 IBM-UK ORGANISATIONAL STRUCTURE - AUGUST 1991

**FIGURE 4.2. ORGANISATIONAL STRUCTURE  
OF HURSLEY LAB- JANUARY 1991**





**TABLE 4.1. IBM-UK WORKFORCE STATISTICS 1981-1992**

<b>Year</b>	<b>Total Recruitment</b>	<b>Graduate Recruitment</b>	<b>Workforce Turnover Year-End</b>	<b>Workforce Year-End</b>
1981	n.a.	n.a.	3.4%	14752
1982	600	90	3.1%	14862
1983	988	225	2.5%	15475
1984	1744	363	2.7%	17506
1985	1798	420	2.7%	18798
1986	586	241	2.8%	18801
1987	163	43	3.1%	18026
1988	1129	697	3.3%	18686
1989	640	209	4.3%	19565
1990	750	236	5.0%	18374
1991	11	0	15.0%	15665
1992	n.a.	n.a.	7.2%	14514

Source: IBM-UK Annual Reviews. Figures include R&D.

## **WORK ORGANISATION AT HURSLEY**

The typical project cycle lasts two years. Most of the work involves teams developing the underlying structure that will support new sets of applications. Applications for a customer-specific requirement require a few weeks or months. Teams also support, service and improve existing products.

Teams have 15 to 20 people reporting to a first line manager. Each team may be subdivided into smaller groups with one to five persons depending on the work stages. Teams may be producers or planners (market and product) reporting to different managers and integrated at higher levels. Sometimes the team leader acts as both technical leader and project manager, and sometimes only as the former with the latter assumed by a team coordinator or the first line manager, according to the preferences of the team leader.

Second line managers have 4 to 6 managers reporting to them. With the 1991-92 downsizing from 300 to 170 managers, a larger span of control has been achieved. It is fairly common for managers to have more senior (technical) people reporting to them.

Team duration can reach two years, varies considerably and depends on the manager, the stream of work projects and their development stage, and individual career aspirations. Managers thought that sometimes teams were maintained too long while at other times were disbanded too soon.

"There is a hidden problem in that the (team) structure tends to persist even when the project needs to change. A manager might not release his people." Hursley Line Manager

TABLE 4.2. HURSLEY LAB WORKFORCE STATISTICS 1981-1991

Year	Total Recruitment	Graduate Recruitment*	Workforce Turnover Year-End	Workforce Year-End	Programmers as % of Workforce
1981	62	34	3.6%	1399	23%
1982	33	18	5.1%	1459	24%
1983	31	19	5.3%	1491	25%
1984	97	67	7.0%	1582	27%
1985	99	76	6.6%	1688	30%
1986	51	35	6.6%	1750	32%
1987	54	36	9.9%	1764	37%
1988	161	127	5.6%	1905	40%
1989	121	83	5.4%	1926	42%
1990	72	63	5.6%	1990	42%
1991	2	2	10.4%	1536	52%

Source: Hursley Lab Internal Statistics.

\* Includes experienced and new graduates.



The CICS Area employs some 500 people organised in teams within larger teams. There exists a fixed release cycle of 18 to 24 months with incremental changes introduced. In response to the planning area, development groups evaluate whether they can deliver a piece of the work. In practice the work tends to get divided out according to long-standing areas of responsibility. Both continuity and specialisation are achieved, but skill development concerns arise. Movement of people normally is driven by individual career concerns. Movement across development teams reporting to the same second line manager takes place easily.

## HURSLEY CULTURE

Technical Culture. Traditionally the Lab emphasised technical expertise as the most important quality for promotion into the management stream. By the mid 1980s, broader professionals and managers were sought. Consequently, a blurring of the divide took place. Older researchers have resisted this broader role. They have plateaued in their career, continue to give adequate performance but no more. Performance appraisals do not address this problem.

"You remember that someday these same people may be your manager. This leads to cautiousness." Scientific Centre Professional

Hardware and software people mix regularly and share the basic IBM and Lab culture. They do differ in work horizons (long versus short) and product orientation (ideas versus products), and the engineers were described as "nitty gritty" compared to the "airy fairy" programmers.

Local Cultures. CICS is very lucrative for IBM, has locked-in customers and aims for yearly releases. Lower managers are not responsible for project budgets, and

risk-taking is discouraged and considered potentially costly. This comfortable and secure environment has discouraged productivity concerns.

"People are not used to working to their full potential...the environment is too comfortable." Coordinator in CICS Area

"I do not have the entrepreneurial need to go and look for a piece of work for my teams." CICS 2nd Line Manager

Organisational Climate. The village-like environment is very friendly and tight knit. In the past most people made their careers at Hursley. They expect high professionalism, and challenge regularly. The "not invented here" syndrome prevails. The atmosphere tends to be informal, and contrary to IBM-UK practice, people finish at 3 pm on Friday afternoon.

"There is still a lot of reluctance to actually mix with other IBM people. It is a cultural thing." Hursley Personnel Officer

Power & Champions. Throughout IBM the line manager was viewed as the key individual with responsibility for performance and budget signing authority. This has begun to change with the introduction of team working. The responsibility becomes that of the entire team with the team leader facilitating consensus decision-making.

Managers also act as champions within the complex matrix organisation. The structure and the introverted culture imposed slow decision-making which could only be modified and accelerated by forceful management interventions. The continued push towards decentralisation and business units started in mid 1980s attempted to introduce entrepreneurial roles.

## **RESTRUCTURING FOR SKILLS ADVANTAGES**

Hursley management saw the 1990-91 reorganisation of the Lab as a challenge to make better use of the skillbase and improve research productivity. The Skills Development area was created with the expressed purpose of satisfying strategic rather than tactical skill requirements and individual career needs. The new area soon fostered broader technical roles for team leaders and innovative team structures.

Within a lab culture emphasising technical leadership, senior researchers tended to view management as a demeaning task. Responsibilities over resources were also clearly divided.

"If things were going wrong they (team leaders) did not actually take remedial action themselves." CICS 2nd Line Manager

"A low line manager has financial signoff whereas a high tech person does not. That has not changed." Scientific Centre Professional

Planning the new structure led to a new conception of team leadership with work ownership and people accountability. Team leaders became responsible, with the first line manager, for obtaining the right resources to build the team. However, with no HRM adjustments, professionals continued to view management positions as the real power base.

The new Lab environment needed both broader researchers and more specialised researchers, but differences of opinion existed and no coherent system was yet in place.

"If you are going to be a world class individual in a subject, you will not get it through being broad-based, hopping from job to job. We



need both sorts, but we seem unable to convince the people involved that we need both." Skill Development Head

Restructuring was guided by the work of a task force on team working. Collecting information on practices in other labs, their assessment of the Lab was circulated internally as papers and conferences<sup>1</sup>. With half of the middle managers removed and a wider span of control due to delevelling, the surviving managers were open to productivity experiments.

Green Blue & Red Managers. Based on a U.S. and Canadian experiment, Hursley introduced a pilot project involving 150 employees and using a structure of green, blue and red managers surrounding semi-autonomous teams. The green manager concentrates on getting pieces of work done, the blue on skills, and the red on project management with budget and business responsibilities and broad skill issues. The green or "team" manager plays the traditional technical task role. The blue manager is concerned with growing the skills of people within a career team, recruiting and building skills, and process improvement (skills supply required for future processes). This manager also does the appraisals. Green and blue managers meet to solve across-team problems.

In the old hierarchical structure, the first line manager had both task and people responsibilities. Second line managers had significant task and people responsibilities but low involvement in laboratory-wide concerns. Pushing task responsibility down to the team level, flattening the organisation, and giving the Lab a single coherent (software) mission combined to redefine the responsibilities

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<sup>1</sup>For more information, refer to IBM-UK internal papers written by E.W. Bryan, "Creating Effective Work Teams" and "The Role of the Manager".

of second line managers. They now spent more of their time on laboratory-wide concerns (2 days per week).

"There is far more cross-lab involvement and decisions being made...In my case it is things associated with the software development process, movement of people within the Lab, the management of the overall skills problem." 2nd Line Hursley Manager

The process was primarily learning-by-doing. The role of the blue manager in career development remains uncertain in the initial year of implementation. The green and line manager continue to play the dominant role for agreeing development goals with the individual and assigning tasks. Generic skill questions are being addressed by the blue manager, but from a small experience base.

"I do not have any experience in thinking about what skills I am going to need in two year's time, so I do not know what will be involved." Hursley Blue Manager

Acceptance by professionals of this skill experiment has been mixed. Team working did address a long standing criticism that technical decisions were referred to upper line managers with less technical expertise. Group versus individual rewards were considered more appropriate but unavailable. Managers experienced some discomfort on the manager's leadership role.

"I think team work is fine while it succeeds....The role of manager is changing but to me "manager" is synonymous with leadership." Hursley Personnel Officer

The new management positions (blue and green) call for different skill sets and career paths than in the past. Also, with a number of variations of skill working co-existing across the Lab, it may become difficult to transfer people.

"We do not know quite how to train these people (green managers)...We do formal education but there is some practical learning in there as well." Hursley 2nd Line Manager

"What happens when people move from one area to another because we are now creating three different environments." Hursley Transformation Team Member

Focus & Core Groups in CICS. A local task force found that senior professionals with high knowledge and skills were interrupted regularly to answer questions and assist others in problem-solving. This led to ineffective teams and low productivity.

"Some groups had variable sized teams, some did not have a team at all, they just put their resources where they were needed. This caused pretty low activity rates in work as you can imagine." CICS 2nd Line Manager

Consequently in 1992 development groups were reorganised into a core group responsible for the development work and a focus group acting as the interface with customers and other groups and documenting process work. First line managers were expected to minimise their technical role and emphasise their personnel responsibilities.

Within the core group, the team leaders became responsible for people some of whom come from outside groups, and for technical decisions at their level. This devolving of responsibility may have some repercussions on the appraisal process, the responsibility of the line manager.

The established practice remains of splitting the role of technical leadership and project management/coordination to suit the preferences of the team leader. Only now the decision belongs to the team leader rather than the first line manager.



Also, senior professionals wanted to keep in touch with customers and have task variety. At this point, the focus group is viewed as low status and undesirable for career purposes.

"I think there are variations, and there is not one rule that says you have to have your most senior technical person as team leader." CICS First Line Manager

"People view it as role that is not as highly valued as the other (core) one...I do not think that we have truly worked out yet how core team leadership compares to other work." CICS First Line Manager

Second line management responsibilities have been modified, but not specifically for the core/focus experiment. The managers have adopted a stronger focus on people management.

"I guess it is demographics rather than individual management of personnel issues....I worry about technical maturity and the ability to do our job...I manage career development with inventory lists." CICS 2nd Line Management

## **CONCLUSION: BUSINESS STRATEGY & SKILLS SUPPLY AT HURSLEY**

In the 1980s the skill profile of the Lab responded to four processes: (1) the pursuit and allocation of missions, (2) the business strategy of IBM-UK, (3) the work requirements at the team level, and finally, (4) headcount and redeployment practices. Because senior management was successful in obtaining a mix of hardware and software missions, it operated the Lab as a contracting business with short-term horizons and adopted a structure compartmentalised by mission.

The Lab did respond to the changing requirements of IBM-UK. M&S needed closer working relationships with R&D people to offer new computing services and to deal with more demanding and sophisticated customers. This trend accelerated in the mid 1980s and became more pronounced in the 1990s.

Manufacturing needed support for automation and process management, and for the faster engineering of product development results. In 1989 it became clear that corporate headquarters wanted to accelerate the market penetration of computing services and networking. Hursley Lab would adopt a 100% software mission and manufacturing support was transferred to the plants.

The introduction of a dedicated software mission of the Lab coincided with the downsizing. With smaller numbers and competitive requirements, the Lab was expected to become more productive. A flurry of change followed with both structure and management systems modified, and a variety of skill experiments introduced. With the creation of the Skills Development area, the Lab began to adopt a skills strategy which impacted on most HRM practices.

Though the missions of the Lab determined the overall skill requirements, in practice skills management took place bottom-up at first and second line management levels. The focus was their existing people and their development needs, and matching these with work opportunities which flowed from the missions. Table 4.2 suggests that this incremental process led to the gradual strengthening in numbers of the software skills within the Lab.

These four processes operated somewhat independently. By the late 1980s, forces in favour of a skills strategy were increasing. The 1990s would see a very different situation with the rapid emergence of a skills-oriented Lab. Before

discussing in detail the Lab's "skills supply strategy", it would be helpful to review the skill supply practices of IBM-UK and Hursley within the larger context of HRM structures and practices.

## **SKILLS SUPPLY & THE INTERNAL LABOUR MARKET**

### **CURRENT SKILL NEEDS & SUPPLY**

The demand and supply of skills within Hursley Lab has been shaped by the changing work requirements and, more recently, by changes in the work organisation. This pattern has altered requirements for both professional and managerial skills. The skill groups have become blurred as the concept of the broader professional and balanced manager has taken hold. At the same time, devolution and various "skill" experiments have created greater differentiation of roles and vertical recombination of skills. The skills inventory below was constructed from the interview material and reflects the skill concepts of the participants.

Professional Skills. The 100% software mission has increased the importance of **systems engineering, software development, network transactions, and advanced communications.** These skills support the activities of the Communication Systems business. Software skills related to the CICS products remain important. With the exception of the CICS area, these skills are in low supply. Depth of expertise has become more important to increase productivity. **Technical leadership and coaching,** usually assumed by the team leader, continue to be key to research teams.



In the 1990s, the Lab workforce needed to be reshaped at the same time as it was being downsized. This required both retraining and reorganising the support facilities.

"Obtaining the 100% software mission was partly based on reputation and partly on skill mix and that you have a few of the key core skills to go and develop the mission." Hursley Management Programmes Manager

In the 1970s, hardware people were rapidly moving towards screen-based work as opposed to manipulating objects. The transformation continued in the 1980s with people retraining gradually. Whether their level of software skills are adequate for the new mission remain a concern.

"We are beginning to have within the Lab a miss-match of skills. We have a lot of traditional skills." Hursley Management Programmes Manager

"You have some younger members of the workforce who have been through a computer science education... Other mature people have learned to programme by hands-on learning. We would like to up their base level." 2nd Level Hursley Manager

Senior professionals have come to occupy broad jobs in the professional ladder which evolved since the mid 1980s. They are expected to **understand the business environment, the customer environment, and the pressures on people**, in addition to possessing technical mastery of the software product. In many areas, they are also expected to do project management and require strong **interpersonal and influence skills**.

The increasing use of interdisciplinary project teams to bring a product to market and to offer consultancy services has obliged Hursley people to have contact with marketing people and customers at all stages of the project. Thus **interpersonal**

**and presentation skills, broad consultancy skills, and team playing** have grown in importance.

"In 1989, managers asked more skill questions: What is needed? What have we got to offer which goes beyond support for sales?"  
M&S Personnel Manager

"We could be pulling on a much wider range of skills...to provide a total solution to the customer and to work more in a partnership."  
Manpower Planning Manager at Corporate Personnel.

With the increasing emphasis on team selling and short-term development project teams, **personal skills and transferable skills** have become more important. Graduate recruitment criteria now highlight these skills as well as the normal technical skills sought.

"The total person was always important at IBM, both technical and personal, but now it's more critical." Recruitment Manager at Corporate Personnel.

The new skillbase and team organisation at Hursley requires **team building and working skills and an attitude of empowerment**. However, team leaders seem to lack the **skill to differentiate types of decision situations**. Training has tried to address these requirements.

"By now they realise that they do not need to agonise over all decisions. I think the team leaders just have to grasp the problem."  
Hursley 2nd Line Manager

To enhance IBM's scientific profile, researchers need to have the corresponding **interpersonal skills** to complement their technical skills. This rounded professional would be able to **initiate and develop external involvement** and act as a bridge between the Lab and the outside.

Managerial Skills. The main technical managerial skills include **project scoping, project management and control of resources.** In the early 1980s and beyond, IBM ensured, through training, that its managers had a **balance of task and people skills.** These skills were considered very relevant for the R&D environment where technical bias prevails. Recently **change management skills** have become important for all managers.

"It is important that we have managers that adapt to change and are happy in a changing environment and feel not threatened."  
Hursley Management Programmes Manager

Team working and the software mission have increased the importance of **skills management and coaching.** Team working has also changed the managerial emphasis away from direction and control and towards **leadership: interpersonal skills, external awareness, ability to champion change, strategic planning skills, and ability to balance the needs of the individual, team, and business.** The availability of these skills remains uncertain.

The above inventory of skill needs and supply are addressed by two overlapping but independent processes: the core HRM policies and practices of IBM, and concerted skill supply practices. Both processes impact on the skillbase as mediated by the internal labour market (ILM) which is described below.

## **INTERNAL LABOUR MARKET**

IBM operates a well defined internal labour market with limited recruitment, promotion from within, and lifetime employment. On average, turnover rates of 3-6% were experienced in IBM-UK and Hursley in the 1980s.



Recruitment & Turnover. Recruitment in the 1980s was strong throughout IBM-UK in the first half, and thereafter irregular (see Table 4.1). Fresh graduates accounted for a growing percentage of recruits. Turnover remained at 3-4% and increased as of 1989 in response to release schemes. In 1991, almost no recruitment took place, and turnover climbed to 15% with restructuring and downsizing. That year, Hursley released its share of managers and professionals.

At Hursley turnover rates remained at 5-6% with people in their early 30s as the most prominent leak (see Table 4.2). The Lab has lost a few first line managers who were specifically targeted by poachers or lured by the lifestyle of the American west coast. These few losses were regretted, as well as the occasional loss of people from the executive resources programme dissatisfied with their progress. Some professionals were lost because of their misfit with team working or their desire for a "socially worthwhile" job.

Promotion from Within forms part of the tradition of commitment to "full employment". An extensive posting system exists within the UK and world-wide. Depending on the expected availability of candidates with skills, management chooses to post within the division only, UK wide, or world-wide. A regular two-way flow exists between Hursley and the U.S. labs as part of executive development. Within Hursley, promotion from within acts as an important motivator.

"We tell employees on day one that the opportunity to progress depends upon your own skills and talents and the way you apply yourself. Not only do we not recruit but we are actually pretty proud that we do not recruit." Lab Management Programmes Manager

Some divisions have at times refused to post jobs for fear of losing critical skills. When prompted by senior line managers, Personnel would intervene to help find a solution.

"The personnel manager would be empowered to arrange a compromise. Marketing wanted to recruit from Hursley which did not want to lose these people. The Lab eventually agreed to do the programming." Senior Personnel Consultant

Use of Contractors. For decades IBM has used sub-contractors in core and non-core areas. In the 1970s individuals and teams of programmers increasingly were brought on-site at Hursley, and some pieces of work began to be given off-site.

Within Hursley no concerted policy was set. Management used contractors as a buffer for the peaks and troughs in work demands. Contractors received up to triple the salary of its regular researchers, and their long-term use has led to morale problems. Concerns have also risen about training people from the outside on new products instead of IBM people.

"We ought to have our own people working on new products for motivational reasons and certainly for building core skills. We tended to put contractors in where we needed them on an expediency basis." CICS 2nd Line Manager

Use of Part Timers. In Hursley part-timers were extensively used in support areas, and the full-time complement of positions was reserved for researchers. While part-timers benefited from the full employment policy, they were not on the headcount.

Both sub-contractors and part-timers have become steady sources of recruitment for full-time positions in manufacturing and the Lab. This practice has worried

Personnel which argues in favour of open competition to find the best possible candidate.

Mobility. Under normal circumstances, movement took place because of career development, personal reasons or a desire to change job. IBM offered financial and general assistance. Geography and multiple sites play a role, favouring M&S and disadvantaging Manufacturing and Development. Personnel and line managers have complained about the unwillingness of some people to relocate for strictly business requirements. Typically line managers handle mobility issues unless the transfer of large numbers of persons is involved.

## **HUMAN RESOURCE MANAGEMENT AS CONTEXT**

### **TRADITIONAL HRM UNDER PRESSURE**

IBM Corporation has a long tradition of valuing its employees, dating back to the 1950s and 1960s, through core policies of full employment, single status, employee flexibility, and employee influence. These policies are underpinned by the belief in respect for the dignity of the individual and appropriate rewards (individual merit pay).

Staying abreast of technical change while maintaining full employment are pursued through workforce planning and internal promotion, generous use of education and retraining programmes, willingness to pay people for the expenses and problems of moving, and a willingness on the part of employees to accept the need for skill changes.

This commercial version of lifetime employment was supported by the corporate personnel function which viewed itself as the guardian of HRM. While changes



were made to adapt to a changing internal and external environment, only organisation-wide incremental adjustments were supported. Hursley Lab was able to organise the work as desired, but corporate people policies and practices were respected. By 1990, the world-wide IBM organisation was undergoing major change as incremental adjustments had failed to improve revenues and profits. The personnel function was slimmed and personnel systems were modernised to support line managers. Hursley would emerge as somewhat smaller, focused on software, and with a new function called Skills Development.

## **PERSONNEL FUNCTION & STYLE**

While the line manager was primarily responsible for managing people, Personnel saw itself as defender of the core people policies. Within the Hursley Lab, personnel was divided into three areas: (1) personnel operations for routine administration, (2) personnel systems and support where four personnel officers supported senior managers and offered consultancy, and (3) management programmes (see Figure 4.2). IBM-UK gradually imposed standard policies and procedures on Hursley over the decades by filling the position of Lab Personnel Chief, introducing a common patrol system (early 1980s), and centralising files in IBM-UK (1992). The Lab Personnel Chief has a difficult balancing act:

"First, I had to satisfy the Lab Director. Second, we were part of a network of U.S. labs. I went there six times a year to compare U.S. and U.K. personnel policies and practices....Third, personnel policies and practices had to be in line with IBM-UK which would get upset otherwise." (Previous Lab Personnel Chief)

Personnel people included personnel specialists and line managers with a track record. The latter typically remained for a few years to champion a current "issue" on a project basis and broaden their experience. The Lab benefited from

many on-site services which gave line managers a high level of administrative assistance.

"The philosophy in development was, we are here to manage the task of developing products and we have not got time for personnel type activity." Hursley Management Programmes Manager

The reorganisation of 1991-92 transferred personnel responsibilities to line managers, but with less discretion. Filling key vacancies was controlled by new coordinating bodies.

## **PERSONNEL SYSTEMS**

Until recently, IBM-UK and Hursley Personnel were supported by a 1970s personnel system which was paper and people intensive, and operated on a mainframe system. It generated individual employee profiles and aggregate reports.

Anticipating the key role of line managers, planning for an on-line distributed system with user-friendly icons began in 1990. Line managers will call up an individual's file by name and insert decisions on screen (eg., performance appraisals and rewards) which evoke action elsewhere in the organisation. The system also would situate the individual in the job and the organisation, contained detailed skill information, capture vacancies and people availability, and serve the individual for career development and training. At this point, little discussion has taken place on strategic skills and on helping managers think about it.

"We are now moving into the area of what skills does the business need to operate. This is a far bigger question." Personnel Systems Planner.

Parallel to the development of the above system were independent efforts by both Hursley Lab (started in 1991) and M&S. Their experience would help guide the skill components of the HRM system.

## **RECRUITMENT PRACTICES**

Stable recruitment practices were in effect with changes in the numbers of fresh and experienced graduates recruited. Corporate Personnel handled the front-end and the Lab the back-end (offer of employment). Graduate recruitment includes the national milkrun followed by a second interview in the operations area and a group influence exercise. Typically line managers become involved at all stages. Graduates are judged in a holistic manner. Recently, more emphasis is being placed on personal skills and transferable skills.

The 1991 milkrun was cancelled because of the recession and absence of business growth. In 1992 graduate recruitment was expected to number 40-50, well below the average level of 250 in the 1980s. Only fixed-term contracts of 4 years duration would be offered.

Within IBM-UK generally, more experienced graduates were hired in 1990 than fresh graduates (249 vs 236). Within Hursley, the reverse was true as of 1986, reflecting the difficulties of recruiting expensive software professionals. In the past skill considerations in recruitment were generally very crude.

"When I worked in CICS programming...we wanted to get a balance between graduates and non-graduates, so we recruited 25 graduates and 25 experienced people. And that is as scientific as we do our skills planning." HRM Systems Planner



Internal IBM movement flows through the job posting system, but managers also make use of their personal networks and word-of-mouth. Though formally discouraged, the informal route is exploited by first and second line managers within the Lab when confronted with skill shortages.

## **TRAINING PRACTICES & PROGRAMMES**

Within IBM-UK, the training and education programme was part of corporate Personnel. Operating primarily out of Newplace, a wide variety of courses are offered: technical, personal development, and managerial development. On average each employee receives 10 days per year of training and education. The programmes address both regular personal development needs, work-related requirements, and reskilling for redeployment. In addition they act as the main lever of corporate-wide programmes such as the technical vitality programme and the managerial rebalancing programme (people and task considerations) of the early 1980s. Rebalancing was viewed as very successful and appropriate for Hursley.

Hursley made use of IBM-UK's training organisation for general management training, but maintained a separate education programme and facilities. The Programme services the needs of team leaders and senior technical people, sometimes in collaboration with other IBM labs. While the line manager helps to identify the individual's skill and development needs and corresponding courses as part of the yearly career planning exercise, it remains the responsibility of the individual to enrol in them. Hursley Education advertises a list of courses for the next three to six months.

Within an area, structured education in the processes, tools and products are offered for new arrivals and redeployment. Thereafter formal training and on-the-job training are intertwined.

"There is a road map laid out which gives you the sort of courses that we expect people to go through." CICS First Line Manager

Graduate Training. In 1988-89, graduate training was reorganised away from the intensive formal classroom environment in response to graduates eager to have a "real job". The GEM programme provides for both rapid job placement and training in modules tied to the job over 18 to 24 months. The initial 3 week induction moves people around to acquaint them with the different areas. Mutual expectations are built into the system.

"This training commitment is written into their employment contract to make sure that pressures of work and management do not actually forget about it or force it out so that we cannot do it." Hursley Personnel Officer

Controlling Costs. In 1989, corporate personnel introduced the policy requiring executive sponsorship for any new training and education development work. Now each course has an executive sponsor who is responsible for the yearly review and for modification requests.

"We are more focused than before. In the past, we would supply trainers without asking too many questions." Corporate Personnel Manager

With reorganisation and the slimming of corporate personnel (1991-92), Education and Training responsibilities were contracted to Skillbase Inc. It has taken over the long-term leased building and the curriculum of courses. The cost savings to IBM were significant, and training became more focused. However, the

smaller workforce in Skillbase has less flexibility in responding to short-notice requests. The new arrangement has meant little change for line managers who had already adjusted to the requirement for executive sponsorship of education initiatives.

## **REDEPLOYMENT & DOWNSIZING**

Within IBM, there was a general belief that the training and education function could reskill people for new areas. By the mid 1980s IBM-UK began to redeploy growing numbers of support people into revenue-generating positions. The percentage of customer-facing employees jumped from 45% in 1986 to 60% in 1990. This redeployment was accompanied by gradual workforce reduction. The financial crisis of 1991 pushed management to accelerate the restructuring and the accompanying downsizing.

"...moving more employees into the field, streamlining our organisation, shortening reporting lines and devolving decision making. The process will continue." 1989 IBM-UK Annual Review p5.

Hursley experienced gradual redeployment with changes in skill requirements. Displaced employees generally went to other areas in the Lab, but some were transferred into the growth area of M&S in systems support. The Lab also underwent downsizing in the 1991-92 restructuring, and saw its hardware missions transferred wholly to the manufacturing plants.

## **VOLUNTARY RETIREMENTS & REDUNDANCIES**

Corporate Personnel had the task of creating release programmes to meet downsizing targets. Initiated in 1987, early retirement packages were



successively offered and came to cover younger age groups. Workforce turnover percentages are presented below.

<b>Year</b>	<b>Early Retirement &amp; Releases</b>	<b>Total Turnover</b>
1987	2.4	3.1
1988	n.a.	3.3
1889	1.2	4.3
1990	3.1	5.0
1991	12.7	15.0
1992	5.4	7.2

Source: IBM-UK Annual Reviews

Between 1987 and 1989, persons targeted had long service or were 58 years of age or more. Each business area helped to identify candidates. The offer was not publicised and individuals were not pressured.

In 1990 a major programme was launched with incentives for job categories and age groups. A different package was needed for persons 56-58 years of age who tended to desire two more years of employment. Skillbase was set up for that purpose. The following year witnessed major downsizing which impacted on Hursley Lab. Voluntary redundancy took place for the first time under the Careers Transition Programme.

Certain groups of employees were targeted based on skill and age considerations with the 40-50 age bulge as the principle challenge (Peach, 1992). Preserving scarce skills important for business and forecasting take-up rates were important considerations. The process began with a study of desired versus existing

headcounts and ratios and gradually worked its way to departments where local managers were involved.

The main target were senior professionals and managers on the support side earning more than £31,000. Improved pension was accompanied by paid leave of absence to find other jobs, outplacement services including Skillbase, and an opportunity to purchase their company car. Spin-offs also took place: property services, the transfer of professional and management development training to Skillbase, and the creation of Lexmark to sell IBM equipment and printers.

Exclusion (and consequently retention) took place at three levels: whole departments were excluded (eg., those offering consulting services); managers could select individuals and dissuade them from volunteering on the basis of their skills or high potential; and when the total number of applications in a department threatened its capability to continue business, some offers were withheld. However, the demanding downsizing targets of 1991 meant that managers had difficulty in protecting valued skills.

"Information on skills were accessed through job titles, business area, and knowledge of the local manager." Senior Personnel Consultant

Over 2,000 employees accepted the offer. Surprisingly, 265 employees under the age of 40 volunteered and were accepted; among them were younger women who saw an opportunity to fulfil family goals and responsibilities.

## **CAREER MANAGEMENT**

In the mid 1970s IBM introduced career management systems and officers to address the needs of its aging employees and reassure them of career

opportunities despite the slow business growth. The 1980s witnessed a push towards self-directed career management in IBM-UK. Dissatisfaction with job postings led to employee's wanting to do more of their own career management. According to the attitude surveys, employees generally saw the job posting system as unfair with the job going to a pre-destined candidate. Hursley Lab responded to this perception in the early 1980s by a formal policy to post all vacancies and giving all interested persons the opportunity to apply. This remedy failed. Sometimes a department of five persons would be reorganised when one person left, giving rise to four enriched positions and no replacement. Even if there was a replacement, the posted job would group tasks considered undesirable by those already in the unit.

In the late 1980s, the Lab Director responded to continued employee dissatisfaction. A new career management system was put on-line in 1989-90, jointly managed by the employees and immediate managers, and part of the informal appraisal counselling system. It allowed individuals to list their skills, include a free text curriculum vitae, and learn about the skill requirements of other jobs. As it happened, with the reorganisation of 1991 the new system assisted redeployment through key word searching, and was little used in career planning.

Career Paths. The dual career path of management and professional was established decades ago with professionals able to attain a high job level and a salary of £50,000 plus. However few such positions exist in comparison to management positions.

"In the early years, people drifted in and out of management. There was a lack of technical leadership as people sought more rewards and recognition by going into management." Hursley Personnel Officer



At Hursley, the professional path was modified in the mid 1980s. Senior positions became broader and included business and customer understanding and an appreciation of people dynamics. This modification was part of the medium-term plan to downsize IBM and its labs, and delevel management ranks.

## **MANAGEMENT DEVELOPMENT AT HURSLEY**

Management Programmes (M.P.) Manager has two inter-related responsibilities: the appointment of new managers and job changes for existing managers; and executive resourcing for rapid development. This long established area aims to enhance the skills of the entire management team in counter-balance to local preoccupations. With the reorganisation, a more pro-active approach has been adopted.

Executive Resourcing has three established programmes: (1) Early Eye for fresh graduates involving identifying their potential in the first four years of their employment and specifying their special needs to achieve this potential; (2) High Management Potential for people usually in their thirties who are thought to be executive material for the Lab and elsewhere; and (3) High Technical Potential for those capable of becoming the best in their field.

The M.P. Manager follows up a line request for filling a position by matching the specific work requirements to his lists and current information, and proposing 1-3 candidates. The line manager does the final selection for junior management positions. For senior positions, the Lab Director assumes responsibility.

The downsizing of the late 1980s and early 1990s saw the management group drop from 300 to 180; managerial layers were removed and non-managerial positions given broader responsibilities. Management development activities were broadened to include senior professionals and team leaders, for a total of 400. This trend was reinforced in 1991 by the Lab Director's decision to include a larger audience at the bi-monthly plenary management meeting.

"Some of the team leaders and technical heavy-weights were made part of the greater team. They are not actually management but they are starting to become more like managers." Hursley Management Programmes Manager

## **RESPONDING TO THE 1990S - SKILLBASE INC.**

IBM-UK had some regrets in losing the skills of retirees. At the same time, IBM-UK was planning to expand its consultancy services, particularly the high end of the consultancy business. Based on IBM experience elsewhere, Skillbase was established in 1990 as a joint venture between IBM-UK and nine of its senior people taking retirement. It offered a wide range of consultancy services (strategic and business planning, corporate communications, operational efficiency, education & training) at competitive rates thanks to its low overhead costs. The initial "programme" included 350 IBM retirees placed on a registry.

Following other release programmes, the registry quickly grew to 1200 IBM people less and less old. IBM-UK quickly saw that Skillbase could also take over its Education & Training function, a non-core activity. The company trusted its ex-IBM people to deliver an appropriate and reliable service at a savings of 30%.

"It had created a unique pool of people that it knows and can trust....it could not possibly put it into the market place and lose control." Skillbase Manager

Skillbase has also acted as marketing channel for a few products with short life expectancies, thus giving IBM-UK additional flexibility. In February 1992 Skillbase accepted the responsibility for 3000 BT retirees. Also, it expected to pick up 30 to 60 IBM-UK retirees per year. No skill gaps were experienced or expected in the future.

The consultants have proven to be excellent in their work, and have demonstrated more flexibility in work assignments involving major displacements. So far, Skillbase has had no impact on Hursley.

"The general reaction is that they are absolutely fantastic...He likes it and cannot believe how lovely it is to do one job at a time."  
Skillbase Manager

## **CONCLUSION: HRM & SKILL SUPPLY PATTERNS**

The above review of HRM practices and programmes demonstrates the volume of resources which were dedicated to the management of the ILM. One clear theme to emerge is that of historical continuity around the corporate policy of lifetime employment with small incremental changes introduced in recruitment, training and development, and exiting to modify the ILM for business requirements. While corporate programmes were rolled out periodically to address a skill issue, the management of the Lab's skillbase appeared to be a bottom-up and incremental process within the framework of corporate policies.

A second theme presents itself by the amplitude of change in the 1990s. The traditional management of the ILM was becoming difficult; new levers and



approaches were introduced to resize and reshape the internal workforce. The diminishing role of the personnel function and the growing role of the line manager in personnel administration were counter-balanced by the growing role of the middle manager in managing the downsizing, redeployment and reskilling. This new arrangement of responsibilities in HRM brought more emphasis on organisation-wide business requirements. This theme suggests that the HRM context within Hursley had become more favourable for the emergence of a skills supply strategy. To be fair to the personnel function, workforce planning and skill audits were not new activities. A review of these activities is presented below to assess their skills preoccupation, followed by the more recent and promising developments called Hursley Skills Development.

## **INTENTIONAL SKILL SUPPLY PATTERNS**

### **WORKFORCE PLANNING**

Manpower planning within IBM-UK is integrated into the 5 year strategic business plan; components include workforce, revenue, expense, and compensation. The expected level of revenue would dictate the workforce levels. A one and two year operating plan ensures its implementation and control. The main tool of manpower planning is the personnel data system which includes patrol.

Targets for recruitment, redeployment and exiting are adjusted to achieve desired staff ratios (support/non-support). With the business shift towards software and services, manpower planning has focused on rebalancing the

workforce. Desired ratios have changed. In 1985 45% were working directly with customers; by the end of 1992 the figure was to reach 70%.

A variety of assumptions are made to generate the manpower plans, such as the U.K. economy and employment prospects, and historic wastage rates by geographic and business area. Manpower planning also recognises contract types: permanent, expensive core people; people with contracts from 6 months to 4 years; and contracted services (e.g., security). This peripheral workforce gradually has grown in importance.

Manpower planning views skills as a product of the organisational structure with skill groups limited to macro labels such as managers and professionals of a given level in a certain business area. Skill acquisition and development are seen as remote concerns.

"At the individual level, you may be saying, do I have the right individual for a key job in the future. Am I retaining the right quality in a selective way? That perspective is not one that I need to concern myself about." Manpower Planning Manager

A tenuous link existed between IBM-UK manpower planning and Hursley. The workforce planning of Hursley was centrally done in Armonk in response to mission and budget allocations. IBM-UK overlaid to ensure a balance across divisions for career movement, and to balance the presence of M&S with Manufacturing and Development. As corporate citizen, IBM responded to government concerns about equity of investment across countries and balance of payments.

Because the Lab had a variety of software and hardware missions, workforce planning became a bottom-up exercise from the product areas coordinated by the

strategy planning group. The recent emergence of the software mission and the creation of Skills Development has introduced a middle-down and lab-wide approach to skills planning.

## **SKILLS PLANNING**

Skill audits within IBM-UK were used repeatedly to address redeployment requirements. Entry skills and subsequent work experience were reviewed for the changing work requirements. Each audit was driven by a single purpose and situation, and was short-lived.

"...a line manager was put into personnel to push the initiative. The initiative usually died soon after this person moved on to another job. Typically the skills data base remains useful for no more than three years." Senior Personnel Consultant

IBM-UK also would learn of skill planning systems developed and used in other parts of corporate IBM, but management would choose not to adopt them because of adjustment and maintenance costs.

In the early 1980s the Havant plant created a skills planning system to profile its workforce. The plant needed to demonstrate the availability of the right skills for product bidding. Management developed its own data base with aggregates of number of people with types of experience. It was deemed very successful as a strategic planning tool and less so as an education planning tool.

The same system was installed at Hursley for education planning. A recent review called for important changes. Hursley managers needed a talent data base to find individual employees with skills desperately needed for a given project.



The Lab periodically tried to develop skill systems and skill inventories in the 1970s and 1980s. Employees could not be persuaded to wade through long lists of skills. Recently, the Lab introduced a system where individuals voluntarily insert on-line their job history. The data base can be searched with key words (eg. APL coupled with large mainframes). Currently (1992), 600 of the 1400 professionals have done so, mostly those seeking new jobs.

New Professions Programme (Skillplan 2). This world-wide programme was introduced in 1991 in IBM-UK (1992 in Hursley) to foster expert professionals through a skill certification process. Expert senior professional positions are included, covering 10% of the workforce. A tailored compensation plan exists with a new career ladder that builds upon that of the systems engineer.

An individual can profile on-line his skills or competencies against those attached to seven senior positions, interpersonal skills and higher level cognitive skills, and identify training requirements. There are also internal review bodies of professionals (not managers) who specify additional practitioner knowledge and certify their competencies. Line managers will only be able to fill these positions with certified people.

Currently the programme remains isolated and almost invisible. Few promotion opportunities, lack of management buy-in, and absence of a UK champion have slowed down its introduction. Indeed a fundamental change in perception of business requirements was at issue. Meanwhile, the Lab had launched its own skill-based programmes.

"The programme needs a UK champion. We also suffer from a "not invented here" syndrome." M&S Skills Manager

"Before, we wanted generalists, but now we want expert professionals." M&S Skills Manager

Impact of Mixed Missions and Single Coherent One. The internal structure and politics of the Lab mirrored the missions with each group owning and controlling its own resources. The new focus on software and the clear reporting line to Communications Systems prompted a reappraisal of skill planning practices (1991).

"With many masters it was very difficult to achieve stability and equally it was very easy to confuse them all...Now with a single owner...you can make all of the management decisions on allocation of skills within your own boundaries." CICS 2nd Line Manager

"The time has never been better to have a laboratory-wide look at the skills it needs." Hursley Personnel Officer

## **HURSLEY SKILLS DEVELOPMENT**

In late 1991, Skills Development was created, composed of the Skills Board and the Skills Process Council, and headed by Paul Gibson reporting directly to the Lab Director. It aimed to satisfy strategic rather than tactical skill requirements and individual career needs. Adjusting internal and external recruitment practices, reconceptualising the education programme, and creating new structures were the main levers.

"Typically we hire externally 30 to 40 people. Compare that with the 300 to 400 people that move internally every twelve months."  
Skills Development Head

Skills Board. In order to redeploy some 400 hardware people (1990), a staffing committee was created composed of second line managers. Relying on personnel information and placement opportunities, the committee relocated people into



software and support activities. Little choice was given to either the people relocated or the managers receiving them. During this period all career movement was frozen.

"We had to create some stability and generally speaking, the cooperation of all employees was very high....This (redeployment) has never happened before on such a scale." CICS 2nd Line Manager

Redeployment was helped by the presence of some transferable skills. On the other hand, the self-taught programming skills of many hardware people meant that some un-learning was needed as well. Other areas were obliged to pursue new software work related to mainframes but different from CICS. People with different backgrounds (hardware, and software for workstations) were brought together. Local expertise was built from scratch.

"There were no local experts on this software to say what sort of education was required. It was a question of people learning together." Hursley Blue Manager

In 1991 the staffing committee became the Skills Board with the addition of members of the business community, and received a new remit: identify the skill needs and supply across the Lab and manage shortages. In 1991-92, strengthening the core productive activities guided redeployment. The existing HRM systems such as the employee development plan and job posting were viewed as serving the needs of individuals and not the business. Because of the rigidity of rewards dictated by corporate policy, comfort factors and innovative work dominated their choices. Job preferences have led to manpower imbalances with some Lab areas running under headcount because they were unable to attract people from within. The Skills Board was given control of the Quarterly Control Figures, the headcount across areas and positions opening and



diminishing in them. A voluntary system with an open job market was maintained. In addition the individual would be provided with information outlining the business needs and the effects on career and the personal choices being made.

"We control the advertising of the skills within the Lab. So while we cannot make people go to particular places, we can manage the opportunity for people to move." Skill Development Head

Given that the recruitment process was one of the few levers that the Skills Board could influence, it used it extensively. Recently the Board instructed a department to advertise externally only in order to avoid internal transfers of scarce skills. The expectation remains that line managers retain ownership of the groups and encourage people to join their groups. However, people no longer require permission of their line managers to apply for another job. Discussions are underway to target specific universities and specific groups and "attracting the right sort of people to be interested in IBM".

Skills Process Council. This managing board is chaired by the Skills Development Head and composed of HRM related individuals from across the Lab. It deals with the management and growth of tactical skills, those related to immediate project needs. It also helps to define the "skill process" within a two to five year horizon and to sell the priorities across areas. The Council has a growing policy role in how skills move back and forth in the Lab (recruitment, release, complementary workforce, management development, assignment programmes). It also concerns itself with productivity.

"We need to educate and persuade the producers of the Lab to use this technique (code re-use). It needs to be done in an organisational way." Skills Development Head

## SHAPING THE SKILLBASE

In addition to recruitment controls, the Skills Board tried to redress the skills imbalance by attracting planners and managers back into their previous technical roles. The **Restart or Transition Programme** prompted a reevaluation of the use made of the management inventory. An annual review would take place with continued inclusion dependent on management performance. Exclusion would mean that the person would not qualify for management promotions and would not be taken back into the management stream if the person left for a career move.

"We are taking some management action to say, in future the rewards, promotions, career paths will be advantageous in direct areas compared to support areas including management." CICS  
2nd Line Manager

Skills Development set up an industry involvement initiative (Mentoring or Outward Looking Programme) where 30 senior technical people voluntarily agree to branch out into the broader community, attend meetings and "realise that there are more solutions outside this Lab than inside." These people act as mentors for an equal number of juniors. A point system was set up to rate performance and after six months, non performers would be replaced. The Vast Technical Development Course was created for participants. Course content included both interpersonal skills training and technical material. The Skills Development Head has included the criterion of outside involvement for senior promotions. Line management reactions have been mixed to the idea of including outside participation in the regular appraisal.

"A lot of managers did not want it. What will it do to my travel budget? Others, just the opposite: It is absolutely the right thing to do." Skills Development Head

Technical leadership became important within the focused mission. The reorganisation in the late 1991 and the activities of Skills Development led to the **extended technical path**, and some visible promotions. In order to ensure that productive technical people are not enticed into a planning (senior technical positions) or a management role, a third career path is being considered, that of **Producer**.

Initial work on skills development revealed that the courses offered by Hursley were employee driven and provided according to employee preferences. Rethinking education for skills management led to use of the term "**skill creation**".

"...we are getting away from thinking about delivering courses, teaching and running classes, and more into an interactive role with the (business) areas that need to grow their skills." Skills Development Head

"How many people do we need to have with transferable skills and be able to move them from A to B and so on? We are quite new at this game." Hursley Management Programmes Manager

With the new software mission, newly assembled teams have to achieve high performance as quickly as possible in a new area. This has proven to be difficult to achieve. A pilot project involved keeping teams together for longer periods of time, training them together and transferring them together to a new project.

With the lower headcount, managers have become more sensitive to the effects of previous **contracting practices**. The use of contract people was easily justified: their lower overhead translated into profit for the Lab. The needed skills were



obtained through contracting without concern for the longer term effects. Some software skills were not developed internally (eg., Unix), and there was more growth of contract and coordinating managers. The Restart Programme has helped to pull work back into the ILM, but skill levels are too low.

"We have lost the ability to do it ourselves in some cases.... We mended the workload based on expediency." Hursley Line Manager

"If you hire sub-contract staff on the site, then some of your IBM people end up being coordinated and run by the contractors and are moving further away from the front-line action." Skills Development Head

The Skills Board has given second line managers an organisational mechanism to influence the Lab's skillbase, and has helped to cement this new emphasis in their work. With all Lab areas represented by knowledgeable line managers, we can conclude that harmonisation of short-term and long-term skill requirements are more likely.

## **CONCLUSION: AN UNCERTAIN FUTURE**

Manpower planning was part of the HRM framework supporting lifetime employment, and paid limited attention to skills. In contrast, skills planning had elements of SKISS in that skills were defined in relation to a larger business consideration, but lacked coherence and consistency over time. Hursley Skills Development has shown more promise. Driven by the mission change and the concurrent downsizing and restructuring, the skills strategy was anchored in the Lab Director and led to numerous structural and programme changes supported by changes in HRM policies and practices. Unfortunately, as of May 1992, Paul

Gibson moved on to Software Development Operations. In the past, the departure of the champion doomed the planning system.

## **HARD & SOFT BENEFITS**

In this section, changes in hard and soft benefits are reviewed, as well as the intention to retain (and recruit) critical skills for business success. Were benefits combined and changed in a coherent manner for a skill-related purpose?

### **HARD BENEFITS**

Throughout IBM, standard hard benefits (base salary, benefits, incentives and pay policies) have been the norm for decades and were driven by equity and market considerations. In many cases, little change has taken place. Hursley Lab adheres to the IBM-UK policies and practices. Interviewees consistently minimized the importance of hard benefits as retention benefits. The total package was deemed competitive and attractive, but also treated as a given. The changes in 1991 and 1992 were considered worrisome, but did not alter their perceptions on hard benefits.

#### **(1) Base Salary**

Standard conditions are offered to all employees in the form of a personal contract. Each job level has a base salary range of 100-150% to reward exceptional performance. Base salary is set by the market mid-point for comparable work in selected competitors based on industry surveys. The relative value of each job is assessed through an IBM world-wide point system.

In 1990, salary increases (1-2% in taxable cash) or shares (non-taxable)) were linked to targeted increases in customer satisfaction as measured by an independent industry survey. There was no increase in satisfaction and hence no payout the following year. The scheme also became inoperable with the business downturn. In 1991 IBM-UK imposed the first ever pay freeze, effectively a decrease given the fact that IBM never offered cost-of-living adjustments.

## **(2) Benefits**

All employees receive the same pension, medical cover for sickness and accident, vacation entitlement, life assurance, and travel accident protection, with some service-related entitlements. IBM aims to be above average on the overall package of benefits.

Changes in Pension Benefits. In the early 1980s penalties for early retirement acted as a retention mechanism. Early retirement programmes were introduced in 1987 and thereafter. With repeated offers, more money was considered ineffective. Typically the offer included diminishing the 3% per year penalty for early retirement, and adding a lump-sum payment. In mid 1990 and guided by internal surveys, expensive employees were offered full pension, a lump-sum payment, and 90 days of consultancy through Skillbase for each of two years following retirement. The package was equivalent to their current salary. Equally important was the continued relationship with IBM-UK.

"They all had some degree of fatigue and agreed that they could live on their pension and the lump sum....They all felt they had a tremendous amount of knowledge and ability and experience to contribute." Skillbase Manager



Subsequent releases targeted younger employees with long service, but the 90 days of consultancy was not offered. For persons aged 48-49, pension adjustments were considered inappropriate as they likely would continue to work. However, their pension was made payable as of 50 years of age and the lump sum was improved. All could seek the services of Skillbase for some casual work.

Hursley was affected by the 1991 and 1992 releases. Some managers and professionals disappeared, but the impact was less dramatic than elsewhere in IBM-UK.

### **(3) Incentives**

Awards. Programmes of awards have been offered for decades including special contribution, exceptional achievement, outstanding technical achievement, outstanding innovation, a suggestion programme, and examination success awards. About 10% of employees received financial awards each year varying from £75 to thousands, many of which were accompanied by certificates and plateaus.

Change in the Employee Stock Purchase Plan. About 70% of employees participated in the plan. In 1991 it was replaced by a new plan where each employee would receive shares (or cash) equivalent to 1% of their salary if the independent industry measure of customer satisfaction rose by 2 points, and shares worth 2% of salary for 4 points. With no improvement, no shares were distributed.

#### **(4) Pay Policies**

IBM had stable pay policies, and only a few important changes took place in the 1990s: term contracts, and a shorter-term pay orientation. Internal consistency of salaries was high world-wide and standard within the UK, though pay secrecy was practiced. Pay for performance focused on performance objectives and was important: over time, the differential between a high and low performer can reach 40%. The principle of single status has led to standard conditions of employment and benefits, and pay discussions with the immediate manager can take place but rarely lead to salary adjustments. Skill considerations were reflected in the training-related goals in the annual performance review.

History of Contract Types. Fixed-term contracts with high market rates were offered to experienced professionals with scarce skills. In 1988, they were offered to graduate recruits, but on the regular salary scale, when competition for the best was fierce.

"We targeted a pool of good people who might not work for IBM for several reasons, one being a large technical company...We offer you good programmes to get experience and a bonus at the end of the four years." Corporate Recruitment Manager

Graduates perceived both term and permanent positions as real offers. This practice continued for targetted groups. With the business performance crisis of 1991, severe recruitment constraints on permanent headcounts were introduced. Term contracts escaped the official headcount, and managers were able to maintain some recruitment through non-salary budgets. In the same time period, these contracts were introduced in M&S for the recruitment of retirees with specific industry expertise. In this business area, flexibility was the determining

factor from the beginning, whereas with graduates it became important under recruitment constraints.

Hursley was different; both fixed term and permanent contracts were used frequently. While the Lab sub-contracted at high market rates for scarce skills, it also offered individual term contracts on the regular salary scale in support areas.

As of 1992, all graduate employment offers would be fixed four year contracts because of the prolonged business downturn. With the completion of the first batch of fixed term contracts, personnel insisted on these employees either receiving a permanent contract or being released. Hursley line managers were arguing for contract renewal, and implicitly questioned the traditional policy of lifetime employment.

Long-term vs Short-term Pay Orientation. The salary scales emphasise long-term financial goals through incremental improvements. However the yearly review and salary adjustment focus on the short-term. Stock purchase plans are long-term, with the exception of the recent linkage with improvement in customer satisfaction. The pension is definitely long-term, but the repetition of early release schemes has emphasized the short-term. While many of the awards target performance within a year or less, others are more long-term such as accrual of benefits from a suggestion or patent. All in all, there has been a minor pay shift towards the short term.



## **STRATEGIC USE OF HARD BENEFITS**

The hard benefits offered in the 1980s were a continuation of the package launched in the 1960s. Conceived in a decade of growth, the personal contract was meant to ensure competitive recruitment and retention within a policy of lifetime employment and single status. Performance-related pay linked performance requirements with financial rewards.

Introduced in the 1970s, the objective-based performance evaluation presented difficulties in defining appropriate objectives for professionals and managers. Joint involvement of manager and employee, use of indicators rather than proven outcomes, and frequent interim review of objectives helped to make the system work.

Change began to accelerate in the late 1980s with a small shift from long-term to short-term pay orientation. Downsizing and the exiting of expensive senior employees became pronounced in the 1990s. Pension penalties for early retirement were minimized and other incentives added to increase the outflow of progressively younger employees. The creation of Skillbase in 1990 helped by establishing a mechanism by which consultancy contracts could be offered to retiring employees, and IBM would retain access to their skills.

Fixed-term contracts were used more widely to recruit graduates and recently retired people. This approach permitted some recruitment of strategic skills while respecting headcount targets of permanent employees. It also provoked serious discussion about the changing commitment of IBM to lifetime employment and the nature of employment security.

Employees began to share in the risk in 1990 with the basic salary increase linked to improvements in customer satisfaction. Senior management sent a clear message that salary expectations would have to be in line with business performance.

Overall, then, adjustments have been made to the policies and practices covering hard benefits starting in the late 1980s in response to the need for rapid improvements in business performance. The pace of change was slow and consistent with the strong IBM culture of lifetime employment and respect for the individual. Acceleration of change in hard benefits in 1991 was dramatic (e.g., salary freeze) and reflected IBM's deteriorating performance in the recession.

## **SOFT BENEFITS**

IBM (including Hursley) consistently offered a variety of soft benefits, but important changes began to take place in the mid 1980s to improve business performance, with numerous changes in the early 1990s. Modifying the challenging work, focusing training to business requirements, and redefining employment security were the more significant changes. In addition, new ways of **recognising employee contributions** were introduced in the Lab: world-wide internal conferences organised by the new IBM Academy (1988), and the Hursley Authorship Recognition Programme (1991) rewarding researchers for publications and speaking at conferences to increase outward looking and visibility.

Prior to the 1991 reorganisation, **forced relocation** of hardware staff to the manufacturing facilities **disrupted community ties**. With the reorganisation and the slimming of corporate personnel, the annual UK-wide survey of employee



satisfaction was abandoned, leaving each business area to decide whether it wished to compensate for **diminishing formal listening/sensing**. The reorganisation also froze and then diminished **career movement** opportunities as both managerial and support positions were viewed as costs. However, the technical career path was strengthened, and mentoring was introduced in the Lab to support team working and outward looking.

The interviews indicated a recent loss of confidence of IBM employees in the future of the firm. In the 1980s, employees continued to believe that IBM was the IT leader and accepted the positive views of management shared through internal communications. In the 1990s, employees were confronted with messages and actions from within corresponding with the external criticisms (IBM-UK Annual Reviews, 1991, 1992). The **deteriorating company image** became widespread, and IBM survivors began to doubt the future success of their firm.

Modifying Challenging Work. Within Hursley, broader technical roles were introduced in the mid 1980s and included people responsibilities, a focus on revenue-generating, and client contact. The years 1991 and 1992 witnessed several changes in the work organisation and job responsibilities. Broader technical roles were reinforced, and greater depth of technical skills and productivity was emphasised. Specialised and autonomous groups were introduced.

Simultaneously, management became more involved in assembling teams across boundaries, and managing skills in the long-term. With a larger span of control after restructuring, they had less involvement at the technical and team level. Line managers also took on more personnel administrative work and lost some



control over recruitment. Contract managers were redeployed into production roles.

Reactions to these changes have been mixed among professionals, whereas managers have accepted the changes as necessary and open to modification.

Focusing Training on Business Requirements. The training culture of IBM has been a strong selling point in attracting people and has made redeployment feasible. In response to graduate dissatisfaction, their contracts gained a training clause (1988) locking-in job-relevant training. The arrival of a new software mission at Hursley (1990) and the subsequent creation of Skills Development has prompted more effort to tie training offers to business requirements rather than to employee preferences, and recruit skills for long-term business requirements.

Redefining Employment Security. In the 1990s discussions of involuntary layoffs have spilled-over from the public forum into IBM itself. With the recent downsizing, massive redeployment and new mission of the Lab, people have become less secure. The voluntary early release schemes targetted progressively younger people. The Career Transition programme targeted younger people who were in surplus areas. Persons with key skills were not allowed to benefit. A few very good people left and this was viewed as inevitable. The targetting of younger people created insecurity for all survivors.

"People are uneasy about whether IBM is a safe bet. The impression is that the attrition rate is lower here than elsewhere. I wonder whether the best are leaving." Coordinator in CICS Area

Modifying Career Development. The organisation also responded to care needs expressed around career development. The focusing of graduate training to

business requirements was partly a response to graduate criticisms. They wanted job-relevant experience and training as soon as possible to become professionals in their own right.

The shift towards self-directed career development in the late 1980s also responded to employee dissatisfaction. The new HRM system offered a supporting framework, and employees would be given the ability to prompt managers to keep material current.

## **STRATEGIC USE OF SOFT BENEFITS**

Numerous benefits were changed to support the pressing business requirements of the late 1980s and early 1990s. Most of the changes were closely tied to performance requirements. Such adjustments have taken place in the past but not with the same amplitude.

The few care-driven changes are understandable when one remembers that IBM offered a rich package of soft benefits. Additional enrichment was unlikely.

A few of the changes were "costs" that IBM was prepared to accept. Deterioration in company image was an unavoidable consequence of the 1991 restructuring. Increasing employment insecurity was considered unfortunate, and redefining lifetime employment was a reactive process. Similarly, the abandonment of centrally-sponsored employee surveys was a consequence of the shrinking of Personnel.

## **CONCLUSION: COMBINING HARD & SOFT BENEFITS**

People were recruited and retained by IBM through a variety of hard and soft benefits: competitive salary and benefits, interesting work, and the image of a successful and responsible company. Retention over time also depended on "being respected by colleagues".

Since the mid 1980s, most of the changes in hard and soft benefits aimed to improve business performance. The crisis in 1991 provoked multiple changes in benefits during and after the restructuring. Performance-related pay was no longer sufficient to ensure high business performance.

IBM believed that it had a winning formula: sophisticated HRM and stable core policies of lifetime employment, redeployment through employee flexibility and retraining, and respect for the individual. Coupled with performance-related pay and an attractive benefits package, IBM believed that incremental internal changes were sufficient to master market conditions. The firm, however, had great difficulty in adopting a new approach.

In the author's view, two changes were important steps in producing a new approach: use of term contracts, and the creation of Skillbase. The greater use of four-year term contracts for graduate recruits proved to be a satisfactory version of employment security, to management's surprise. Unfortunately, their wider use was being resisted by Personnel. Innovation in stimulating retirements took place through a combination of enhanced financial incentives and continuation of working relations with colleagues through Skillbase consultancy.



In both cases, we note a redefinition of lifetime employment at the beginning and end of a person's career through the modification of the employment contract. A more flexible work contract gives the firm access to specialised skills and flexible control over headcounts. Furthermore it fits well with employee aspirations. IBM has been slow in recognising the changing expectations of young graduates and their own mature employees.

These innovations fit into the IBM strategy of using a network of firms and individuals to support the core IBM activities. The spin-offs of the printing business (through minority ownership in Lexmark), the property management area, and training and education (through Skillbase) involved transferring some IBM employees to the employment of the new venture. New terms and conditions of employment are offered with a stronger business-performance link and fewer expensive benefits.

## **SUPPORTING BUSINESS STRATEGY WITH A SKILLS SUPPLY STRATEGY**

A summary of the link between business strategy and components of skill supply is presented in Table 4.3. From the perspective of Hursley, four changes in business strategy took place in the 1980s and 1990s: the push on manufacturing efficiency and quality (1985), greater customer-focus (1985), the dedicated software mission (1990), and the productivity drive (1991).

The integration of the hardware areas of Hursley with the manufacturing plants started with cross-functional project teams and joint management teams, and ended with the block transfer of the R&D workforce to the plants. Modifications in work organisation followed by a structural reorganisation prepared Hursley

**TABLE 4.3**  
**LINKING BUSINESS STRATEGY**  
**& SKILLS SUPPLY IN IBM**

<u>Components of Skill Supply</u>	<u>Business Strategy</u>			
	Efficiency & Quality	Customer Focus	Software Mission	Produc- tivity
	1985	1985	1990/91	1991
Initial Recruitment			X	X
Initial T & D				X
Work Org./Job Design	X	X	X	X
Perf. Appraisal				X
Compensation				X
Training	X	X	X	X
Career Develop.			X	X
Exiting			X	X

for the dedicated software mission. In a similar manner, the push for greater customer-focus in IBM-UK was supported by cross-functional teams involving Hursley. While the first of these strategic thrusts was incremental and opportunistic, the second was explicit with an intentional skills supply pattern. However, the pace of change was slow in both cases.

100% Software Mission. The 1990-91 plan for Hursley was for redeployment and early releases with careful attention to keep those people with skills supporting the new mission. The Lab's managers were mobilised to restructure the Lab with a concern for skills. The subsequent creation of the Skills Development area helped to cement the new interest in strategic skills. In terms of levers, work reorganisation through redeployment, and skill-sensitive releases were applied. This explicit skills supply pattern supported the radical and rapid restructuring of the Lab.

Productivity Push. Within Hursley, the redeployment of people into the new software areas and the serious shortages of experts in these areas highlighted the problem of productivity. Skills Development was created, and thereafter the skills board and the skills process council. Recruitment and internal movements were carefully controlled to support the new mission; career development was oriented towards business requirements. At the same time, restructuring experiments were taking place to increase productivity and skill levels: the matrix of blue and green managers, and the core and focus groups. In summary, the strategic push for greater productivity made explicit use of several skill supply levers with the main ones being recruitment and work organisation.

To what extent were the above skill supply patterns intentional supports for the business strategy? Did the changes in skill supply components reinforce each



other? The two strategic changes of 1985 tackled different problems, the first a manufacturing concern for quality and efficiency, and the second a general problem of costs and productivity with inadequate customer-facing. Each change prompted a similar and isolated response from the Lab: incremental changes in work organisation. In one sense both strategic changes aimed for closer contact with customers whether internal (manufacturing) or external. However, there was no evidence of a coordinated strategy involving both thrusts.

The software mission introduced in 1990 benefited from the greater integration of the Lab's hardware areas with the manufacturing plants. It became realistic to spin-off these areas and merge them formally with the plants. The structural separation was opportunistic, and fit well with the preoccupation to increase IBM's activity in software. The removal of hardware missions proved to be very beneficial for the rapid mobilisation of management around the software mission.

The customer focus thrust started in 1985 did prepare the ground for the productivity push of 1991. Revenue-generation was given added attention and more people were tied to such activities through redeployment. Cross-functional teams became more common. The changes of 1991 continued the emphasis on redeployment, job redesign, and exiting expensive and surplus people, but the amplitude of the changes was new. Zero recruitment was followed by fixed-term contracts only.

Lastly, the software mission and the push for productivity came to be one and the same, partly because of their close contiguity in time, and partly because of the over-dependence on redeployment to create the new software areas. The downsizing of 1991 meant that more was expected of fewer people. This time the Lab was innovative in its search for greater productivity. The pace of change was

rapid: a major restructuring and downsizing left the surviving managers scrambling to secure improved business performance.

## **INFLUENCE OF HRM ON SKILL SUPPLY PATTERNS**

HRM within IBM-UK can be discussed under five features: the firm's inheritance, top management, the absence of unions, personnel management style, and manpower planning. Did these features facilitate or hinder required changes in skills supply?

IBM's Inheritance. The firm's core people policies have remained unchanged for decades and have been applied world-wide. Full employment, single status, employee influence, and competitive equitable salaries and benefits were counterbalanced by controlled recruitment, generous training and education, and frequent employee redeployment. This package led to high employee commitment to the firm and a willingness to change jobs and reskill. This inheritance served the firm well in the 1960s and 70s, but no longer in the 1980s and 90s. Despite the clear signs that the company was in trouble, IBM senior management continued to strongly support the core policies while pushing for incremental changes in business direction and work organisation. With the business crisis of the early 90s, both management and employees of IBM doubted whether the core policies could be maintained indefinitely. Nevertheless little change has occurred in the core policies while changes in business direction have accelerated.

Top Management. Senior management within IBM are all in-bred and hold to the traditional IBM beliefs and policies. Though they are called upon to set the business direction and goals, they are also constrained by the firm's inheritance and their own socialisation. Gradual change was preferred. Within the larger



management group, a balance between organisational structure and the culture of champions was fostered. It originally was viewed as an innovative solution for managing a large and complex business. Senior management introduced multiple structural changes in the 1980s but gave less attention to altering the management culture. Devolution of decision-making and exiting of some expensive older managers and professionals had some impact on management roles, but the dominant role of champions continued. Given that most champions are seasoned IBM people, they likely continue to view structure (and the related work organisation) as complementary to their pivotal role as change agent. The crisis of the 90s did give senior management the justification to radically alter the organisation, and to exit large numbers of middle managers.

Absence of Unions. The core people policies of IBM were inspired, in part, by the desire to keep unions outside. The firm succeeded in offering a package of hard and soft benefits which created employee commitment. The absence of unions gave IBM's management the freedom to modify work organisation and job design. All that was required was employee flexibility which was secured through the package of benefits. Thus the core people policies that guaranteed the continued absence of unions limited the levers that management could call upon to influence skills supply. In particular, rapid downsizing through layoffs was not an option, and recruitment of scarce skills through competitive packages of rewards was difficult when internal salary equity was the dominant consideration.

Personnel Management Style. While personnel assisted and guided the line manager, the latter remained the primary link to the employee and the main management decision-maker. Granted, all IBM people were immersed in the performance and care-oriented culture fostered by the core people policies.



Within this context, tension existed between line and staff in that line managers were inclined to make trade-offs in favour of business requirements while personnel defended the care and development needs of the employees. Despite this constraint, line managers were able to respond to immediate business requirements such as recruitment and retention of skilled team members.

Hursley Lab had its own personnel function including training and education. While the tension described above existed at senior levels within the Lab, at lower levels Personnel was seen as administrative in nature, relieving line managers of tedious work and leaving them free to concentrate on R&D matters. Unfortunately some line managers and senior professionals had weak people management skills. Little attention was paid to people issues that did not have immediate and local work impact. Lab-wide skills supply was not addressed.

With the restructuring in 1991, the personnel function lost some of its activities to the line manager supported by a HRM system. The middle manager became more involved in skills planning and management. This rearrangement of role boundaries has created more emphasis on the contribution of skills to organisation-wide business requirements.

Workforce Planning. Practices were very traditional with a focus on global headcounts and ratios of people in different functional and business areas. Skill concerns were tackled under the release schemes in the 1991 reorganisation. Skills planning has taken place in IBM for decades, but always to tackle a particular problem, such as redeployment of a surplus skill group. Significant effort was expended to monitor skills in the 1980s but not for skill supply reasons. Currently the Lab has set about creating a skills development

organisation and skills supply strategy. It remains too early to make conclusions about this response to the new software mission and the reorganisation.

In conclusion, several features of the HRM culture were tightly linked around the core people policies. Changes in skills supply could only be gradual and slow at all levels of the organisation. Only the crisis and restructuring of 1991 were able to accelerate the pace of change, but the core HR policies were modified only at the edges.

## **CHAPTER 5: BT CASE STUDY**

This chapter presents the case of BT, a recently privatised telecommunications organisation which has undergone tremendous change. The chapter follows an outline similar to that of Chapter 4.

### **OVERVIEW OF THE ORGANISATION & SENIOR MANAGEMENT**

BT plc (British Telecom) offers a wide variety of telecommunication services and equipment to residential and business customers primarily in the UK. It has facilities throughout the UK with corporate office in London. The main R&D facility is situated in Martlesham with offices in the surrounding area, London, Belfast and Glasgow. Originally part of the Post Office and the monopoly supplier of voice transmission, BT now competes with Mercury plc using fixed-link networks and with numerous firms offering value added networks (VANs) and mobile communications.

According to BT's 1991 Annual Report, the firm weathered the recession with a turnover of £13.15 billion (6.8% increase from 1990), profits after taxation of 2.08 billion pounds (up 16.3%), and earnings per share of 34 pence (up 16.4%), a performance hampered by low efficiency according to City analysts.

The privatisation of BT in the 1980s was guided by Sir George Jefferson and Ian Vallance, and supported by the recruitment of private sector talent. In March 1990, BT initiated a major restructuring (Project Sovereign) with an exceptional charge of £390 million for severance payments to employees. Rapid downsizing was continuous between 1991 and 1993.



## **ENVIRONMENT OF THE ORGANISATION**

### **PRIVATISATION**

The 1979 conservative victory of Margaret Thatcher signalled the beginning of a decade of resizing and reshaping the civil service into a customer-oriented service. Vickers and Yarrow (1988) have documented the first wave of privatisation involving firms with limited market power, and the second focusing on utilities and their regulation.

Privatisation of BT took place during a decade of market growth averaging over 5% for inland calls and over 10% for international calls, with slower growth during the recessions. BT supplied about 95% of these markets, and Mercury the remainder. Rapid growth took place in the new markets of mobile communications and added value services where competition was more pronounced.

The **British Telecommunications Act of 1981** established BT as a public corporation and introduced competition through licensing provisions. BT was obliged to supply the network platform on which competitors offered basic and value-added services. The **1984 Telecommunications Act** created the Office of Telecommunications (OFTEL), abolished all of BT's exclusivity, and imposed wide responsibilities (including promoting research and development). A long list of safeguards was stipulated because of the integrated nature of BT's operations and its dominant influence as supplier, purchaser and provider. BT lobbied hard to maintain its integrated structure, and found some support from a government interested in maximizing the proceeds from selling BT's shares.

Price control was imposed such that the price of basic services had to fall in real terms annually. OFTEL also investigated quality of service. It concluded that over the period 1981-1986, BT's service had not improved. OFTEL considered making BT liable for losses to users caused by faults and poor service. BT management was spurred to accelerate modernisation and quality improvements.

In 1991, the government introduced **"Competition and Choice: Telecommunications Policy for the 1990s"** (DTI, 1991). The duopoly of BT and Mercury was terminated, service barriers between cable and telecommunications were removed, and greater tariff flexibility for BT was granted.

With privatisation, City analysts and pension fund managers became harsh critics. BT compared unfavourably with other telecommunication firms (TELCOs) as measured by the number of lines per 1000 employees. In 1990-91 European operators averaged 186 lines and U.S. operators 221; BT averaged 124. The City pressured BT to downsize and improve profitability. Government sympathy was implicit for future stock sales; flotation of half of its holdings took place in November 1991. Privatised BT has found itself under continuous pressure from OFTEL and the City with no relief expected in the 1990s.

## **TECHNOLOGY**

The maturing of the technologies of telecommunications (optic fibres and digitalisation of switches and apparatus), and computer hardware (expanded power) and software (intelligent systems), created the push for the transition from the time-tested electromagnetic-based network to the electronic-cum-digital network on a world-wide basis. The transformed system promised lower



operating costs, reliability, flexibility (eg. remote monitoring and configuration), and new capability in added-value services.

## **CONCLUSION: BUSINESS IMPERATIVES & HRM STRATEGY**

The 1980s environment of BT was marked by sustained political and regulatory pressure and growing competition in all markets. Whereas BT had pursued public sector goals of low cost universal service and high employment levels under stable monopoly conditions, it was now required to offer a broader range of quality services at competitive prices. Management was pressed to transform BT into a more flexible organisation. In order to satisfy more discriminating customers and counter cost pressures, a leaner and higher performing organisation was required. The new BT would have fewer employees but presumably with appropriate breadth and depth of skills.

## **BT'S CORPORATE STRATEGY**

### **MANAGEMENT STYLE: LEARNING TO COMPETE**

Sir George Jefferson (1980-1987) and his successor Ian Vallance (1985-1993) understood the importance of reshaping the skills of the senior management group for privatisation and competitive performance. New blood was brought into the senior management ranks between 1981 and 1990. In 1988, D. Day became managing director of the new division Communications Systems, formerly with Plessey and IBM. Alan Rudge, formerly chief executive of ERA Technology Ltd, joined in 1987 and became director of R&D in 1989. John Steele of IBM-UK joined in 1989 as Group Personnel Director. In September 1991, Michael Hopher,



chief executive of Lloyds Abbey Life (insurance and loans), became the managing director of BT. All of the new board members and senior managers belonged to Vallance's age cohort. A slow decentralisation from the board to senior management took place accompanied by frequent restructuring of the organisation. Vallance set up a management board (1988) to review operations and authorise certain large capital and business projects. The Director of Group Personnel and Corporate Services was included.

Initial business strategy included rapid modernisation, increasing operating efficiency and preparation for competition within the U.K. and internationally. Marketing in all divisions would play an increasingly important role to enhance services and introduce new ones. Staffing levels would be reduced over the next few years (1981-85) by natural wastage and early retirements. This downsizing emphasis persisted with the exceptional period of 1987-1989 when the push on modernisation and improved services reversed the trend.

The new strategy was supported by two major reorganisations: Districtisation in 1984 and Project Sovereign in 1991. Districtisation took place for improved efficiency and customer service. One layer of management (regional office) was removed, and 1000 managers exited. Now 30 districts (replacing 61 areas) reported directly to BT-UK headquarters and behaved as self-sufficient trading units. New techniques were introduced: stock control, customer data bases, and financial control systems. Though Districtisation achieved the intended goals, it fragmented management priorities and created uneven service quality across districts. This highly decentralised structure did not serve well the nationally-oriented business community.

Under Sovereign (1991), rapid downsizing in management and other levels took place (see Tables 5.1 and 5.2). The new structure based on market segments would create improved performance: large service zones in personal communications (PC) and business communications (BC), both supported by an integrated network and a coherent portfolio of products. All inter-divisional relations were formalised in a matrix structure of customer-supplier obligations and service level agreements (see Figure 5.1).

The above structural changes were directed at the twin goals of economies of scale and market focus. The autonomous districts were successful vehicles for introducing changes in management systems, encouraging managers to think commercially, and developing well-rounded managers as careers were built within a district. Sovereign pushed economies of scale even further but superimposed formal inter-dependencies.

## **GLOBALISATION**

BT was a major shareholder of INTELSTAT (consortium of satellite users) from its inception, and a leader in the use of undersea cables across the Atlantic and elsewhere. As part of the Post Office, BT focused on the U.K. exclusively and did consulting work abroad when solicited. With privatisation, BT initiated new investments (e.g., Mitel in 1985, and 20% of McCaw Cellular Communications in 1989). BT gradually built up partnerships and alliances in selected international markets (NA, Europe, and Southeast Asia). Ownership of infrastructure was avoided while contracts to create and maintain networks were sought. By 1991, BT employed 12,000 persons overseas. However...

**TABLE 5.1:**  
**BT WORKFORCE STATISTICS 1981-93**

	<b>Total Recruitment</b>	<b>Turnover</b>	<b>Workforce Year End</b>
1981/82	12,964	5.3%	251,647
1982/83	8,682	6.0%	245,976
1983/84	10,472	6.0%	241,124
1984/85	9,075	6.2%	235,178
1985/86	13,212	7.7%	230,184
1986/87	16,311	8.7%	223,084
1987/88	25,577	10.4%	225,132
1988/89	30,505	10.5%	231,982
1989/90	20,761	9.1%	231,523
1990/91	7,830	10.5%	215,366
1991/92	6,105	10.3%	199,325
1992/93	3,494	18.9%	165,210

**Source:** BT Employee Statistics Report 1992-93

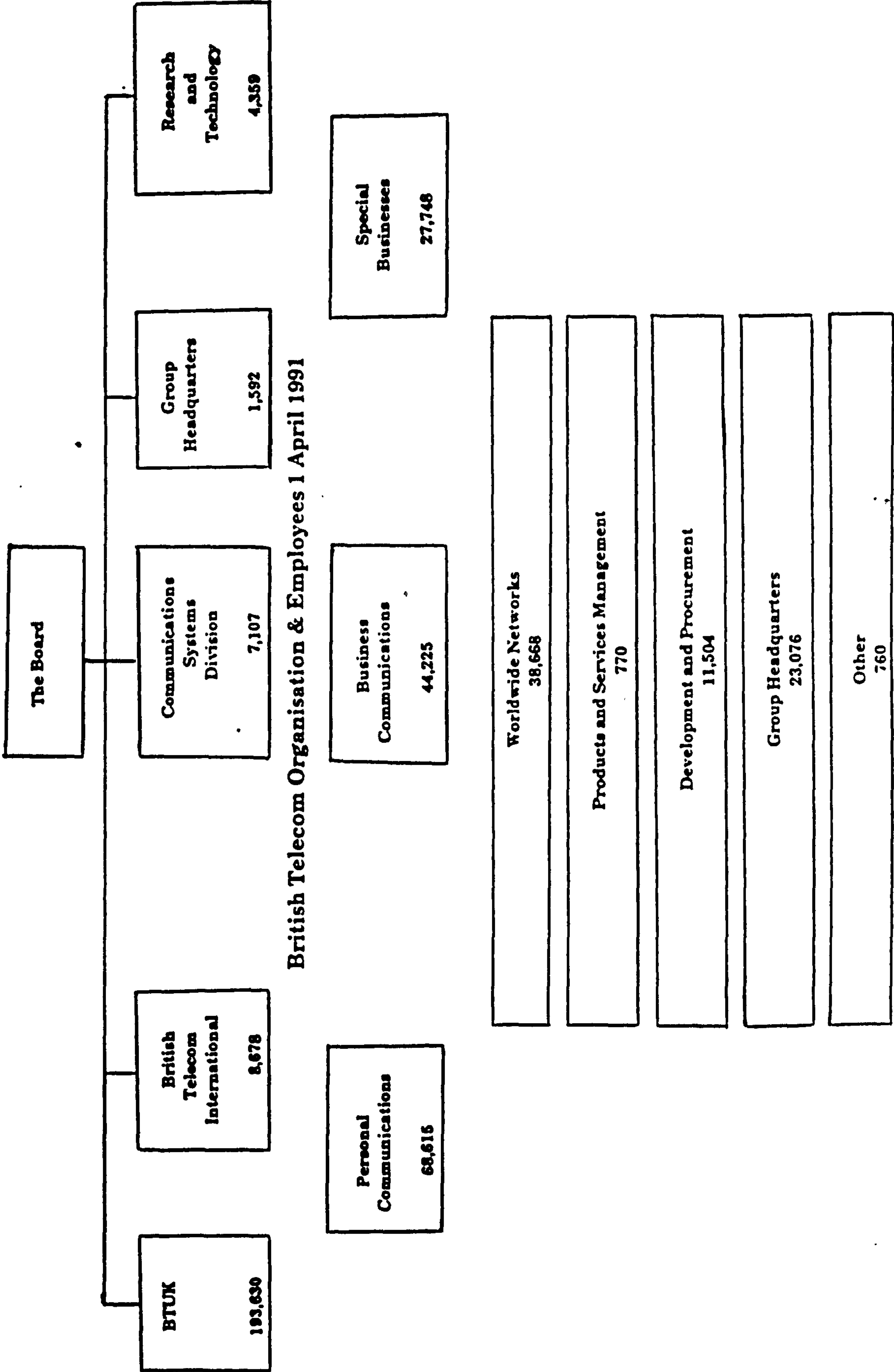


**TABLE 5.2:**  
**RECRUITMENT AND WASTAGE IN BT, 1984-93**

PCG	Recruitment as % of Grade Group	Wastage as % of Grade Group	Overall Gain (+) or Loss (-)
84/85	N.A.	6.0	N.A.
85/86	7.8	5.0	+
86/87	4.8	7.2	-
87/88	3.7	9.1a	-
88/89	2.8	9.0a	-
89/90	4.6	9.4a	-
90/91	2.7	15.1a	-
91/92	6.6	3.4	+
92/93	2.3	2.1	+
<b>MPG</b>			
84/85	N.A.	5.8	N.A.
85/86	4.4	6.5	-
86/87	5.0	6.4	-
87/88	3.7	7.7b	-
88/89	5.3	6.4	-
89/90	4.1	6.0	-
90/91	1.8	16.7a	-
91/92	3.8	3.1	+
92/93	1.4	13.6a	-

**PCG** Personal Contract Grades  
**MPG** Managerial and Professional Grades  
**a** Increase due to voluntary redundancies  
**b** Increase due to voluntary resignations

**FIGURE 5.1:  
BT ORGANISATIONAL STRUCTURE AND EMPLOYEES  
BEFORE AND AFTER APRIL 1991**



"We're not sure whether we want to build our business by putting British expatriates overseas or whether we ought to rely on local staff." Personnel Development Manager, BC

## **MODERNISATION**

The 1970s and 1980s saw the gradual upgrading of the larger Strowger electro-magnetic exchanges by an overlay of electronic apparatus. They became semi-electronic exchanges known as TXE4. Existing copper transmission lines in the trunk and between exchanges also were digitalised by electronic overlay.

The new board (1981) planned for a major modernisation programme to compensate for inadequate investment in the past, but in fact, the programme accelerated only in the mid 1980s. Key elements included System X (a computer-controlled fully electronic digital exchange for the local and trunk exchanges), optical fibre cables in the trunk lines and between local exchanges, and finally optical cables between major customers and local exchanges. Intelligent systems were embedded in the network for traffic control, and remote monitoring, testing and repair. BT also improved basic customer service: the pay-phone service was modernised, and the speed of telephone fault detection and repair was improved.

Initially engineering-driven, modernisation in BT was pushed by rising customer expectations and the criticisms of OFTEL and the City. The improved network also benefited from the new Customer Service System which coordinated the interface between external customers and BT people across functions in the district.

"The key to the five year plan are completing network modernisation, reducing unit costs, and increasing functionality to provide specific products and targeting markets." Strategic Planning Manager, WN



## **ALIGNING RESEARCH & DEVELOPMENT**

BT had a strong R&D division driven by engineers. In the 1970s, R&D was dominated by the requirements of the switching System X. Hardware development was paramount and hardware skills were in high demand. By the early 1980s, support for manufacturing was required, but otherwise the focus shifted to software applications, support for System X, and improved digital capability in the network. Fewer hardware specialists were needed. Although R&D doubled from £123 to £243 million between 1981-1991, investment as a proportion of revenue was reduced from 2.7% to 1.8% (BT Annual Reports) in keeping with its growing service orientation.

Aligning R&D activities to other business concerns and demonstrating value for money were growing concerns. With the likelihood of privatisation (1982) three sponsorship categories were created: corporate research for platform and futuristic technologies; work sponsored by Divisions; and work carried out for outside organisations. New accounting arrangements were established to enable the true costs of R&D to be carried on the budgets of the sponsors. Projects with a visible commercial benefit in the near future were given priority. Software skills gave benefits quickly when compared to hardware contributions, could be flexibly deployed, and consequently grew in importance. In the late 1980s, renewed emphasis was placed on improving BT's internal network operations.

"Current challenges are historical... R&D activities have not always been perceived to be of value." R&D Personnel Director

## **TOTAL QUALITY MANAGEMENT (TQM)**

TQM was seen as a framework for culture change. In 1985, Ian Vallance, then managing director of Local Communications Services (the largest Division), supported TQM under the leadership of John Jarvis, the first Director of Quality Strategy, and David Kohler (recently retired from IBM). Two goals were set in 1987: to reduce the costs of poor quality by 50% over a five year period, and to attain 80% participation of the top 20,000 managers. Each operational unit created quality improvement plans and projects owned by the senior management group of that unit, and a quality council to monitor and review progress. Quality concerns, especially for cost reductions, were integrated into the 5 year business planning cycle and the one year Quality Plan Budget.

This first wave of TQM had several impacts: a published value statement and a Quality Policy, wider use of teams and new decision techniques, more awareness of internal and external customers, and a recognition and exercise of new skills. However, many managers perceived that the BT board failed to support a broader quality culture.

"TQM was a separate initiative. It was supposed to get into the blood stream." Corporate Personnel Strategy, Senior Manager

Under Sovereign, TQM was renewed and accompanied by BT published values. Quality became a line management responsibility. A few hundred quality specialists remained to achieve standards (ISO 9000) and support line management. The hierarchy of quality councils was maintained. An organisation-wide training programme "Involving Everyone" was initiated.

## **CONCLUSION: BUSINESS STRATEGY & HRM IMPLICATIONS**

The slow pace of change in the period 1981-84 was followed by rapid change with the privatisation of BT. The leadership spent the time planning the transition and initiating its programmes. Thereafter, several management interventions pushed the organisation towards Districtisation, accelerated modernisation of the network, and TQM. With the rise of Ian Vallance to chief executive and chairman, and the inflow of private sector managers, the senior management team had the vision and drive to push change forward.

In order to compete successfully, BT had to identify its management strengths (operating the core network), new strengths needed (marketing, competitive acumen, and rigorous financial accounting), and weaknesses (manufacturing which in time was corrected by divestiture). The management team would need the skills to drive the globalisation strategy while maintaining dominance in the U.K. market. Improved organisational performance was sought to keep costs down and improve the quality and variety of services. Recruitment to cover skill gaps and intense training were required.

For R&D, aligning activities to current business concerns, improving network operations and servicing sophisticated customer needs was part of demonstrating added value. Flexible use of existing skills with recruitment of software and network skills supported this thrust.

Introducing TQM and building a hierarchy of quality councils helped to channel performance improvements. Recruitment of some outside experts and training of large numbers of managers took place. Though TQM was driven by a cost focus, it did emphasize customer focus, and new technical and team skills. Sovereign



continued the culture change by devolving quality concerns to the line, expanding training to all employees, and shifting the emphasis to process management.

## **RESEARCH & DEVELOPMENT: MARTLESHAM & OTHER CENTRES**

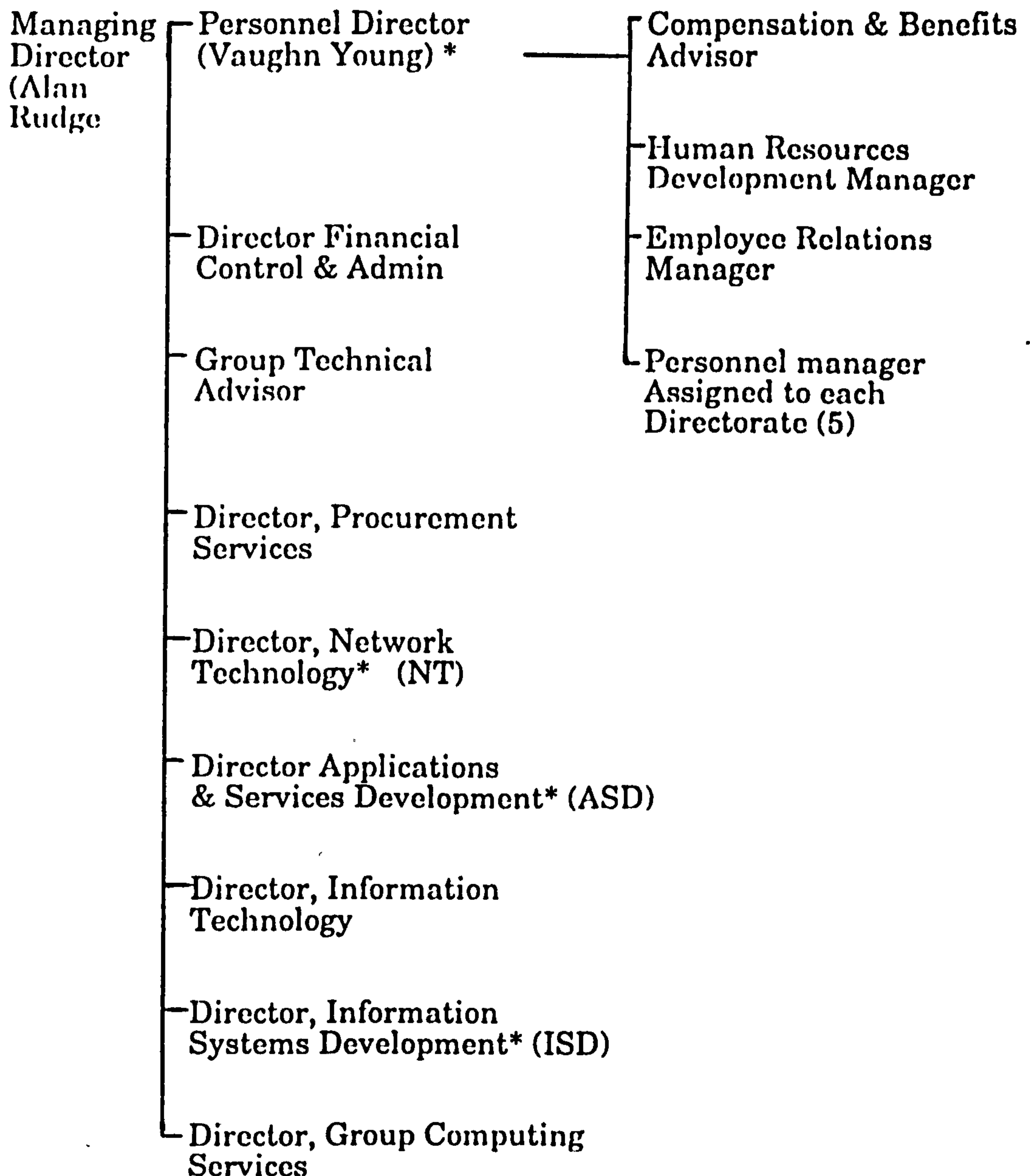
### **ORGANISATIONAL STRUCTURE**

- R&D and Procurement of major systems were consistently placed together in the organisation to help reduce the lead time between development and volume production (see Figure 5.2). Within R&D proper, there were two core directorates: Network Technology (NT) and Application & Services Development (ASD). As new topics were developed and old ones modified, sections were reorganised and new ones added.

Sovereign (1991) emphasised customer orientation and introduced a matrix of internal customers. R&D was already well on its way in this approach and had little adaptation to do. The new operating Divisions did clarify internal customer relations and facilitated sponsorship decision-making. R&D absorbed Computing Services and Information Systems Development (ISD), previously centralised in BT-UK. With the growing commercial emphasis within R&D, redundant services and development work were taking place, and the skillbases were converging.

The merging of these directorates had two main effects. First, financial management practices within R&D were adopted at the senior levels of the computing directorates. Previously locked into central computing support within BT-UK and paid by central overhead, internal customers now could choose an internal or external supplier and had to pay out of their own budget. Account

**FIGURE 5.2:**  
**STRUCTURE OF DEVELOPMENT AND PROCUREMENT**  
**APRIL 91**



\* Interviews took place in that directorate.

managers were introduced and internal business systems (e.g., time recording) were improved.

## **SKILLS STRUCTURE**

BT's grade groups have remained stable, but within them skills have changed depending on the location of the position within the organisation. Excluding subsidiaries, BT's workforce numbered 235,000 in 1985 of which 3000 were in R&D. By 1993 it had shrunk to 165,000 with R&D close to 3000 after a period of growth (software and network services) and recent shrinkage. A general shift took place in favour of managers, professionals and clerical people (see Table 5.3).

MPG covers first line and middle managers and all specialisms except for engineering. Two grade levels predominate: Manager/Professional MPG2 and Manager/Senior Professional MPG4. Within R&D and computing environments, MPGs predominate.

## **BASIC WORK ORGANISATION**

A team may have only one member, a senior professional on a small project. When it reaches 5-6 people, it is headed by a senior professional or a technical group leader. The latter may be responsible for 10 to 20 individuals, including agency people, covering a large project. A section has several large teams, a division several sections with 100-130 employees, and a department (business unit) five divisions and 600 employees.

Teams can be stable (a few years, sometimes more) with some movement



**Table 5.3: RELATIVE IMPORTANCE OF GRADE GROUPS WITHIN BT, 1985-93**

	<b>3/85</b>	<b>3/91</b>	<b>3/93</b>
<b>Grade Group</b>	<b>%</b>	<b>%</b>	<b>%</b>
Senior Management (PCG)		0.4	4.3
	14.6		
Management & Professional (MPG)		16.8	16.8
Engineering and Technology (ETG)	46.9	48.2	47.7
Operators	14.0	11.6	6.2
Clerical	13.6	15.6	18.7
Others	10.9	7.4	6.5
	100.0	100.0	100.0

Source: BT Employee Statistics Reports

within the research section. Other people are pulled in as required. On-going relationships across units help to maintain the team working. Work can also be contracted out on a specific budget allocation. Within a team, **technical activities** include capturing requirements, writing specifications, design, development, testing integration, coordination, quality audit, quality review of work, monitoring progress against time scales, computing support and safety. The recent commercial emphasis has led to **shorter work projects**: more emergency work with 2-3 week duration, more work with a 2-3 year horizon, and fewer projects with a 6-7 year horizon.

The introduction of **software centres** throughout the country created new challenges. Teams would sometimes include people widely dispersed. Simple partition of the work tended to take place, and low use of IT (eg., video conferencing) was made. Efforts were being made to improve it's use.

"They were owned by one section manager for their life and he had a view of their career over a great span of time. He had the ability to move them in and out of projects." Organisational Planning Manager, ISD

## **R&D CULTURE**

As part of BT, the R&D people shared in its inheritance. The Post Office created a top-down and rule-bound environment. In private, managers and employees ignored the rules while achieving satisfactory financial performance. Outside managers joining this **process-oriented and non-compliance** culture had difficulties adapting. There was widespread distrust of senior management who were viewed as political and influenced by public policy requirements. A **caring**

**and paternal climate** congruent with lifetime employment prevailed. Poor performance at the individual or project level was rarely confronted.

"If you were quietly disobedient that was all right." Personnel Director, WN

Cultural change in the 1980s was stimulated by the systematic recruitment of private sector executives and the exiting of old style managers. Empowering managers through objectives tied to their annual performance appraisal was pushing against the old culture of rules. Many middle managers were eager to adopt the new style. TQM (1985-89) encouraged a team approach and continuous improvement. Sovereign (1991) initiated drastic downsizing, and employees no longer assumed secure employment.

"A family organisation that you joined when you left school or university and retired at sixty or sixty-five. But with increasing pressures...it's become a sensitive issue." Head of Personnel Services

R&D also had its own local culture. The mainly professional workforce was oriented towards self-development and skill use. Their union got little support from a membership preoccupied with the work. The main lab at Martlesham was relatively isolated and encouraged social bonding. A similar cohesiveness was found in Glasgow and Belfast which was strengthened by the national culture. In contrast, the London workforce was cosmopolitan and highly mobile. Management also found that the younger researchers had a different style, more business-like in dress and comfortable with a business perspective.

## **IMPROVING FINANCIAL MANAGEMENT**

Commercial accounting of R&D was practiced since the 1970s with sponsorship from operating Divisions accounting for 60-80% of the work. Strategic research



was nominally controlled by corporate office which allocated it to both Divisions and R&D. Managers viewed project boundaries as flexible, "fiddling the books" when targets were not met within budget. The option of an external supplier was rarely used. Often Divisions looked to R&D staff to help determine the research topics.

**Alan Rudge** became Managing Director in 1988, and brought experience in transforming a quasi-public lab into a commercial operation. Meeting weekly with his directors, he introduced **rigorous commercial accounting** with performance targets for all divisions. Profits and losses became comprehensive and transparent, and operating Divisions were able to assess value for money. He obtained control of the **strategic research funds**. Operating Divisions continued to do some of the work, but financial accountability was imposed. The commercial emphasis on project management gave rise to a significant increase in bureaucracy around approvals and progress control. Some technical experts found the new environment unpalatable.

Alan Rudge also emphasised cross-divisional teams using traditional **matrix management** with a project manager and a technical manager. This approach grew in importance because a manager would seek absent skills in other divisions thus helping to avoid duplications. Managers became better informed of the skillbase in the entire directorate. Negotiation among managers became common.

Managers were pushed to use their staff fully for billing purposes. Managers had to attract sufficient volumes of work from the operating Divisions to maintain their people. They became more focused on skills, what they could deliver effectively, what skill shortages existed, and what training and development was

required. Some managers used TQM and process management efforts to improve their management of skills.

"Alan Rudge is very keen on making sure that we recover all our costs and are very accountable." Organisational Planning Manager, ISD

Sovereign provoked some delayering of middle management, but limited exiting took place in R&D. **General management responsibilities** were shifted up to section managers (budgets, managing human resources, and sales) and emphasised **technical project management** for the team leader with a wider span of control (10+). Section managers would concentrate on performance appraisals, career planning and training needs, tasks previously shared with group leaders. Divisional managers would focus on strategic issues and planning. Previously, everyone did some technical work.

Group leaders had tended to seek out small projects to maintain their groups. Now, the section managers would put together teams from across sections and divisions to achieve the best possible skills grouping, thus creating a **flexible workforce**. Some managers became uncomfortable because of the conflicting pressures of supporting the section while pursuing projects where skill requirements ignore section boundaries. One proposed solution is to create a Programme Manager with coordination responsibilities but no line staff.

## **CONCLUSION: BUSINESS STRATEGY & SKILLS SUPPLY IN R&D**

The new commercial orientation of BT impacted on both the management and professional groups of R&D. Some executive talent was brought in from the outside, but for the most part, training, work reorganisation, and new



management systems were the levers used to reshape the management style. Shorter project lifecycles to improve internal operations and support new products and services called for a workforce with abundant software and network skills. BT was obliged to compete for scarce skills as the IT sector grew.

## **SKILLS SUPPLY & THE INTERNAL LABOUR MARKET**

### **CURRENT SKILL NEEDS & SUPPLY**

The **rounded manager and professional** are needed to provide quality services to internal and external customers. Important skills include customer sensitivity, financial management and project management, leadership and vision, persuasion and selling, risk taking and team work.

BT has relied on the national graduate milkruns. Small numbers of specialists and experienced managers were hired regularly from the wider market. Thus, an even spread of new skills helped to cover critical gaps. In contrast, **training and development** of lower grades of managers and professionals were relied upon to adjust their skills.

The international strategy calls for experience in dealing with different national contexts and cross-national issues. Currently the preferred solution is to hire a local national as general manager and phase-out the **ex-patriate** after initial set-up.

Within R&D, intensive training of managers in commercial financial management took place for all managers down to technical group leader. Preparing a bid involved detail documentation of the human, material and other



costs. Performance targets were clearly stated, and project control followed budget and targets.

Software and Network Skills are in demand and less so for hardware skills. Professionals require an understanding of the VAX operating system, the data base "manager", and preferably some exposure to the electronic and digital BT switches. These firm-specific skills are in low supply. Meanwhile, there is a slow shift away from VAX to Unix with reliance on contractors. Small numbers of mathematicians, physicists, chemists and psychologists are needed.

"We are still 50% hard and 50% soft....If you think about most systems they are 90% soft and 10% hard." Divisional Manager, NT

At the customer end, software intensive **systems integration** requires that the professionals work directly with the customer. Previously done by one group, increased volume of work has prompted the creation of two specialised groups within Network Management, hence the need for **coordination and team work**.

Specialist vs Generalist Skills. In some areas (e.g., information technology), extensive recruitment of electrical engineers took place in the 1970s. These people proved to have basic transferable skills for the new areas. In other areas (e.g., software engineering), inter-changeability was higher across languages and computer models.

"What you really have is somebody (electrical engineer) good at learning and good at applying his knowledge to problems."  
Department Manager, ASD

ISD has gradually hired graduates with a broader background and an aptitude for IT. Communication skills have become more important to understand business problems. As the computing systems have matured, less technical expertise was required. Management has the view that communication skills and an appreciation for business problems are more difficult to train than technical skills.

Specifications. When BT withdrew from manufacturing of telephones and switches (1990), it meant little development would take place on this hardware. However, design of specifications increased for procurement.

Quality Documentation. In order to obtain BSI-5750 and ISO-9001 standards accreditation, software and code writing must conform to a quality procedure. This has prompted training programmes to put people through the steps.

## **INTERNAL LABOUR MARKET**

Emerging from the Post Office, BT had an internal labour market maintained by a policy of lifetime employment. Controlled recruitment and releases were coupled with promotion from within and training. Management had wide discretion to reshape and resize the senior levels, but less so at lower levels because of unionization. The emphasis in R&D was that of developing individuals while meeting business goals; downsizing was given less attention by both corporate and R&D managers. See Tables 5.1 and 5.2 for workforce statistics.

Recruitment & Turnover. National recruitment took place externally using the university milkruns, and internally using the posting system. Despite the downsizing trend, graduate recruitment was maintained, and specific growth

areas existed within R&D. Losses within these growth areas were viewed as undesirable, and competition in labour markets was keen with poaching taking place.

Organisation-wide wastage averaged 6.1% in the period 1980-1985, and increased to 9.4% for 1985-1990 due to voluntary resignations which were influenced by the privatisation of BT and ample alternative employment opportunities (financial services, Mercury, VANs). Significant differences in average wastage existed among the employee grades: clerical 15%, operators 20%, senior management 7.6%, MPGs 6.5%, and ETGs 4.6%.

Voluntary redundancies consistently accounted for 1% of the total turnover. They climbed to over 3% in 1991, 5.0% in 1992, and 15.7% in 1993. Improved operating efficiencies and delayering justified the release scheme. As of 1985-86, voluntary redundancy became the dominant mechanism for exiting senior managers, and became more so in the following years. Between 1985-91, 60% of senior managers left and only half were replaced by newcomers with commercial skills.

Turnover in R&D has been less than 5% which was considered the target. More common was internal movement within R&D and to the operating Divisions. Wastage varied by location and by specialty. Wastage was lowest in Belfast, followed by Glasgow, Martlesham, and trailing, London which reached 20% in the late 1980s. Specialties in high demand such as experienced software engineers and network professionals had higher turnover. Losses were more prominent among R&D employees with 1-9 years of service and 20-29 years old, a feature of the IT industry. For this reason, BT managers considered their retention record as generally satisfactory.



Promotion from Within. A comprehensive internal posting system exists which operates in a hierarchical fashion: posting in the R&D department, if unfilled then in the directorate, then in the division, then throughout BT. This system supports career progression on a localised basis, and has sufficient flexibility to tap the larger internal market when necessary. It also recognises the low mobility of most employees.

Use of Contractors. Numerous specialists (eg., UNIX experts) offered their services on contract through agencies, and R&D increasingly was prepared to offer the going conditions. This created some friction with regular employees. In critical areas, contractors remained on-site for 3 years.

Mobility. BT has facilities throughout the country and could accommodate the geographic preferences of many. Mobility was characteristic of high flyers and of young singles who lacked community roots. Most employees preferred to stay in their geographic region and locality. Attachment to the community and family considerations (children in school, spouse/lover with employment) are given priority. London outsiders are loathe to move to the capital because of the high cost of living. Londoners resist moving out because of ample career opportunities and the fear of losing the ability to return to a high cost environment.

"Our workforce are not particularly keen to move." Corporate Personnel Strategy Manager

It's difficult to get people into London: cost of living and cost of commuting." Technical Support Group Leader, ISD

## **HUMAN RESOURCE MANAGEMENT AS CONTEXT**

### **TOWARDS VALUING CORE HR ASSETS**

The culture of the Post Office valued the employees and their service to the public. At the same time, BT was more managerial in orientation. Since privatisation, senior management publicly recognised the importance of its staff to organisational success, but also emphasised costs and profits. These diverging messages did not persuade employees of their new importance.

"Our success depends above all on the talents of the people in British Telecom." Annual Report 1988-89

"When push comes to shove, people (employees) come to the bottom of the heap." Corporate Personnel Strategy Manager

Within R&D the traditional focus on long-term projects and the need to develop skills over long periods supported the value of human assets. The gradual emphasis on shorter-term projects in the 1980s did not appreciably alter this view. However, the new management style and business strategy gave rise to a line-responsive personnel function and a slimmer focused workforce. Personnel systems were made more responsive to management queries, in particular the employee information system (PRISM).

"PRISM is a great filing cabinet and retrieving is a great problem. You could not get meaningful management information." Corporate Manpower Planning Manager

### **PERSONNEL FUNCTION IN BT**

In the 1970s BT benefited from a professional and progressive, though bureaucratic and highly centralised, personnel function. In the 1980s the

personnel leadership underwent some external recruitment. A closer alignment of personnel with business concerns took place both at headquarters and in districts. Thanks to an aggressive stance with the unions, more management flexibility was obtained in work organisation, compensation and deployment.

"A lot of policies were written down and set in concrete as a result of negotiation with unions." Personnel Development Manager, BC

"Personnel managers within districts found themselves captive to the managing directors." Head of Personnel Services

The arrival of John Steele from IBM-UK (1989) marked the emergence of a new corporate personnel mission, that of supporting the line. He gradually changed head office appointments, moving people into and out of the field. Shortly, Sovereign restructured Personnel into two "organisations" for economies of scale and expertise: (1) a highly centralised Personnel Services with zone directors, and (2) a Personnel Policy Board (PPB) composed of divisional personnel directors with expert support for line managers within each division. The PPB considered shaping, sizing and structuring the workforce as a priority. Project teams were set up composed of headquarters and division people.

"John (Steele) is saying, We're here to support the line. What does the line want?" Corporate Personnel Strategy Manager

"Personnel has been positioned as reactive, and we want to move towards being a champion, a leader and shaper of change." Corporate Personnel Strategy Senior Manager

## **PERSONNEL FUNCTION IN R&D**

Personnel was part of the Financial Control & Administration Directorate for decades. With the arrival of Vaughn Young and Sovereign, and the creation of a



separate department, Personnel demonstrated its new ability to support line managers in solving people problems. R&D increased the number of personnel specialists who began to work closely with line managers, sitting as a member of the Directorate and department management teams. Administrative personnel numbers dropped and training was transferred in block to Personnel Services. Timely and flexible interventions were introduced.

"Personnel was seen as the policeman of the rules....Now managers make the decisions and we give options and advice." Personnel Manager, ASD

## **LABOUR RELATIONS**

High union membership diminished somewhat over the 1980s with the new labour relations laws making membership optional. Mergers led to 4 unions and employee associations instead of 30: National Communications Union, Union of Communication Workers, Society of Telecom Executives (includes R&D professionals), and Communication Managers' Association. Negotiations remained centralised, but created some flexibility within umbrella agreements. Management sought concessions on flexibility in work organisation and compensation. Within districts, Personnel gave priority to negotiating and implementing these changes, and tended to neglect other HRM areas such as workforce planning and career development.

Industrial action was taken periodically by the Post Office Engineering Union for benefits and security of employment. All unions opposed performance related pay (PRP) but management negotiated its entry for senior middle management, partly by strengthening direct communications with the management cadre and appealing to their career interests.

"We were not supposed to link the bonus and pay (of MPGs) in any way to the appraisal which is clearly nonsense." Manager, Support Systems, ISD

## RECRUITMENT

BT has retained its civil service inheritance of external national recruitment at low entry levels using fair and exhaustive procedures. Recruitment of experienced people increased in the 1980s. Internal competitions were filled according to civil service board procedures; promotion readiness was determined and later matched to a vacancy. Since Sovereign, special selections are run where a job is advertised and the best are chosen among the applicants.

Graduate Recruitment. Recruitment makes use of the national milkrun. The application process and initial interviews are confirmed by personal contacts within BT's university research programmes. R&D has strong links with York and Aston Universities. With Sovereign, graduate recruitment was removed from Martlesham and placed in Group Personnel. R&D was an exception within the old structure, and had argued their need to target quickly the "cream". Centralisation has meant the loss of rapid targeting.

Headhunting and Poaching. Senior management recently have approved headhunting and targeted advertisement in response to poaching in the networks area. Low key advances have been made. Personnel prepared a tailored package with pay as the main lever, followed by assistance in removal and relocation expenses. Such offers were normally at the personal contract level where information was not widely shared.

"I am now encouraging headhunting for people who we recognise as particularly good." Director, ASD

"Contractors do not affect the BT staffing post." Technical Group  
Leader 2, NT

## **TRAINING**

BT Training Organisation has a number of specialised colleges, notably in engineering and management, and recently in customer facing. A wide variety of courses are offered. Management training has recently been tied to competencies based on a series of interviews conducted throughout the organisation. Senior management routinely used the training organisation to support its programmes including TQM, leadership, team work and goal setting.

"BT Training did wonderful things...but you never heard about business objectives and customers. That is completely changed."  
Corporate Personnel Strategy Manager

"Giving people financial training was a major activity." Director,  
ASD

Sovereign created significant overlap in training in the two personnel organisations because of the practice of using line managers as part-time accredited trainers and divisional interest in management development. While Personnel Services argued for economies of scale, line managers insisted on maintaining internal training units for flexibility and skill-specificity. Sovereign also imposed more rounded technical and managerial roles, thus raising questions about the limits of training.



## **CAREER MANAGEMENT**

During the 1980s, linear career paths were based on seniority with the exception of rapid promotion for high flyers. These paths were disrupted by frequent restructuring and the accompanying redeployment of people, and by the gradual spread of PRP. Between 1985-90 tangible improvements were achieved only for finance. Worried about the high turnover in the southeast, accounting/finance posts were reorganised to conform to the training requirements for accreditation by the Accounting Society.

"Every time the company reorganised, the local schemes which had been put in place or were being planned collapsed....There was much frustration." Corporate Personnel Strategy Senior Manager

Since Sovereign, a concerted effort has taken place to install robust and standardised career management. Defining the business direction and management commitment to training and job development were seen as important for morale and retention. However the immediate effect of Sovereign was to prioritise redeployment and create pent-up demand.

BT Training had created the yearly planner, a tool for career planning under employee responsibility. Following Sovereign, the planner was adopted throughout R&D, and the manager (not the employee) was made responsible. In the old system, professional development was one box on the appraisal form and part of the appraisal review.

"Managers were pleased with what is emerging with more openness of employee's aspiration, more relaxed than appraisal counselling." Personnel Manager, ASD

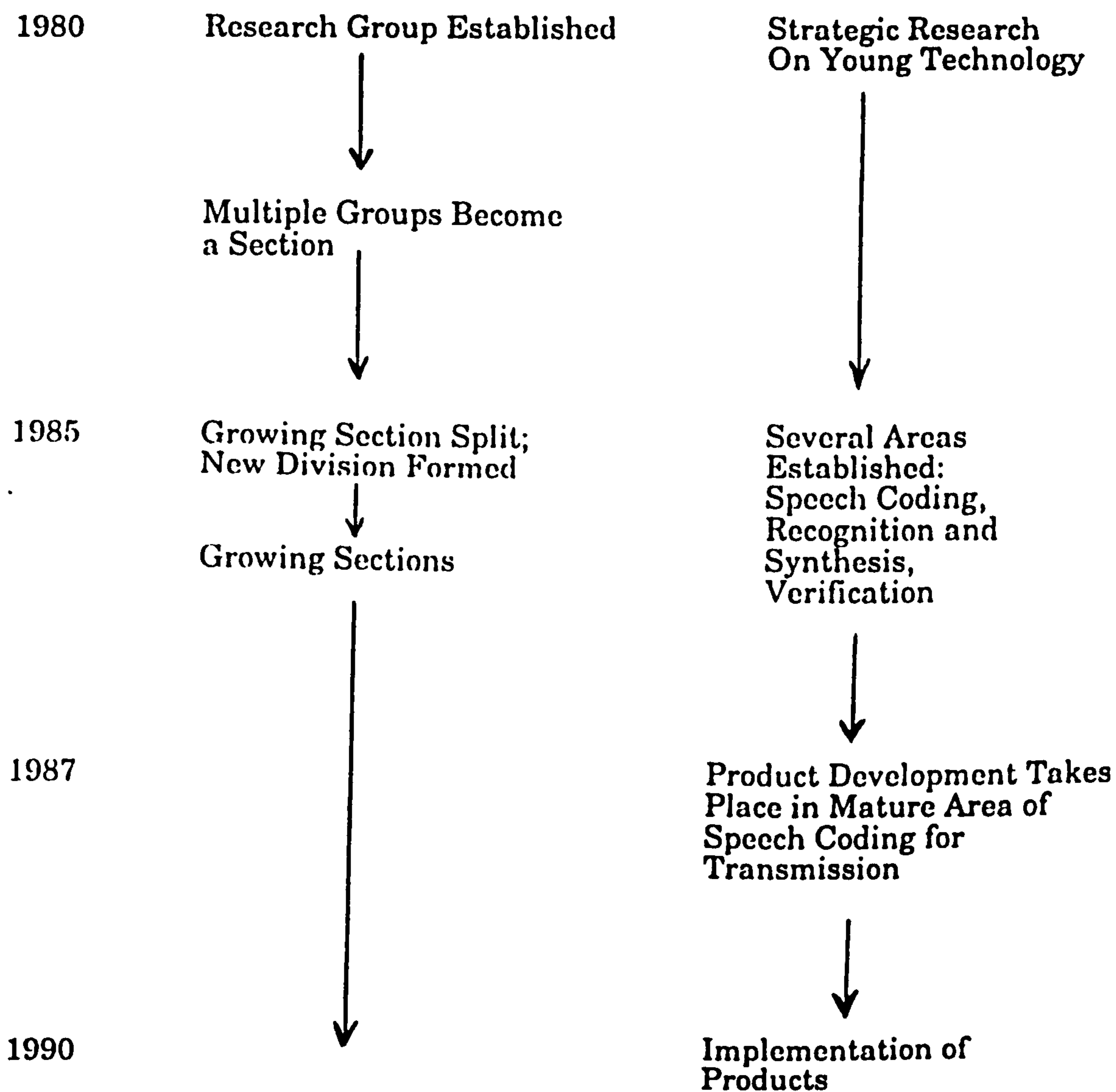
The section manager became responsible for career development both on and off the job. The individual plan is fed to the divisional manager who feeds it to personnel who arranges for formal training. The divisional manager holds the staff and training budget which ties into his yearly resource and business plans. Thus the opportunity exists to tie career development closely with the management systems.

## **TECHNOLOGY LIFE CYCLE & CAREERS**

In the 1970s and to a decreasing degree thereafter, the life cycle of a specific technology, the related R&D work organisation, and career development were inter-twined (see example in Figure 5.3). Supported by strategic funds, a researcher could **grow in a specific expertise** and take on more technical and supervisory responsibility over time.

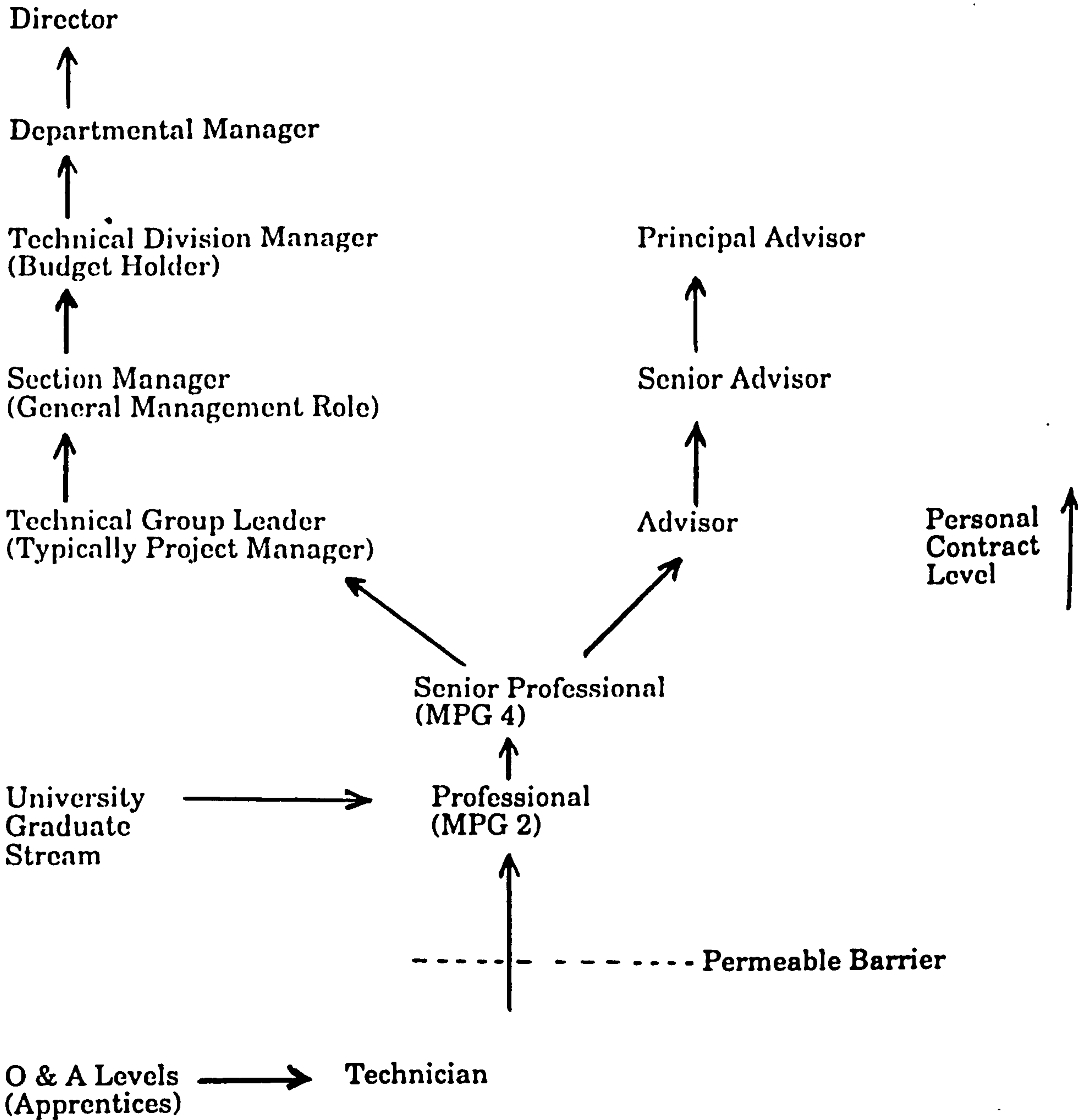
The multiplication of research groups in a new area leads to a dedicated section and later to a dedicated division. Maturing to commercial applications and products causes further reorganisation, and funding from operations supplements the strategic funds. This organisational growth creates **promotion opportunities** for the local experts. At the commodity stage, development becomes less profitable, withers or becomes absorbed by other divisions with larger scope. People are redeployed but do so from a higher career platform for continuing progress. Distant research horizons were common in the 1970s when technology drove the research, publications and patents were encouraged, and business applications considered secondary. With privatisation (1981) and the emphasis on commercial contributions within a 2-3 year horizon, **de-linking**

**FIGURE 5.3:  
TECHNOLOGY LIFE CYCLE -  
BT EXAMPLE OF SPEECH APPLICATIONS**





**FIGURE 5.4:  
BT CAREER LADDERS IN R&D**



between the individual's career and the technology cycle took place to an increasing degree. Management created, adjusted and disbanded teams more frequently.

"Over a 15 year career, somebody grew with the project, but the trouble is the projects and the technologies change too rapidly now." Department Manager, ASD

## **TECHNICAL CAREER PATH**

The position "Advisor" was used for a few technically gifted persons who refused managerial responsibility. Merit promotions took place without a promotion board, and were in effect so long as they remained in the designated areas. Most professionals targeted the more plentiful management positions creating a technical skills loss in the professional ranks and some poorly adapted managers.

With Sovereign, technical work was confined to the group leader and withdrawn from higher management. "Advisor" was expanded to a career path (see Figure 5.4). Unfortunately the implementation suffered in that people made surplus by the reorganisation became advisors and appropriate candidates (key people for specific projects) were overlooked. With rapid technical obsolescence expected, the technical career path generated scepticism, and managers were introducing Advisors cautiously and defining the positions incrementally.

"This guy is absolutely key to the project and should be an Advisor....He wants to remain as a technical guru." Technical Group Leader 2, NT

"The advisor career route is not well focused. We have only one Advisor in the division because I have taken a fairly softly softly approach." Division Manager, ASD

Computing Career Path. Sovereign prompted ISD to address career and performance feedback dissatisfaction. The new technical and managerial career paths were extended downwards. MPG2-MPG4 was segmented into a number of intermediate steps and the specialist and the leader roles introduced early. Steps 1 to 4 (MPG 2) would be skill-based, whereas steps 5 to 7 (MPG 4) would be competitive with limited posts. The career path would meet the standards currently being developed by the British Computing Society. With increasing use of "a" level recruits instead of graduates, training and on-the-job experience leading to certification would attract candidates. Despite strong union support, management was cautious in its implementation.

"Some of the people who left did not want to become a project manager." Organisational Planning Manager, ISDM

"The (technical) career path has been looked at over a number of years but never really got off the ground." Personnel Manager, ISD

## **EARLY RETIREMENT & REDUNDANCIES**

The culture of lifetime employment required controlled recruitment supplemented by voluntary retirements and redundancies to exit surplus employees. Dismissal for poor performance was difficult in the unionised context, and managers avoided the time-consuming process.

Early retirement was used to gradually downsize and reshape the senior management group in the 1980s. With Districtisation, MPGs expressing the desire to retire early were exited, but no targeting took place. This informal process was subsequently formalised by declaring surpluses.



Sovereign included a separation package for 40-50 year old managers considered poor performers within the new business culture. The appraisal system proved to be inadequate to guide decisions on leavers and stayers. Some survivors received an early signal, though many of the surviving managers continued to suffer from uncertainty.

In November 1991, a new voluntary scheme was announced, targeting all levels of the organisation, and particularly employees within the unionised ranks of WN where modernisation of the network was completed. This involved pension enhancements and several months of pensionable pay offered to surplus groups (40 years of age and over) within each unit. Counselling and support services were available. Those persons wishing to continue their employment were offered "personal rights" to their normal pay for four years.

## **CONCLUSION: HRM & SKILL SUPPLY PATTERNS**

In the 1980s, the HRM context of centralised personnel and civil service lifetime employment supported a traditional approach to skills supply: competitive national recruitment for entry positions and internal competitions, and ample training and career progression on the basis of seniority. Within R&D there was the additional influence of the technology life cycle; individuals made their careers in parallel development to a new technology.

By the mid 1980s the new mandate of senior management and the gradual downsizing and reshaping of their skillbase impacted on R&D. Short-term commercial projects grew in importance and the interests of the researcher became secondary. A weak union and a positive business sensitivity among the new recruits facilitated the transformation.

The HRM context was modified dramatically with Sovereign. Personnel became more efficient through increased centralisation and improved systems, and more skills-oriented with the activity of the PPB and the expert support offered to line managers within the Divisions. Within R&D, line managers approved of Vaughn Young who strongly supported flexible compensation and recruitment practices to address critical skill requirements. On the negative side, his personnel organisation lost some of its control over graduate recruitment, and training became a shared responsibility.

Post-Sovereign, employee dissatisfaction was addressed by improving career planning and career paths with some alignment with external professional bodies. Locating career development responsibilities with R&D section managers has created the potential of integrating skill issues ( mixing, building, and adjusting specific and transferable skills) across projects. The desire to improve performance by polarising technical and managerial work, and the delinking of technology life cycles and individual careers, led to an improved technical career path which received little enthusiasm from professionals and managers.

## **INTENTIONAL SKILL SUPPLY PATTERNS**

### **WORKFORCE PLANNING IN BT**

Headcount and budget controls operated throughout the 1980s in a manner similar to the civil service. Manpower planning was driven by the annual pay budget which was based on the number of people at each grade, and the average pay rates adjusted for London weighting and other allowances. Number of employees was linked to the expected turnover (employees per £ million) which

for a monopoly was one of steady growth. The non-pay budget covered agency and casual employees.

"The real issue was how many people and how much money am I allowed to spend, and adjusting the workforce to meet that. It was budget driven." Head of Personnel Services

Within districts, manpower planning suffered because of low expertise and the general belief that anyone could be a personnel planner. Headcount and budget controls were exercised but were focused on grades (ie., job classifications) instead of particular skills.

With Sovereign, a downsizing target was set for the middle management group based primarily on financial criteria (decreasing the pay budget), and with only a vague link to the proposed structure. Over-manning was widely perceived to be the case. A release scheme was launched by corporate Group Organisation (Unit); older employees and poor performers were targeted with the participation of line management. A second round was launched for surplus managers after people were positioned in the new structure. In all, some 7000 managers exited.

Recruitment was tightly controlled between 1990 and 1993, with priority given to managers with commercial experience and graduates. In 1992-93, 258 graduates were recruited principally for R&D. For the first six months of Sovereign, movement within the firm was limited to absorbing redeployed persons.

In 1991-92, operators, caterers and engineering technicians were the focus of downsizing. The controlling role had shifted into Group Personnel under the Manager of Personnel Strategy. Again, ad hoc targets were set by asking slightly more than the expected wastage based on a study of age and length of service



profiles. In the case of unionised engineering, significant cuts (6,000 in WN) took place in 1992. Workforce planning took a back seat to investment schedules for modernisation in the 1980s. The end result was significant over-manning.

Post Sovereign, the new PPB and divisional personnel managers were modifying the **meaning of workforce planning** towards a framework where BT skills are understood, defined, monitored, selected, and developed as part of the business planning cycle. Downsizing the organisation was an on-going concern, but shaping the skillbase was considered important for the long-term success of the organisation. The identification of core management skills and the introduction of a manpower planning system (with training for planners) was part of this new approach.

## **WORKFORCE PLANNING WITHIN R&D**

Headcounts in R&D were controlled as elsewhere in BT by multiple criteria. First, the level of business activity would establish the total R&D budget and headcount. Second, demand for certain skills would guide the finer adjustment in numbers, with recruitment of the new skills required. Senior management would re-allocate resources between research divisions. Once the headcount was finalised, the task of the divisional manager was to ensure sufficient income to break even and cover the manpower costs.

Workforce Planning Within a Research Division. The business plan acted as the framework for HR considerations. With a push for ISO accreditation, HR resources were allocated to this purpose. With customer requirements in mind, an assessment was made of possibilities for technical and career development, and the ability to absorb new recruits in need of intensive training. Detailed

project scoping took place through discussions among divisional head, section head, and project manager. Thus, within a directorate, there existed an informal and historical skill "data base" which became formalised only when project scoping took place. Skill information across directorates and BT were much weaker.

"Are we putting in place the right mechanism to deliver the right skillbase that the company needs in five year's time?...The numbering game is not sufficiently granular." Divisional Manager, NT

"We try out two types of matrices...a list of the projects and the key skills that are needed...Then we have the people matrix." Divisional Manager, ASD

Belfast & Glasgow. R&D anticipated a software labour shortage in the 1980s. In order to diminish reliance on the London market, a software unit was created in Belfast (1981) and later in Glasgow (1986). Both cities had quality software graduates who were not keen to move. In addition, their apprenticeship programs were given additional software content. Recruited with "o" levels, these future technicians added to the supply of software skills.

As of 1991, 300 were employed in Belfast and 100 in Glasgow. Software units were maintained in London, and others set up in Ipswich and Felixstowe (near Ipswich). The tight conditions of the mid 1980s relaxed thereafter with more recruitment of polytechnique graduates and later the growing recession.

Management of Retention. On-going leakage was not managed as a matter of policy and took place for a variety of reasons and circumstances. Employees were encouraged to meet divisional managers to discuss problems and issues. Line managers identified two significant outflows. First, a small number of

experienced and often exceptional researchers left because they wanted less bureaucracy and less commercial orientation. Second, young single researchers with some experience and critical technical skills became impatient and were lured by attractive packages. Both line and personnel management kept an open door in case the leavers chose to return, a policy operative throughout the 1980s. Retention efforts were more likely to focus on keeping a key person within a research team (intra-firm mobility) rather than addressing their possible departure from the firm. Low levels of turnover comparable with the industry reassured managers that there was no significant problem. In contrast, line managers in growth areas made consistent efforts to control retention after recruitment to meet growth targets.

"It's not necessarily getting the number down from 5% to 0 %. It is actually controlling tightly those that you are losing and whether you are losing the right people or not." Divisional Manager, NT

TQM Platform for Graduate Retention Study (1990). Line managers in growth areas arranged for a study of graduate retention. The risk to future business performance and high avoidable replacement costs were considered "quality" issues. The results were based on a survey of 1000 recruits with less than 3 years service and 30 management interviews. Resignation rates Division-wide were found to be low: 3.7% for all grades, with the highest rate of 6.2% at Level 1 where most recent recruits are found (see Table 5.4). Whereas satisfaction was shown with the content, challenge and variety of their jobs, dissatisfaction was evident on most other HR areas including use of their skills to the full, feedback and recognition, and career development.

Over 25% of these new recruits said they were likely to leave the organisation within 2 years. A comparison of likely leavers and stayers indicated that the



**TABLE 5.4:**  
**RESIGNATION BY GRADE IN R&D (BT), APRIL 1990**

<b>Grade</b>	<b>Staff in Post (A)</b>	<b>Resignations (B)</b>	<b>Annual Resignation Rate (%) (B/A x 100)</b>
Level 1 (MPG1)	1454	90	6.2
Level 2 (MPG1)	985	20	2.0
Level 3 (MPG2)	464	3	0.6
Level 4 (MPG2)	139	1	0.7
SMG	55	1	1.8
All grades	3097	115	3.7

**Source:** BT R&D Quality Improvement Project Report July 1990

MPG Managerial and Professional Grade  
SMG Senior Management Grade

former were more likely to be young, single women, living in rented accommodation, and living in London.

Belfast and Glasgow were highly rated by the graduate recruits. These centres are relatively small, undergoing growth, and tap local labour markets. The study also highlighted that managers underestimated the spectrum of graduate concerns and their levels of dissatisfaction. This traditional manpower study led to broad improvements in orientation, training and career development for new recruits (1991). However, no discussion took place on influencing the mix of skills recruited for changing business requirements.

"The one thing I feel a little disappointed in is this whole thing of managing the skillbases and integrating the business....we should be operating more strategically to get the best out of our employees." Divisional Manager, NT

TQM Platform for Skill Interventions. A 1991 TQM exercise revealed that the Network Control Layer Group within NT suffered from isolated small groups with specialised but relatively inflexible skills reflecting the sub-systems worked on. Professionals wanted to broaden their experience and have opportunities to manage other people for career reasons.

On a pilot basis, the incoming work was assigned to a mixed group and the task identity was maintained. After six months, it was found that the software produced was very good and skill flexibility increased. However, MPG4s felt uncomfortable and lost while MPG2s enjoyed job enrichment.

A similar result was experienced in a support unit of ISD. In their case, the work reorganisation was prompted by Sovereign and productivity requirements.

Hybrid Managers in ISD. With Sovereign, ISD created the position of Organisational Planning Manager for strategic issues. Historically anchored in analyst roles, the directorate became interested in "hybrid" managers with an awareness of business as well as computing. Technical retraining for skill currency would be guided by planning in architectural platforms and other technology. Unfortunately, the existing workforce planning system was considered inadequate to the task. Harder still was the process for developing appropriate managers. A cautious approach was adopted with no quick changes in recruitment or promotions.

"If you have not really got an idea of the sort of person you want and you go look for someone externally, you can bring in lots of problems." ISD Organisational Planning Manager

## **CONCLUSION: SKILLS PLANNING AS TOP-DOWN & BOTTOM-UP**

Workforce planning within BT was driven by financial and cost considerations. It was isolated from the resizing and reshaping of senior management (1984-1991) which was controlled by a small group of top managers. With Sovereign, it has played an important role in the downsizing of middle management and other groups. Skill issues were given secondary attention, but the new PPB line-oriented personnel managers have raised skill awareness within the personnel organisation.

Within R&D, skills planning was a bottom-up process within the constraint of headcount controls. The increasing commercial orientation led to management roles with higher skill awareness and with more efforts to increase skill utilisation. TQM did provide a useful platform for local skill interventions. In the case of graduate retention, the effect expanded throughout R&D. Sovereign



encouraged managers to improve productivity and customer service, and thereby increased the attention to work organisation and the packaging of skills.

Belfast and Glasgow (early 1980s) were exceptions in that they were prompted by critical skill shortages and expectations of continued shortages. These software centres were intentionally created by senior management within R&D as part of their strategic plans.

## **HARD & SOFT BENEFITS**

### **HARD BENEFITS**

Important changes in hard benefits around the personal contract took place for senior levels of management, in keeping with the new private sector orientation of the organisation. Less significant changes in the same direction took place for other managers and professional.

#### **(1) Base Salary**

Negotiated by corporate office, base salary was very important for professionals and lower managers, and was in the upper quartile with other large firms. This component was of moderate importance for contract managers and not negotiated; their total package of hard benefits was considered average. Centralised negotiations took place for professionals.

BT has great difficulty competing with small software houses and new telecommunication firms willing to pay top salaries in areas of skill shortages,

especially for young experienced professionals. Recently within R&D, some ad hoc salary increases (up to £8-10,000) have been given to key staff in response to poaching fears. When recruiting critical skills, R&D can now match offers but leading offers continue to be given on a contract basis.

Base Salary for Graduates. Year 1 and 2 are on a separate pay scale which is adjusted to mid-point between that scale and the regular scale after year 1 of employment. For the top 25% of performers, they are placed on the regular pay scale after 18 months, 6 months before schedule.

## **(2) Benefits**

Medical and health insurance, and an index-linked pension were offered. No noteworthy changes took place in the 1980s except for personal contractors who now have a company car, an expense account (American Express), two lines installed free in their home with a call allowance.

From April 1 1983, a separate pension fund was created out of the existing state scheme. Pension contributions were made by both employer and employee. Managers saw pensions as locking them into the firm because of the substantial penalty for leaving early, relaxed only for targeted release schemes. Experienced mobile managers joining BT viewed the pension unfavourably as it did not address their career pattern.

## **(3) Incentives**

A broader spectrum of incentives have appeared over the years. Line managers expressed satisfaction that they now have several ways of rewarding performance

and significant contributions. A bonus of up to £500 can be given for outstanding contribution; each divisional manager has a bonus budget. In addition, personal contractors may receive a bonus of 0 to 20% of their salary on the basis of performance, with a few receiving up to 35%. In 1991 an "encouragement" payment was given to graduate recruits to match that offered by competitors.

Suggestion schemes with rewards had been operating in BT-UK for some time, but lacked structure, consistency, and breadth. In 1987 the New Ideas Scheme was revitalised in conjunction with TQM and received board support. Adopted ideas led to an award of 5% of one year's savings up to £25,000. Ideas that were adopted but without savings received an encouragement award. Between May 1988 and 1991, more than 20,000 suggestions were submitted, 20% of which were implemented.

With privatisation (1985), the firm established two employee share schemes, the first (Employee Sharesave Scheme) savings related and the second (Share Option Scheme) involved purchase options for senior managers. Senior management also introduced the Employee Share Ownership Scheme, a periodic distribution of shares to employees but held in trust. Top management used the shares as a reward for a profitable year and as a punishment (no shares) for strike action (1986).

Employees were not enthusiastic about profit-sharing which represented a small annual reward (£200). However, the emphasis on equal treatment added an attractive element, and the sharing or withholding of profits had symbolic value. Adding a commercial flavour to the compensation packages have made employees more conscious of business realities.



Issue of Individual & Team Bonuses. Sovereign encouraged team working within the matrix structure but insisted on individual accountability and rewards. Confronted with this familiar problem, R&D managers continued to seek ways of reconciling the apparent contradiction. The timing of the bonus was viewed as very important; immediately after the work done was ideal, not after the yearly appraisal as was the practice.

"As we move towards rewarding people as projects get done, we would be more inclined to reward a team." Organisational Planning Manager, ISD

"I have had a problem with BT's approach to bonuses. It was largely individual based.... Some teams have actually pooled the individual bonuses." Divisional Manager, NT

#### (4) Pay Policies

Pay policies were adjusted mostly for personal contracts: greater risk sharing, consistency in relation to performance, higher pay secrecy, longer-term orientation with shares, and shorter-term orientation with appraisals according to goals. For unionised staff, the most significant change was the introduction of performance related increments.

Personal Contracts. With the approach of privatisation (1982-83), personal contracts were introduced for 200 senior managers, making their terms and conditions of service more comparable with those offered by the private sector. External recruitment of skilled executives was facilitated. Within Inland Division, the union also agreed to amalgamate most middle managers into one managerial and professional structure, removing traditional hierarchical boundaries and improving selection and appointment arrangements.

Personal contracts were extended to the top 1000 managers in 1983 and another 4500 in 1988 despite union resistance. In 1991, it was extended to 1300 account managers and sales people. It was believed that senior management was aiming to impose personal contracts on all middle managers. Periodically renewed, these contracts included PRP and a large bonus component, in contrast with the tradition of seniority and salary according to hierarchical position. Employees have very little negotiation power unless they have skills that are currently in great demand. Though employees compare notes, there is low visibility and some secrecy. Contract managers expressed general satisfaction with the scheme and the levels of compensation. Most MPGs favoured an extension to their levels.

"It (personal contract) is part of a progressive move towards marginalising and perhaps eliminating the Society of Telecom Executives." Corporate Personnel Strategy Senior Manager

Pay for Performance. Introduced in the late 1980s, PRP has been accepted in principle. Many managers believed that the PRP increment (in practice 1-3% averaging 1% of salary bill) was too small to influence performance, and has given rise to cynicism. Senior managers showed more optimism, believing in a cumulative effect. The management guideline suggested that thirty percent of employees receive some increase. Managers were not worried because of their belief that professionals were driven by the challenging work and their desire to achieve.

"Over time we can use the (PRP) flexibility we have within the pay structure to position people appropriately." Divisional Manager, NT

"I think it (PRP) is a waste of time. The budget for PRP is 1%, it is rubbish in my view." Division Manager, ASD



## **STRATEGIC USE OF HARD BENEFITS**

Market-sensitive compensation always has been central for the recruitment and retention of BT people. In the 1970s, internal consistency of salaries and standard benefits was very high because of the dominance of unions and the civil service egalitarian influence. The 1980s witnessed the introduction of personal contracts and performance-related pay for a growing number of managers. Base salary decreased in importance while benefits and incentives increased. Compensation became a personal issue focused mostly on the short term. This private sector package permitted the external recruitment of experienced managers and professionals. These critical recruits would be retained so long as opportunities for challenging work existed and their contribution was financially recognised. They felt, however, uncomfortable with the pension plan which rewarded long tenure and penalised early departures. While some long-tenured BT people welcomed the changes, others found it unpalatable and volunteered (or were prompted) for the early release schemes.

The bulk of the unionised staff were only slightly affected by these changes. They experienced some increase in incentives and a little risk through profit sharing. Pay for performance was introduced but it accounted for only 1-2% of the annual pay increase. Within R&D, personal contracts were viewed as attractive and a way of obtaining recognition for their contributions. However, there was some concern about rewarding individuals and ignoring the importance of the group effort. Management was pleased that it could offer "secret" salary adjustments to keep critical skills. Not diminishing the importance of hard benefits, those interviewed were unanimous that the package was of secondary importance to professionals driven by challenging work and skill development and use.



The above changes helped to shift the culture towards a focus on the new competitive environment and the organisational and personal changes required to operate within it. Retention of good performers and exiting of poor performers was considered desirable, and was pursued among the senior and middle managers to a greater degree with Sovereign. This was not the case for other employees protected by their unions.

## **SOFT BENEFITS**

BT introduced goal-oriented performance for managers and professionals, and promoted a private sector approach to business. Several soft benefits were modified significantly for this purpose: challenging work, employment security, and employee contributions. Other significant changes took place to improve morale and create commitment to the emerging organisation: employee involvement, formal listening/sensing, and career development.

Teleworking. Some minor changes took place as part of modifying business practices. Teleworking was introduced within R&D in the late 1980s to retain software female professionals with growing family responsibilities, with the idea of reintegrating the person at a later date. With most people opting for part-time work, arrangements ranged from simply modifying the days and hours of the work week to teleworking from home. Explicitly targeting retention of proven skills, teleworking was offered at the discretion of the line manager.

"If they (professionals) are good, if the skills are the ones we want to retain, then we try to come to some arrangement (teleworking)"  
Personnel Manager, NT

Enhanced informal listening/sensing by management took place as part of the heightened importance of skills for the attainment of high performance goals.

Where scarce skills were concerned, middle managers wanted to know their people better to ensure retention.

Improving Company Image. Management also attempted to improve company image with limited success. With the privatisation of BT, criticism by both the public and OFTEL have been sustained. Many employees complained that BT internal communications over-emphasized the positive and lagged behind the media. The deteriorating company image has had some impact on morale especially on younger individuals wanting a publicly responsible employer.

Modifying Challenging Work. Traditionally BT has demanded high performance of its professionals and managers, and has given them challenging work. With the introduction of personal contracts, thorough financial management systems, and a growing market orientation, management performance has become tied to specific goals and business requirements. In turn, performance of professionals and technical people have been influenced in this direction. In R&D there was a decrease in autonomy of researchers in setting the research agenda, shorter development cycles, and more specialised management and technical roles. Some tenured BT people found these changes unappealing; others have adapted readily, particularly the younger employees. The latter was reported by managers and confirmed through interviews of younger professionals. New recruits fit in easily, but had concerns about too few opportunities to learn new skills. In the end, "challenge" depends on individual preferences and willingness to adapt.

All agreed that the single most important retention mechanism was challenging work, but the focus lay with performance. Most departures were transfers within BT for promotion and responsibility, and opportunities to expand their skills. A



few notable researchers were lost recently because of their desire to publish, research widely, and have less bureaucracy. Some chose to accept a position at a university with lower pay. Their continued recruitment was seen as beneficial for bringing in fresh ideas and first class talent, and for their role as "hero" and "academic mentor".

"Unless a (software) person feels good, they can choose to be quite unproductive....You have to make sure that the environment is there to enable them to perform." Divisional Manager, NT

Redefining Employment Security. Since Sovereign, senior management has repeated many times that employment security could no longer be assumed. Early exiting of people was expected for several years. Senior management was intent on creating a flexible workforce with the ability to grow some areas quickly (eg., sales & marketing, network management) and shrink others quickly (eg., technicians, caterers). It wanted to foster a new mentality which placed business priorities first. High uncertainty and low morale was created in the entire organisation.

Recent experienced recruits (managers and professionals) had lower expectations of employment security and were confident of finding employment in the external labour markets. A new definition of job security applies: time enough to make career progress or make ready for a career move. In the case of MPGs, 2-3 years was sufficient; for higher grades, 4-5 years.

Recognising Employee Contributions. Traditionally line managers were expected to recognise individual contributions in the yearly appraisal exercise. With New Ideas, and significant bonuses for personal contractors, opportunities existed to link financial rewards with public recognition, a combination highly valued by employees. Some managers have done so with success and sensitivity to



individual and group contributions. They viewed this as important for performance and retention. With no management system as such, the use of public recognition remained patchy and considerable dissatisfaction was documented in the employee survey. Head Office responded by offering a new reward scheme (1992) whereby small financial rewards (£25) could be given to an employee immediately after a job completed.

Individuals also saw promotional steps as public recognition. The fact that a promotion is accompanied by a financial reward reinforced the idea that the individual's contribution was significant. The mutual reinforcement of soft and hard benefits was clearly at play. Asking the researcher to give the demonstration to customers and presenting at an international conference also meant recognition.

"Inevitably people talk about bonuses. They are very proud of it. I've done a good job, I am the best and this proves it." Technical Group Leader 1, NT

Improving Employee Involvement. With privatisation, the board was committed to increasing involvement of employees in the new BT. Direct briefings by managers, monthly inhouse newspaper, information telephone service, and letters from the chairman were used for this purpose. Sir George Jefferson used the personal written message to staff emphasising the new attitudes and ways of working. Ian Vallance continued the practice of formal communications with his people. Despite these communication efforts, many employees complained of the lack of balance in the information received.

"We're not getting a balanced (press) view of things. Sometimes BT tries too hard to be positive." MPG2, Support Systems, ISD

Improved communications did not stop the periodic speculation of relocations and redundancies fuelled by management statements. Individuals with outside experience were inclined to anticipate and job search. Sometimes BT lost people with the customer-orientation that it was trying to foster.

"About every two years, we get threatened with relocation...It is a real shame, we lost some excellent people in this last round...and we just moved within London." Manager, Support Systems, ISD

Improving Formal Listening/Sensing. In the past, sounding out the employee took place during the annual performance review and during individual and group work meetings. Recently, the implementation of the one-year career plan gave managers an opportunity to raise sundry topics in a non-threatening setting. In 1990-91, BT introduced an organisation-wide attitude (Care) survey with a public commitment to listen, explain and change. Management was keen to gauge the effectiveness of their programmes (e.g., TQM) and employee commitment to the new organisation. Topics covered included use of skills, recognition, job satisfaction, training, promotions, appraisals, relationship with manager, earnings and benefits, and security of employment. R&D adopted a systematic follow-up. The results indicated that people felt that career development (skills development and promotions) within the firm was poor. These results helped to persuade management of the importance of improving this area. Results also highlighted relatively low security of employment and pessimism.

Improving Career Development. Since Sovereign (1991), there has been an organisation-wide effort to rejuvenate career development which had suffered setbacks in the 1980s because of multiple reorganisations. A concerted effort has taken place to install a robust, enduring and standardised approach to career

management including a one year personal development plan. In order to remedy the low morale caused by the exiting of many colleagues and the continuing uncertainty maintained by senior management, new career ladders were being devised in engineering, marketing and computing. The focus was on morale and persuading BT survivors of a future within the new structure.

With sustained external recruitment in the 1980s, BT now had a significant number of senior and middle managers developed in the private sector. Attitudinal and style differences existed between these managers and those bred within BT. The "outside" managers were comfortable with a career which spans a number of organisations and do not feel wedded to BT. One would expect higher turnover among them. Selective exiting of managers who cling to the old ways has taken place and planned exiting of more managers was approved by the new chief executive (Michael Hephher). Coupled with continuing external recruitment, it has achieved a critical size of new style managers, and suggests that a private sector management culture will win out, characterised by higher levels of turnover.

Within R&D, projected recruitment problems in the 1990s led to line management interest in improving retention of new graduates. The 1990 TQM study was followed by improved induction and early training and career development activities. This career development focus was provoked by Sovereign, not explicitly planned. Previously brought together as a group for one day of induction, and thereafter left in the research divisions, the recruits would now be treated as a peer group, given an initial day of induction, followed by visits to operational sites (e.g., exchange), and some early training and development activities. The new programme has been introduced throughout



R&D including Belfast and Glasgow. A similar programme has been launched by WN Division.

Though many changes were made to career management, some areas continued to be neglected, such as the high potential schemes which lacked consistency, visibility and follow-up. While immediate managers took measures to develop and retain their best, their career development was not tied to the wider corporate needs.

## **STRATEGIC USE OF SOFT BENEFITS**

BT has tried to strengthen most of the above soft benefits to enhance performance directly (employee contribution, and informal listening), or indirectly through improving morale (employee involvement, formal listening, career development, and company image). On the other hand, offering employment security which had been tied to the value of BT as a good employer, has definitely deteriorated. Challenging work to encourage high performance has degraded as well in some areas; the work environment remained positive but suffered from the climate of low morale.

Managers viewed some of the soft benefits as retention mechanisms: challenging work, employment security, teleworking, employee recognition, and informal listening, all of which were being modified for business, not care, requirements. Retention awareness and activities of lower levels of management already was well established, but very local in perspective.

Within R&D, challenging work was more closely aligned to business requirements and not everyone was able to adapt to the new performance expectations. Introducing teleworking and improving initial career development for graduates were tied to skill retention goals. Recent improvements in career development followed from changes in work design and the desire to improve morale. Recognition of employee contributions and their involvement also targeted morale.

### **CONCLUSION: COMBINING HARD & SOFT BENEFITS**

Changes in hard benefits were meant to produce changes in performance and facilitate the recruitment of absent skills to create this desired performance. Retention was given little attention. On the other hand, changes in soft benefits served several purposes. Again heightening performance dominated, but teleworking served the retention purpose while other benefits targeted morale which could influence both retention and performance.

There was a shift away from linking salary increases to promotions and towards linking financial rewards to performance recognition. The new combination of hard and soft benefits creates a strong and **selective retention** impact. Within R&D, improving recognition was given serious attention. Some managers were encouraging a **broader range of rewards**: working dinner with the wives, all none taxable; presenting quality awards (£200) and certificate on a hospitality event when the directors were present, or in a bi-yearly assembly of all departmental staff. The idea was to give both private and public rewards, and link bonus to recognition. One area of difficulty has been the individual bonus which conflicts with the basic group unit.

In order for this shift to be successful, employees have to alter their career concept away from vertical paths and towards horizontal paths emphasising performance, not the job per se. However, recent changes in career development reasserted vertical paths for professionals and lower management. Though not fully articulated, the push on career development and new career paths will help to maintain a **general retention** effect.

We conclude that management has been pursuing a performance strategy by adjusting the package of hard and soft benefits offered. Since Sovereign, greater attention has been given to critical skills for business success, and this has prompted personnel and line managers to introduce retention interventions for specific purposes (ad hoc salary increase to headoff poaching, teleworking for a leaver).

### **SUPPORTING BUSINESS STRATEGY WITH A SKILLS SUPPLY STRATEGY**

The business strategy thrusts impacted on the components of skills supply (see Table 5.5). The underlying question is whether the patterns of change represent a skills supply strategy.

Shifting the Management Style (1981) used most skill supply levers available with emphasis on external recruitment and personal contracts. Though career development was not impacted directly, the notion of career underwent redefinition with less emphasis on vertical promotions and more on recognition of performance tied to business requirements.



**TABLE 5.5**

**LINKING BUSINESS STRATEGY & SKILLS SUPPLY IN BT**

<u>Components of Skill Supply</u>	<u>Business Strategy</u>						
	<b>MS*</b>	<b>GL</b>	<b>MO</b>	<b>R&amp;D</b>	<b>DEC</b>	<b>TQM</b>	<b>SOV</b>
	1981	1981	1981	1981	1984	1985	1991
Initial Recruitment	X	X	X	X	X	X	
Initial T & D				X			X
Job Design	X	X	X	X	X	X	X
Perf. Appraisal	X					X	
Compensation	X					X	
Training	X	X	X	X	X	X	X
Career Develop.							X
Exiting	X		X	X	X		X

\*  
 MS: Management Style  
 GL: Globalisation  
 MO: Modernisation  
 R&D: Aligning R&D  
 DEC: Decentralisation and districtisation  
 TQM: Total Quality Management  
 SOV: Project Sovereign

Globalisation (1981) of BT services meant the creation of new jobs and the eventual recruitment of nationals in other countries. The pace of change has been very slow throughout the 1980s and few skill levers were applied.

Modernisation (1981) of the network created new jobs for the digital environment, and emphasised job redesign, redeployment and exiting of surplus people. Training to maximize skill levels was the traditional policy and was expanded to include the new technology and its applications. The new capability of the network prompted new ways of operating and job redesign. Though some downsizing was targeted throughout the 1980s and 1990s in response to efficiencies, this was suspended for two years in the late 1980s to accelerate the modernisation programme. Massive recruitment took place followed by renewed downsizing.

Aligning R&D (1981). Senior management had explicitly stated their intentions of realigning R&D, and supported the establishment of software centres in Belfast and Glasgow. Because R&D was involved at the earliest stages of introducing new technology and was the platform from which the modernisation programme was launched, it easily attracted the attention of senior management. Realignment was supported by several skill levers especially the recruitment of software skills, and secondarily retraining from hardware to software. Serious effort was made to access new sources of supply (Belfast and Glasgow). The local management gave sustained attention to the quality of the working environment and to career development to establish the new centres with retention given some consideration.

With the growing emphasis on project management around specific business needs, line management concern to retain talent has become widespread, but less

attention has been paid to career development. This gap was recently addressed with the new career paths in response to Sovereign, and the spread of the career development plan.

Total Quality Management (TQM) (1985) was accompanied by the recruitment of small numbers of experts to fill the new key positions of a TQM organisation. Training of all managers was attempted and management appraisals were linked to the Quality Plan in a general sense. Quality awards were introduced. This strategy aimed to introduce private sector elements into the management culture, that is, improving performance continuously and a customer focus. With Sovereign, the merger of TQM into the line functions implied some job redesign. Post-Sovereign, a second wave of TQM would involve training for all BT people.

Restructuring for Business Strategy. Some of the above strategic thrusts were supported by major restructuring. **Districtisation** (1984) increased decentralisation and gave the new management style a structure through which it could operate. The creation of relatively autonomous large business units required the recruitment of many business specialisms (marketing, sales, finance and accounting) and the broadening of upper middle managers to integrate all functions. Recruitment of experienced managers and professionals and fresh graduates in the specialisms was supported by massive training of existing BT people. The new flatter structure also meant exiting some senior and middle managers. The umbrella agreements with the unions allowed for local job redesign. Negotiations at the district level consumed much personnel time. This restructuring acted as a catalyst for the 1981 strategic thrusts of Management Style and Modernisation which had made limited progress.



More recently, **Sovereign** (1991) launched a dramatic restructuring and job redesign in the management ranks, a thorough job reassessment of all positions, and a significant downsizing exercise for middle managers. Training programmes in leadership and TQM were introduced. Improved induction and career development for the specialisms and management ranks followed thereafter to support the new structure and improve morale. As in Districtisation, this restructuring has acted as a catalyst for shifting the management style, and in addition, inculcating TQM. Sovereign may also galvanise the halting thrust of globalisation which made little headway in the 1980s.

In reviewing the above strategic thrusts, one notes that the pace of change starting in 1981 was slow. With privatisation and the creation of districts (late 1984), the pace accelerated. TQM (1985) also took a few years to become operative, and was confined to the management cadre. By the late 1980s these interventions had matured, and the next restructuring (**Sovereign**) activated rapid change in 1991. Both restructurings were accompanied by a flurry of adjustments in skill supply components. But were these changes coordinated and mutually reinforcing, that is, a deliberate strategy?

A strong case exists in favour of Management Style where a sustained programme was at work. New types of managers with new skills were desired to transform the management cadre. External recruitment of new skills and exiting of old skills was the cornerstone supported by other levers. Performance-related hard and soft benefits were introduced and maladaptive managers were exited. TQM for the management group was sustained over several years (1985-91) through a variety of skill supply levers. Both major structural changes (**Districtisation** and **Sovereign**) mobilised the new management style.

Aligning R&D also was supported by a long-term programme to modify the mix of skills with high reliance on external recruitment for professional skills, and work reorganisation and training for management style. Recent work organisation has targeted productivity of professionals.

## **INFLUENCE OF HRM CULTURE ON SKILL SUPPLY PATTERNS**

Within BT, five features of the HRM culture are noteworthy: civil service inheritance, unions, personnel management style, workforce planning, and top management.

Civil Service Inheritance had a mixed influence on attempts to change the skills supply. Because of its defence of employment security, BT has consistently maintained high standards of recruitment and training with ample resources allocated for these activities. Changes in focus and breadth could easily take place. On the other hand, this same inheritance resisted appraisals to specific goals and compensation linked to the business value of performance. Similarly it opposed promotions based heavily on performance. However it did indirectly support broadening of individuals by matching promotion-ready candidates with diverse job openings as they arose. Lastly it opposed exiting people on any grounds other than evident incompetence, and ensured that any early releases be done according to age and tenure and not performance or skill.

The Unions have had, in the opinion of this researcher, mostly a negative impact on skills management with the exception of supporting broad training. From their perspective, the BT leadership was attempting to undermine their influence and was attacking many of the long established values of unionism such as tenure. The 1980s remained a period of difficult labour relations with two strikes.



The unions have succeeded in slowing the pace of most of the changes. It has had less success within management ranks where the use of personal contracts has increased and where many managers are anxious to adopt the practice. Within R&D, the unions involved were not militant, reflecting the professional style of researchers.

Personnel Management Style has been, until recently, one of administration reflecting the civil service emphasis on fairness and formalisation. It has had mixed impact on the skill supply changes, lacking in flexibility and failing to explore and institute novel solutions. Though its recruitment and career development policies and practices were sound, even they lacked flexibility when confronted with rapidly changing labour markets and career paths that became inoperative with repeated restructuring. To be fair, some flexibility emerged within the districts when personnel directors reported to the district managers. Similarly a division like R&D had developed its own personnel organisation giving some support to line managers. It was able to capitalise on the Sovereign push and introduced new flexibility in addressing skill issues. Under the leadership of Vaughn Young, the HR strategists became supportive and proactive advisors to line management and were active participants at two levels of middle management. Changes in recruitment, training and compensation have taken place in a timely manner to meet skill concerns.

Workforce Planning has had little influence except for initial recruitment and exiting. It was focussed very much on numbers and grades and was practiced throughout the organisation and at the various headquarters. In general, the skill level of planners was poor and acquired on-the-job. Planning did however offer a background against which change agents could indicate more sophisticated ways of planning and managing skills. Within R&D, there was a



**slow adjustment of the skillbase.** Substantial recruitment of software skills took place in the second half of the decade, yet the proportion of hardware to software skills was 50/50 in 1991. Part of the problem resided in the business and workforce planning practices which were too "coarse" for skill decisions. The need to support existing hardware systems (e.g., System X) for the duration of their life span also encouraged slow adjustments

The arrival of **Sovereign** has helped to reorient both personnel management style and workforce planning towards business requirements and skill issues by formalising teamwork between line and personnel management. However in the short term, workforce planning continues to focus on numbers and grades to meet downsizing targets supporting financial targets.

Top Management has proved to be the dominant change agent, and did so by self-transformation through modifying the management style and radical restructuring. The process spanned the 1980s and into the 1990s. Within R&D the shift in management style created section managers with broad financial and HR responsibilities and with a keen interest in managing the skillbase. Locating HR responsibilities at the section level helps to offset the cohesiveness and longevity that tends to characterise the research groups. It remains to be seen to what extent section managers use the various HRM levers at their disposal to support their core business activities. Higher levels of R&D management also demonstrated an **awareness of the skillbase**, but as of late 1991, neither they nor personnel had a Division-wide strategy for creating and managing the appropriate skills mix.

In conclusion, the HRM culture of BT has been as much an obstacle as a solution to a skills supply strategy. Stated another way, the HRM culture needed

modifications before significant adjustments in skills supply could be made. After a decade of change, much remains to be accomplished. Sovereign does offer some promise, and has created a flurry of skill strategy impulses within the divisions (eg., WN protected scarce skill groups from downsizing), and some initial headquarter moves in this direction within the PPB. Compared to the rest of BT, the R&D Division had a less negative HRM culture, but nevertheless remained anchored in the wider BT culture.

## **CHAPTER 6. ROYAL SIGNALS & RADAR ESTABLISHMENT (RSRE)**

The Royal Signals & Radar Establishment (RSRE) case completes the data base of this thesis. This military lab underwent the same Thatcher revolution as BT (Chapter 5), but at a slower pace. The push on efficiency and customer service has culminated in several reforms.

### **OVERVIEW OF THE ORGANISATION<sup>1</sup>**

RSRE is a Ministry of Defence (MOD) establishment with its main sites in Great Malvern, south-west of Birmingham. RSRE advises MOD on a wide range of technology options and applications around the core technology of signal processing, assists in the procurement process, and undertakes strategic research in enabling technologies.

A dozen clients are involved, represented by the Defence Staff, the Procurement Executive, and the Chief Scientific Officer (see Figure 6.1). MOD work accounted for 90% of the £781 million turnover (1991-92 DRA Annual Report). Other customers include the Civil Aviation Authority and the Department of Trade & Industry (DTI). Minor customers include the U.S. Strategic Defence Initiative, the EEC programmes (ESPRIT), and some firms. With a 75%-25% split between intramural and extramural work, the latter takes place in industry, universities and institutes with RSRE awarding and supervising the contracts.

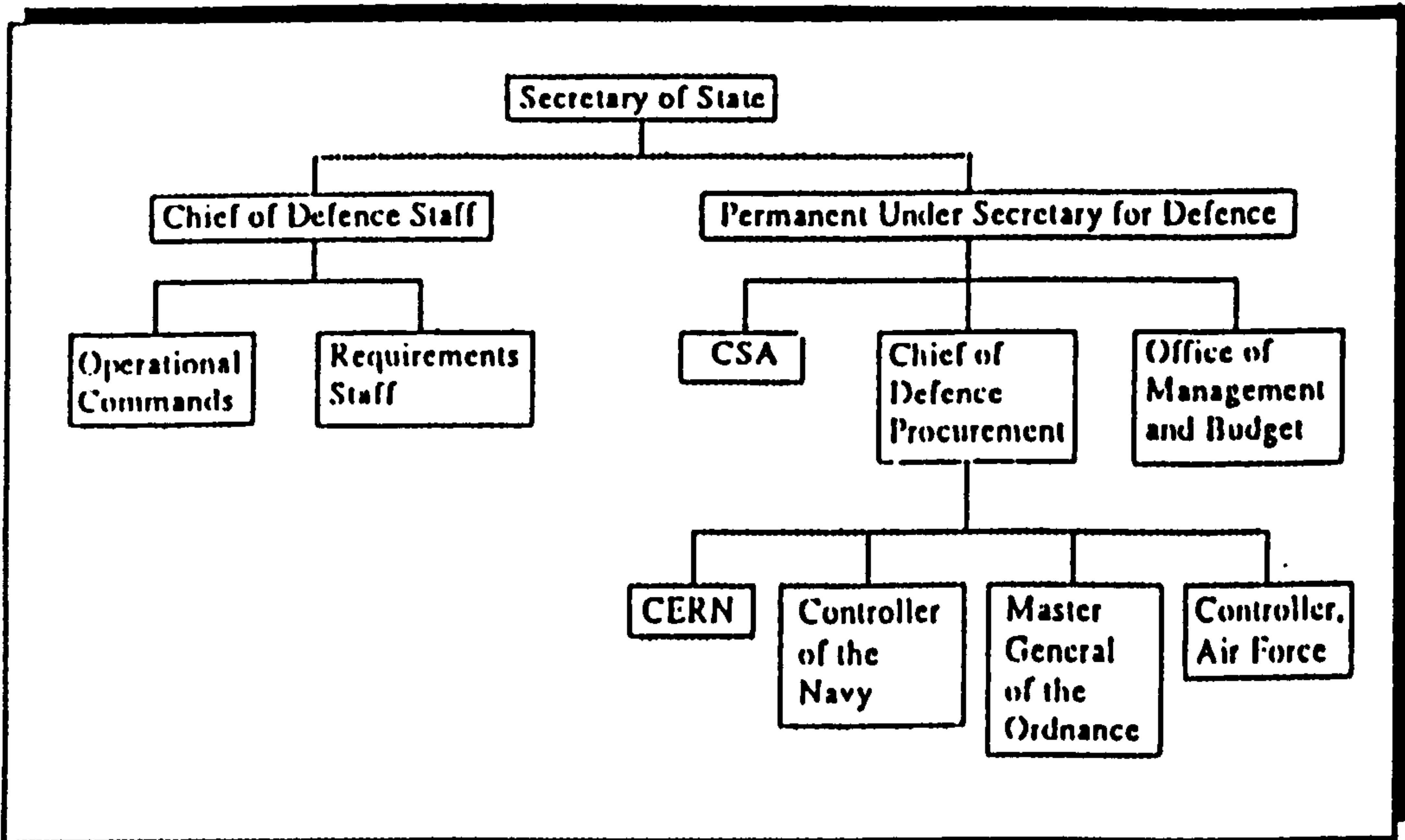
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<sup>1</sup>For national security reasons, detailed figures on workforce, projects and budgets are not available.

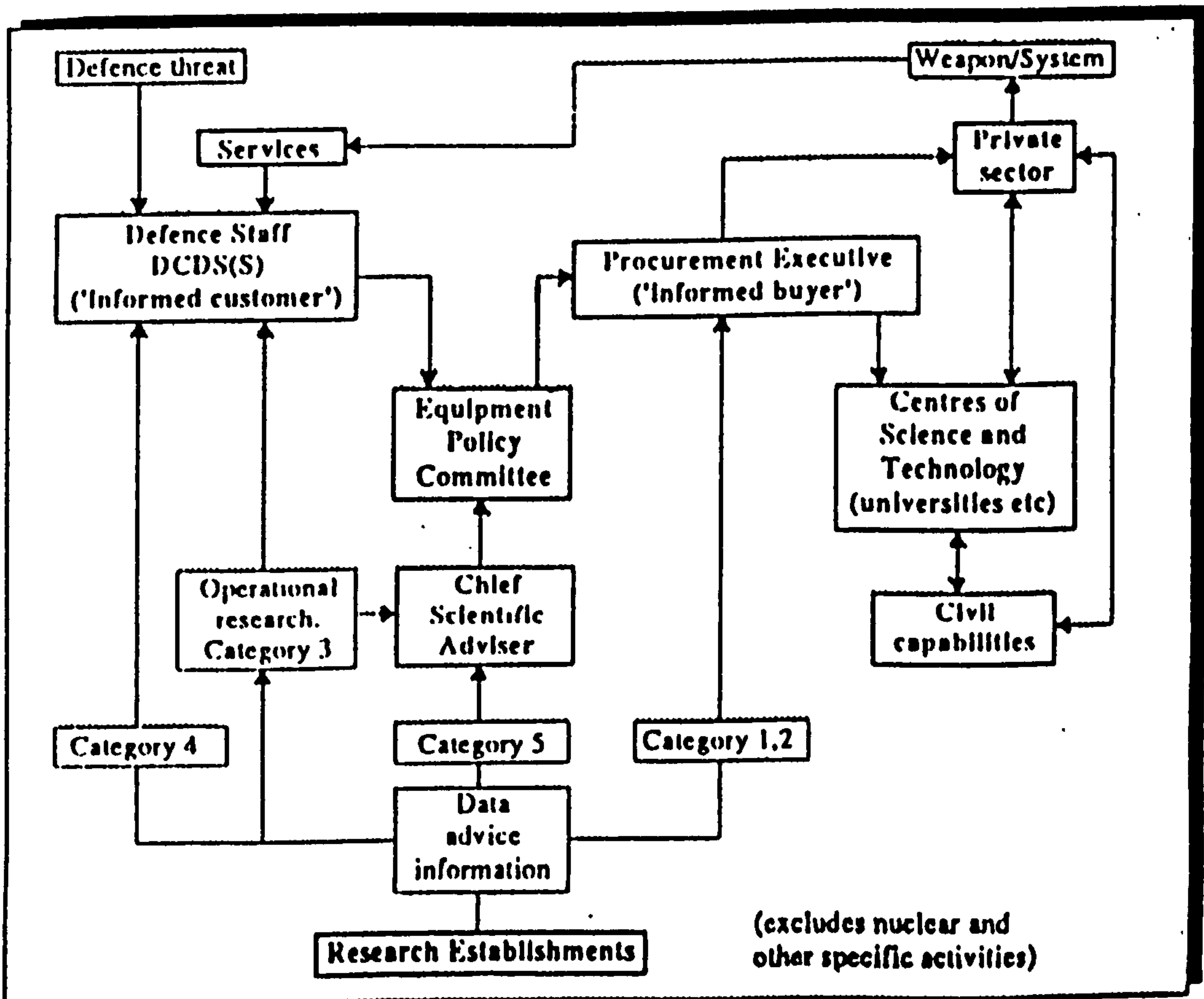


**FIGURE 6.1:**

**MINISTRY OF DEFENCE (MOD) STRUCTURE**



**Existing MOD decision paths**



Source: HMSO (1989), p 21-2

In April 1991, RSRE became the Electronics Division of the new executive Defence Research Agency (DRA). DRA had 12,000 employees (1500 in RSRE) with headquarters in Pyestock. Later that year, John Chisholm from the private sector was chosen as Chief Executive. Plans were made for asset and staff rationalisation, and total quality process and a customer satisfaction survey were introduced.

During the 1980s RSRE had Nigel Hughes as Managing Director. This career MOD scientist was supported between 1984-1989 by Steve Robinson as Director of Information Systems, an active scientist on secondment from the company Philips. When Hughes became interim Chief Executive of the DRA in 1990, Robinson replaced him as Managing Director.

## **HISTORY OF THE ORGANISATION & ITS ENVIRONMENT**

### **THATCHERISM**

The 1980s saw the arrival of the Thatcher ideology of reliance on market and quasi-market forces to discipline the Civil Service and obtain value for money. The conservative government diminished the power of the unions over labour markets through modifications of the Employment Act in 1980 and 1982 (Sisson 1989). In 1982 the government introduced the Financial Management Initiative giving senior civil servants more responsibility and authority. New management systems and budgeting systems were introduced to empower the "managers". Reductions in the size of the Civil Service were pursued: between 1979 and 1984, by 15%, and an additional 5% by 1987, with continued pressure since then.

In the first half of the 1980s, the level of military procurement increased by 15%, but staffing levels within both the Procurement Executive and the REs decreased by 15% (HMSO, 1989). In 1985, MOD introduced the Cardinal Point System which made use of general specifications and readily available technology. It consequently increased MOD's need for informed customer capability supplied by the REs.

That same year, MOD introduced the Savings and Enhancement Measures. The annual review was to redirect 10% of funds to new priorities. The mechanism quickly fell into disrepute because only small isolated parts of the research program were reviewed at a time. MOD became suspicious that the REs were protecting their vested interests to the detriment of MOD priorities.

In 1987, the government launched the Next Steps Program which proposed the creation of executive agencies focused on service delivery and a smaller manageable civil service (HMSO, 1988a). MOD announced its intention to merge the non-nuclear establishments into the DRA. Meanwhile, MOD came under attack by the Prime Minister's Efficiency Unit (HMSO, 1988b), and by the Advisory Council on Science and Technology (HMSO, 1989). The Council supported the view that the REs had lost some of their breadth of expertise through repeated rationalisation.

MOD responded by launching Package Management (PM) in 1989 to sharpen the customer-supplier relationship and introduce elements of competition. The main points include (1) a transparent link between each military requirement and the resources used within the RE to meet that requirement; (2) the creation of a Trading Fund where the REs compete with the civil sector for specific work; and (3) the creation of package managers within each establishment.



The above two thrusts (DRA and PM) impacted on the establishments in 1989-90, and complemented each other. DRA was vested in April 1991. Simulated trading was scheduled for 1992 with full trading in 1993. Meanwhile the government continued restructuring the civil service (HMSO,1990). By 1991 50 agencies were planned employing 200,000 of the 550,000 in the civil service.

The amplitude of the changes within the REs was increased by the 1990 MOD proposal of "Options for Change" which foresaw the reduction of the armed forces by 20% over a five year period, and by extension a reduction of the headcount of the future DRA from 12000 to 7000 in the same period. Where these reductions would take place remained unclear. In fact, the next few years would see minimal downsizing concentrated among the support staff (DRA Annual Report, 1991-92, 1992-93).

## **TECHNOLOGY**

The 1980s witnessed a rapid global expansion in knowledge and technology, and the maturing of computing into a science. Equipment with a high technology component became progressively more expensive, thus putting pressure on the workforce budget. The 1980s also saw the growing importance of the EEC as an economic and political force. It supported European R&D collaboration and a European market in armaments. The REs became MOD representatives in these collaborative cost-sharing ventures.

The second half of the 1980s saw some growth in RSRE because of Command & Control technology. Both the Falklands and Gulf Wars confirmed the importance of surveillance, intelligence, planning scenarios, and command and

control for precision warfare and few casualties. This technology also permitted the prime minister to exercise a measure of real-time control.

## **CONCLUSION: BUSINESS IMPERATIVES & HRM STRATEGY**

The new environment of RSRE imposed customer orientation and accountability. With a thin and expert skillbase, RSRE would have to modify its research programme more frequently to remain relevant and competitive. Customer responsiveness would require adjusting the skillbase, made difficult by pressures for downsizing. This new way of doing business would require multiple organisational changes including modifying the traditional scientific culture.

## **BUSINESS STRATEGY**

### **RESEARCH EXCELLENCE**

In 1978, RSRE was created out of the merger of Telecommunications, Radar Research & Development and other small establishments. RSRE benefited by a dramatic increase in the concentration of expertise within its organisational boundary. The 1979 Strathcona (the then Minister of Defence Procurement) Report set a new orientation. All engineering development would be done by industry, as well as short-term research whenever practicable. The REs were to concentrate on longer term applied and strategic research, and the support of the Procurement Executive of MOD.

Throughout the 1980s, all REs reported to the Controller Establishments, Research and Nuclear (CERN) within the MOD Procurement Executive (see Figure 6.1). As a dedicated service organisation, RSRE was not free to set its own

business strategy. However, it did achieve considerable freedom in setting the research agenda because of expert power and its overview of the research process. RSRE's independence from MOD was strengthened through long-term costing within the civil service (i.e., predictable funding) and the global budget attributed to it.

With the rapid changes in global technology, the mix of research activities within RSRE was adjusted over the 1980s. Management discarded less promising avenues and supported new ones. By tapping into the global community of scientists through conferences and collaboration with other labs (military, civil, and university), RSRE kept abreast of the current developments. With the explosion of computing and telecommunications in the 1980s, RSRE relied considerably on the civil sector to complement its own modest programme, and came to play a project management role in EEC collaborations. Thanks to its national and international standing, RSRE easily obtained these contracts. In this manner, MOD had access to expensive technology despite its constrained budget.

The gradual adjustment of the technology mix took place during the 1978-85 rationalisation period. RSRE built on its strengths by reinforcing programmes already in operation. New resources became available as of 1986 for Command & Control, but RSRE was salary disadvantaged in its competition with the civil sector for scarce skills. The growing use of systems in all areas of RSRE research compounded the problem.

Adjustments to the technology mix was not an organisation-wide concern. A few key players were concerned with the pull-through of research output from the long-term investigations to the application stage. Research programmes were



determined internally by the scientists and their managers rather than being customer-led. Effectiveness, not efficiency, was the main criterion of success.

"MOD always wanted breadth from RSRE to construct vast electronic systems based on novel and up-to-date platform devices. This will always be the case." Technology Director

## MANAGING MOD

MOD had its own modest scientific staff who relied heavily on RSRE and were often resourced from the REs. Because of the fragmented project management system operating within MOD, RSRE management had a privileged perspective overlooking the entire research process from emerging technologies (horizon of 10+ years) to equipment procurement based on competing civil contracts. They were persuasive in defending their preferred research agenda and in justifying their rate of progress.

Following the allocation of a global budget to meet specified military research requirements, the funds were allocated within RSRE on a flexible basis according to management commitments and research opportunities which emerged during the year. With the emphasis on spending the year's allocation, those areas spending rapidly were able to absorb any unspent funds in other areas. Care was also taken to supplement the modest strategic research budgets with some medium-term funds to pursue a promising avenue. The reverse occasionally took place in order to demonstrate a promising application.

The MOD military were irritated when RSRE refused to adjust its research programme in response to changing MOD priorities unless additional funds were made available. This antagonism between the scientists and the military was

acute in the Applied Physics Department, and less so in the Information Systems Department where people tended to work more closely with the military on projects with shorter horizons and more evident applications. Despite the Savings Enhancement Measures of 1985, RSRE management was able to operate as usual by negotiating small parcels of the research programme at a time, and by making minor savings to the existing programme. The growing dissatisfaction in MOD and its shrinking budgets helped overcome the strong inertia to change in this ministry.

"In the past, it was exercised on a resourcing axis rather than a programme axis....People tended to do what we call salami slice, a little there, spread the research programme." ISSBU Superintendent A

"In the 1980s we experienced reorganisation of the (MOD) customer interface, moved from a loose coupling to a tight coupling." Package Manager B

## **PACKAGE MANAGEMENT (PM)**

In 1988, RSRE senior management understood that the ground rules were about to change, requiring a radical change in attitude. Customer orientation became the guiding value and locking-in the main customer the objective.

MOD generated a list of 80 military requirements (research and advice). Each request was now equated with specific and exclusive resources. The existing research activities of the REs were mapped onto the requirements with significant cuts planned for 1992. RSRE management complied and tried to gain their trust. Despite their concerns over the tendency for cutting enabling technologies, managers fully cooperated while making their views known. MOD management came to recognise the problem and agreed to three technology packages owned by senior MOD staff. Thus "soft" persuasion proved to be

effective, and would be required to persuade MOD decision-makers of the dangers of short-termism for the research process.

"The customer felt he wasn't getting a coherent picture...wanted a sort of one-stop shopping....The list of military functions or requirements was devised for this purpose." ISSBU Director

"If people think that they can judge a programme after five years, in many instances they would be wrong." Technology Director

"If there is micro management in PM it will not work...money is only good in big lumps." ADBU Director

PM removed the budget flexibility previously enjoyed and gave MOD sufficient information to control the research programme. RSRE's new strategy (1989-91), included full compliance with MOD's expectations and the rapid installation of a commercial accounting system. Package managers demonstrating MOD zeal, transparency and customer sensitivity were installed. The senior and middle management shaped a new organisation composed of business units (BUs), and energies were channelled into making it work while buffering lower levels of staff. Staffing levels were matched to assignments within each BU; this meant priority recruiting in BUs under strength.

"At the moment you must not appear to resist the customer and you must do his bidding." ADBU Director

"We're trying to establish a rapport with the customer which hopefully will mean that when we advise him to use DRA he will do so." Package Manager B

"I have taken the strain of writing the reports and doing the interacting myself...in the transition." ISSBU Superintendent B

"I have been buffering those below my level." MEBU PSO A



## **DRA & BUSINESS DEVELOPMENT**

RSRE attempted to influence the nature of the emerging DRA. The interim staffing created an opportunity. Under the leadership of Nigel Hughes at DRA (previously Managing Director of RSRE) and Steve Robinson at RSRE (previously Deputy Director of the Information Systems Dept., and now a member of the DRA board), a decentralised structure was implemented (April 1991). Opportunities to increase the scope of research were welcomed so long as MOD benefits were forthcoming. The BUs were challenged to create business strategies for internal and external customers.

"In the commercial area, we have 10% of our current business, and that is the bit we have got to grow." MEBU Director

"The BUs have a fundamental problem in that at first sight they have lost all autonomy....They have to work out an internal supplier strategy." Package Manager C

"We haven't worked out the ethos, our loyalty to RSRE as opposed to the BU." ISSBU Director

"We lack the private venture cushion, have only external customers and dominated by MOD." Business Development Manager

The framework document imposed policy from three areas: MOD, Treasury, and the Civil Service. It also provided for subsequent negotiations to empower DRA as much as feasible. RSRE wanted to include a business development component, and in a manner of speaking, return to its roots of serving both the civil and military markets. RSRE felt a great need to create new streams of revenue to replace the shrinking military budget and thus maintain its present size. A critical mass of scientists with sufficient breadth and depth of skills was thought essential for high quality science.

In the past, RSRE often turned down remunerative civil contracts because of budget constraints. The establishment ran on gross running costs (includes staff, stores, maintenance, travel, but not capital and extramural). Additional revenues could not translate into additional resources (eg., hiring additional staff, buying equipment). DRA has proposed net running costs with the ability to expand beyond the MOD budget. Treasury resisted this solution because of the objective to reduce the overall size of the public sector. Negotiations continued with Treasury. Experience in other Agencies has indicated the continuation of constraints in several areas (Dopson, 1993; Mellon, 1993).

## **CONCLUSION: BUSINESS STRATEGY & HRM IMPLICATIONS**

Increasing customer focus took on a structural dimension with the introduction of package management and agency status. The new structures would involve new work organisation for tighter project management, and new management roles with a general business perspective. The breadth and depth of the skillbase became an important issue. In order to serve and compete effectively, RSRE needed to maintain a critical mass of researchers. Downsizing was viewed as a threat to the skillbase.

## **RSRE AS AN ESTABLISHMENT**

### **ORGANISATIONAL STRUCTURE**

RSRE had a primarily functional structure with two large departments: Applied Physics and Information Systems. The former specialised in under-pinning technologies (materials, signal processing) and the latter in applications and

systems which in time included computing and telecommunications. Each department was composed of six area groups with each group having about five research divisions (30-40 employees per division). Support departments included Engineering & Services, and Administration. The Corporate Secretary was in charge of finance and personnel.

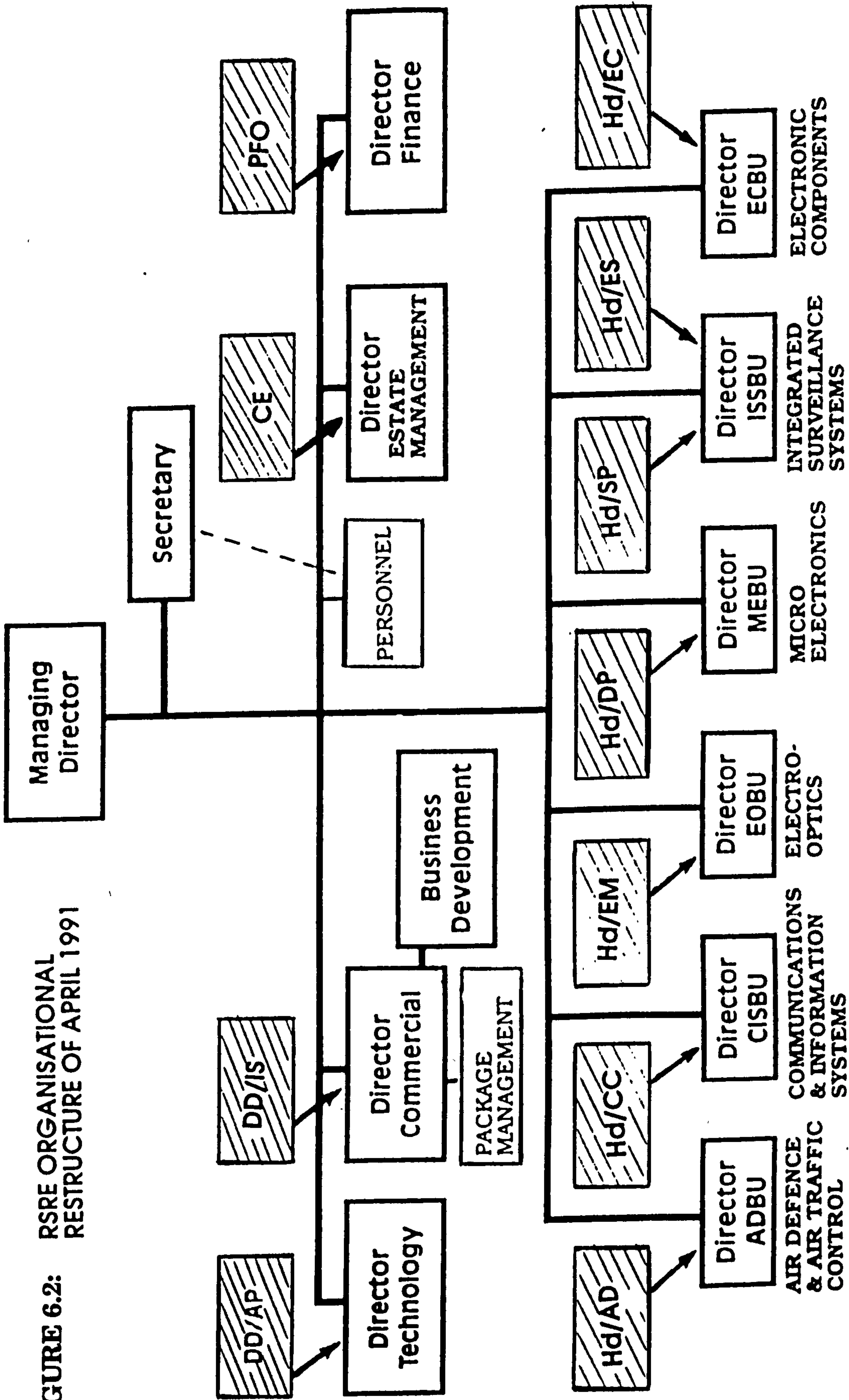
The departmental structure was notoriously poor for inter-department relations and resource sharing. Over the 1980s, this became more of a problem with the growing importance of systems in all areas of research. With PM, it also became important to demonstrate the relevance of technology research which could best be done through a demonstration or prototype.

The arrival of PM and DRA gave senior management within RSRE the motivation to restructure the organisation (1989). Planning took place throughout 1990 with the active participation of middle managers and became official in April 1991 (see Figure 6.2). The main innovation was the six BUs: Air Defence & Air Traffic Control (ADBU), Communications & Information Systems (CISBU), Electro-Optics (EOBU), Micro-Electronics (MEBU), Integrated Surveillance Systems (ISSBU), and Electronic Components (ECBU). Both ADBU and MEBU combined divisions from both of the old departments. Excess middle managers became either package managers or the management cell supporting the BU director. Other important elements included a Business Development Department for initiating and coordinating non-MOD business, and dedicated finance and personnel managers.

"Prior to the reorganisation, the two departments fought for resources. Now the Directors of Technology and Commercial take an RSRE view." Commercial Director



FIGURE 6.2: RSRE ORGANISATIONAL RESTRUCTURE OF APRIL 1991



Current Post  
 New Structure

"There was a degree of friendly rivalry between the two departments or factions....Now the key position for getting the work done is the BU director, whereas before it was more the responsibility of the deputy directors." Technology Director

In 1991 RSRE became the Electronics Division of the DRA, one of four divisions within a decentralised structure. The divisions coincided with the previous establishments which had little overlap in products and services, with the exception that RSRE supplied electronics support to the other REs.

## **SKILLS STRUCTURE**

Of the 1500 employees present in 1991, about 700 were scientists (Scientific Officers and more senior grades). Within the physics-oriented areas, PhDs were common. Within the systems-oriented areas, a variety of degrees were present including engineering and mathematics. Because of the requirement of national security, detailed information was not available.

## **WORK ORGANISATION**

A team of scientists with a Team Leader (usually a PSO) may have anywhere from 7 to 30 members divided into small groups working on specific problems. The Team Leader assigns tasks, monitors progress and coaches as required. Informal networks of scientists facilitate the sharing of information; the coffee room plays a very important role.

Individual Merit (IM) Scientists head their own small team focused on long-term research, but advise widely within their division. Often the IM may overview the whole team in association with the Team Leader in shared leadership.

Stable teams focus on a specific technology. Some turnover takes place through promotions and the spinning off of new groups and teams. Where a research area is abandoned, the team members are incorporated in other teams. The coherence of a team depends on the culture of achievement and common aims fostered by the Team Leader and the IM. This culture easily survives low levels of turnover. However, experience has shown that the culture must be regrown if the team is disbanded and reformed in a few years.

The spinning off of new groups coincides with the personal development of a scientist who stakes out a research problem, convinces colleagues of the value of his approach, and gradually accumulates resources (material and staff) to pursue the problem.

"At first, the person is given minimal support, then if seen as promising, more resources are given. This new work would be added to his regular workload." MEBU PSO B

"I try to match the requirement to the skills and interests of the people who are doing the job....I find little point in forcing people to do things." ISSBU PSO A

"How we operate here and the way in which I supervise....growing a local culture with individuals who share those same aims and understand that (scientific) perspective." ISSBU IM A

"It's important to maintain (group) cultures; they are hard to grow back." CISBU Director

Since 1985, the polarisation of managerial and technical work has grown considerably in tandem with the sharpening of the customer-supplier relation and the growth of repayment work (DTI, EEC). Thus Team Leaders now do exclusively managerial work with no hands-on technical work. There has also



been growing emphasis on adherence to milestones and decreasing flexibility to adjust the work plan.

With more commercial work expected, a shorter-term orientation will be required in order to translate research into commercial products. This means more flexibility in work assignments for scientists and less attention to their preferred topics.

"I'm upset a bit about the little technical content in my work, but I want control, so I've learned to trade-off." MEBU PSO A

"Some will have to learn to let go of pet projects." Technology Director

## **ORGANISATIONAL CULTURE**

The interviews demonstrated a widely shared culture of civil service beliefs. As part of the **civil service**, RSRE shares certain basic assumptions and beliefs: employment for life, slow and fair promotions, strong link between grade and status, hidden agenda of politicians, and contribution to the well-being of the country. Anyone can become a manager through accumulated experience and some management training.

The interviews also indicated a variety of beliefs on science, that is, a **scientific culture**. Scientific breakthroughs are uncertain and unpredictable (Anderson and Kleingartner, 1987). Though science involves both individuals and groups of scientists, one brilliant scientist is worth ten good ones. Researchers are internally motivated by their desire to achieve and externally by their need for recognition; the two are inseparable (Miller, 1986). They respond better to rewards than to punishment. A scientist can best manage other scientists, and

management skills are obtained through experience and some training (Miller, 1986; Hill and Collins-Eaglin, 1985). Regular hands-on experience is necessary to remain an expert. Managers become progressively less technically able as they climb the management ladder, while maintaining a broad understanding (Allen and Katz, 1986).

Within a world-wide collegiate, scientists are guided by professional standards of achievement and excellence. Intelligent persuasion of one's colleagues is seen as legitimate; most other forms of influence are considered illegitimate and counter-productive (Miller, 1986). Expert advice is given to customers with the expectation that they will (and certainly ought) to listen.

Within RSRE, informal networks abound based on common scientific interests and friendship. Sharing of expert advice is highly valued. Some mutual support also takes place within work groups and teams, with indirect individual competition against standards of excellence. Regular coffee breaks and gatherings in the coffee room facilitate exchange of varied information on individuals and the organisation.

Two sub-cultures were anchored in the two departments and their different approach to research. Applied Physics had a significantly higher status because of its deep scientific roots, and its ability to recruit excellent scientists. Information Systems was seen as engineering related with a shallow foundation in science. Systems experienced regular difficulties in hiring premium skills sought by the civil sector. With the growth of repayment work, pockets of a new culture were being created where the distinction between applied physics and systems was less strong and where the two were seen as complements.

"We are trying to merge two distinct cultures....A systems designer cannot really afford to sit and wish." ISSBU Superintendent B

"The applied scientists saw the other side as ivory tower with their feet off the ground, and these lot saw the others as Philistines concerned with dirty things like communications systems and computers." Technology Director

The arrival of PM, DRA and projections of rapidly shrinking budgets created the momentum for a culture shift. Applied Physics was more vulnerable than Systems because of its relative distance from the customers. Senior management seized the opportunity to restructure the organisation with complementary integration of applied physics and systems. Participation of middle managers was prominent.

The actions of multiple change agents have quickened the transition. The three package managers and some BU directors have repeatedly emphasised the importance of the stakes at risk (organisational survival), and the need to put the customer at the centre of a manager's preoccupations. BU directors are taking more risks to secure non-MOD contracts. They argued that more collaboration should take place across BUs to harness the possible synergies of talent and technology.

## **CONCLUSION: BUSINESS STRATEGY & SKILLS SUPPLY**

Solidly anchored in a civil service and scientific culture, RSRE responded slowly to the growing pressures of the 1980s. Only with the contiguous introduction of PM and DRA did senior management mobilise the management cadre and



reorganise the establishment. The new BUs called for general managers and flexible research teams. Customer orientation, shorter projects, competitive bidding, and more rigorous project management characterised the new organisation. The new skills required would be difficult to recruit because of downsizing pressures and external recruitment competition. Reskilling the existing workforce was the only option.

## **SKILLS SUPPLY & THE INTERNAL LABOUR MARKET**

### **CURRENT SKILL NEEDS & SUPPLY**

Between 1980 and 1985, strategic skills included science-based skills, system skills, innovation, project management (within RSRE and in collaboration with other laboratories), financial and administrative skills, and communications and persuasion (within RSRE and at the interface). Between 1985 and 1991, these skills grew in importance, and the list has expanded: quality assurance, negotiation (within RSRE and at the interface) and bartering (managers within RSRE exchanging tangible and intangible resources), business development, and strategic planning. Many of the required skills were thought to be present in RSRE, but have to be exercised more rigorously. However, skill shortages do exist. Within management ranks, there have appeared new groupings of skills for Supers, BU Directors and Package Managers around strategic business thinking, negotiation/persuasion of customers, suppliers and collaborators, and planning of capability and deliverables.

Civilian and military organisations serving the military market depend heavily on the university graduate market (Lovering, 1991). In the past, RSRE has been

able to appeal more to the graduates' need for intellectual challenge and for opportunities to develop their skills. Civilian competitors usually offered better salaries, and recently offer relatively improved employment security. The greater emphasis on short-term work within RSRE has diminished the gap in challenging work that can be offered.

Science-Based Skills. Throughout the 1980s, in order to deliver the broad range of services required by MOD, a broad range of science-based skills was called for: materials science, device physics, math, electronics engineering, and frequencies.

A fast growing need was found for software, system engineering, and telecommunications, with acceleration in the second half of the decade. Chronic shortages were experienced. Also, a shortage of circuit skills (bridge to systems engineering) and assessment skills (evaluating proposed systems through computing) has developed.

There has been little success in hiring computing and communications graduates because of the premium paid by industry. These graduates became more attractive with the maturing of computing as a science.

"We have a shortage of circuit skills. It is the bridge to systems engineering....got to take them (ideas) to demonstration." MEBU Director

"There is a degree of amateurism in the way we run computer systems and large simulators....That comes from not having a culture of understanding software engineering. We don't have the critical mass of that expertise." ISSBU Director

"We have skill shortages in software and system engineering skills....80 positions not filled or filled by lower skilled people." Commercial Director

Innovation was sought primarily through long-term research with procurement horizons beyond 10-12 years. Brilliant scientists spear-headed the process. RSRE has maintained a high proportion of IM scientists who in turn have attracted other accomplished scientists and ambitious starters. A few departures in the last year has created some anxiety among management.

Project Management Skills. Team leaders (PSO) require a variety of skills: coordinating the contributions of small teams into a coherent research effort, guiding individuals in their work, listening for work and career problems and consequently adjusting the teams and work assignments, report writing to plan for the year and document progress, and some customer skills. Team leaders are also obliged to defend their assignments verbally and in writing. With the advent of PM, the administrative load had increased substantially.

Though no shortage of team leaders exists, the depth of skills remains shallow because of a regular though modest poaching of experienced PSOs and the low level of recruitment which has taken place throughout the 1980s. Shallow skills is particularly prevalent in computing and systems. Those team leaders involved with repayment work have had little difficulty in adapting to the PM requirements.

Quality Assurance. With shrinking resources and contract obligations of "doing things right the first time", each BU has assigned a quality manager to establish a process, with the expectation that, in time, operational managers (Supers and PSOs) will integrate quality requirements into their on-going activities. The skills involved are absent.



Financial Management. With the introduction of a commercial accounting system, all managers (Grades 5 to 7) have had to acquire a working knowledge of financial management through training. No skill shortages exist but their exercise has been superficial until the arrival of PM.

Persuasion & Selling to MOD. PM has formalised the informal working relationships. Adjustments have taken place smoothly in the applied areas. Listening to customer preferences and demonstrating customer responsiveness have increased. In contrast, scientists working in materials and enabling technologies were distant from procurement needs, and MOD staff often could not relate. Under PM, Supers tied to the technology packages and with no direct link to users seek to interest a variety of decision-makers within RSRE and MOD. A shift has taken place from justifying research with soft data on research impact to presenting hard data.

"In the past we were tactless....We have got to be far better at persuading people." ADBU Director

"Superintendents must present their work in a way that is comprehensible by the customers. Before we referred to the scientific community." MEBU Superintendent A

Business Development. This new department has a pressing need for new skills: competitive bidding in new markets (e.g., U.S. military market) and commercial presentations; persuasion of MOD customers and senior RSRE management of acceptable risks and benefits; venture management skills such as intellectual property and licensing negotiation, and development planning.

Entrepreneurial people are sought with action bias, good technical and managerial skills, and a market focus. Within BUs, similar skills are required to

a lesser degree. Traditionally not needed in RSRE, entrepreneurs would often pass through in their late 20s, early 30s after acquiring a track record. The current skills supply remains uncertain.

"The supply of entrepreneurial people is short in RSRE. Traditionally not needed. Entrepreneurs often pass through the establishment in their late 20s." Business Development Manager

Business development has increased the importance of planning and collaboration in the BUs. Harmonizing the work plan on the basis of aims and objectives, deliverables, and milestones must satisfy a variety of customers. Though not a set of new skills, greater expertise is required given the low tolerance for slippage and vague milestones. Increased participation in consortia (industry, universities and research laboratories) imposes considerable interaction of Grades 5, 6, and 7 with managers in other organisations for integrated workplans.

"Timeliness is the biggest change....Before if you didn't do it, well the job waited until you could do it. Now if you don't do it, the opportunity goes to waste." Package Manager B

"The role of BU director has become more demanding. He must produce a business plan with revenue goals, staff needs and deliverables." Commercial Director

## **INTERNAL LABOUR MARKET (ILM)**

Recruitment & Promotions. As part of the civil service, recruiting typically takes place at the entry level of Scientific Officer (SO) or Senior Scientific Officer (SSO). Senior positions are filled by internal promotions and transfers within RSRE and MOD. Similarly, some RSRE employees leave for positions within MOD or the wider civil service (e.g., embassy).

Promotions were managed centrally within CM in MOD. As part of career planning, CM strongly urged high potential PSOs to take an assignment outside of RSRE and within the MOD organisation (most likely CERN headquarters). RSRE and the other establishments were also viewed as an important recruitment source for scientific personnel for the civil service.

With constricting and inflexible budgets under PM, BU directors are seeking new ways of augmenting research productivity. Doctoral studies and post-doctoral work on site are being considered: RSRE would put laboratory resources at the disposal of these outsiders and the university or some other funding agency would cover their salaries. Decades ago, RSRE was considered a campus of Birmingham University. The relationship was not exploited, but the idea has resurfaced.

Consultants are occasionally hired on short-term contracts for bringing in absent skills such as quality assurance and commercial accounting. Occasional exchange agreements take place with firms. Contractors are also used for short-term unpleasant and routine work that regular researchers are reluctant to accomplish. Typically consultants receive higher compensation than regular employees.

Turnover. Aside from the rationalisation which took place in 1978-85, turnover figures remain very low (2-3%) and leavers include scheduled retirees. Within RSRE, professional turnover varies from negligible to 5% (Engineering). These low figures mask two different problems: skill shortages and the need for new blood.



Retention of new graduates has consistently been excellent, though recruitment levels in some areas (eg., systems engineering) has remained inadequate with some improvement in the 1990-91 recession. In the opinion of managers, aside from universities, there are few competitors for the physics and mathematics graduates that are attracted by the research excellence of RSRE.

In many areas, employees are spread thin, and the loss of a key PSO or IM can jeopardize a project. PSOs in mid-career are sought by large electronics-based laboratories in the private sector in the U.K. and the U.S.. IMs receive offers of chairs from U.K. universities and cash-rich opportunities in U.S. labs. On the other hand, because of the low turnover and slow growth since 1985, little recruitment has taken place, and often recruitment fails to fill the available positions. With little new blood coming in, the skill and training limitations of some of the older loyal employees became evident. The desire to stimulate the departures of these people was expressed, but the methods were uncertain.

Mobility. Below the PSO grade, transfers to other divisions was discouraged in order that the scientist achieve a high level of excellence within a narrow area. Thereafter, movement into other divisions was encouraged to broaden employee scope and as a preparation for a senior position.

In the Systems Department, senior management always tried to shift people from the Applied Physics Department to their area where skill shortages were chronic. Signal processing had a national reputation and recruited the best graduates; it could be used as an entry port. Their efforts were passively resisted by AP management such that little transference took place. Attempts by Personnel to encourage mobility in the late 1980s did not succeed. With the creation of BUs, some sharing of human resources was taking place.

"Over the last three years, we have tried several things to try and move people from physics to systems with very little success."  
Principal Personnel Officer

In summary, thoughtful skills deployment was mostly within and between divisions, with a variety of influences constraining deployment across units: skill building considerations, centrally defined career path for management, and local loyalty. To some extent, MOD and the civil service consider RSRE as part of their labour pool of scientific skills. The strengthening of scientific ILMs within the civil service was one of the achievements of the Fulton Report (1968).

## **HUMAN RESOURCE MANAGEMENT AS CONTEXT**

### **ADJUSTING LIFETIME EMPLOYMENT**

One of the cornerstones of the civil service was the belief in a career generalist made possible by competitive recruitment and life-long employment (Fulton Report, 1968). Supported by a centralised civil service personnel administration, employees were highly valued, and loyalty and dedication were the norm. Within the scientific establishment, these views were complemented by others generated by scientific research, in particular the dedication and talent of individual scientists as the source of excellence nurtured over long periods of time. Within RSRE, the researchers were considered the principal asset. The reforms of the late 1980s and 1990s altered this view by adjusting the time horizons and the liberty of research agendas, emphasising the managerial approach, and diminishing employment security. Some decentralisation of personnel responsibilities took place but at a slow pace.

## HRM WITHIN THE CIVIL SERVICE

The Northcote-Trevelyan Report (1854) established competence in the civil service through fairness and equity in recruitment and promotions, a uniform system of recruitment, class division of officials, and the central power of Treasury (Tyson, 1988). The Civil Service Commission (1855) ensured open and competitive recruitment. More recently, the Fulton Report (1968) recommended the modernisation of the Civil Service within life-long employment. Deficiencies found included classes of officials that were out of date with the work done, specialists with no authority, lack of general management skills, and weaknesses in personnel management. Though research establishments benefited from flexibility in task assignments, the multiple classes created inequitable career prospects and recruitment problems. On the positive side, the Scientific Officer Class attracted scientists of great ability, and was reinforced by the following arrangements:

Fluid Complementing. Numbers of posts at SO, SSO, and PSO are not determined by inspection and evaluation of each job but in terms of agreed percentages of the total complement of posts at the three levels. Its main effect is to permit the promotion of an officer who remains engaged upon the same work; his personal contribution is expected to be greater but the job itself does not change.

Individual Merit Promotion. An outstanding member of the Scientific Officer Class can be promoted to a higher grade (e.g., PSO to SPSO) and continue to undertake individual research work instead of undertaking the responsibilities of managing scientific work normally allocated to jobs at these levels.



Some of the recommendations of the Report were gradually implemented in the 1970s through the collective machinery of Whitley Councils and staff associations. Greenwood and Wilson (1989, ch.6) have summarized the changes. The "managerial" concept of the civil servant was rejected, and the "generalist" maintained. The unified grades structure was adopted for only the three top grades (referred to as the open structure), and mergers took place within classes. A single class was instituted for scientists, and career management was extended to all members of this class. However, much of personnel management continued to be centralised within MOD divisional headquarters.

In the 1980s, the Thatcher government increasingly challenged the Civil Service to improve services and to demonstrate value for money. The government diminished the power of the unions over labour markets by modifications of the Employment Act in 1980 and 1982 (Sisson, 1989). The 1980 negotiations and 1981 strike led the government to set up a Committee of Enquiry into Civil Service Pay (Megaw Report, 1982). The government decided to put more weight on its ability to pay and labour market conditions.

The Report went on to propose that civil service pay be enough (but not more than enough) to recruit, retain and motivate the employees while reconciling the national, economic and financial considerations of the government. It concluded that job security had a general effect, similar to career prospects, in attracting and retaining employees. The Report studied the question of whether pay negotiations should be decentralised to enhance managerial responsibility and involvement. It concluded this to be unwise unless it was accompanied by delegation of matching financial authority and appropriate measures of

departmental performance. It also argued that service-wide pay grades facilitated staff mobility within and between departments.

The Report encouraged the introduction of personnel practices common in the private sector, notably performance related pay, to give management a focus on performance improvement and help in recruitment and retention (strong performers attracted and fitting-in). However, tailored compensation packages to occupations or regions was discouraged.

Most of the Megaw Report recommendations came to be implemented. Accountable management made additional progress with the Next Steps Initiative (1987) which launched the creation of executive agencies and the devolution of general management responsibilities to the Executive Director. The transfer of responsibilities was done in principle, and details were left to negotiations with the Civil Service and Treasury.

## **CENTRALISED PERSONNEL FUNCTION WITHIN THE CIVIL SERVICE**

The changing structure of Personnel within the civil service is presented in Figure 6.3. Over the last two decades, the structural changes of the civil service represented two stages: centralised management of all HRM policies within the Civil Service Department (CSD) (1970s), followed by decentralisation among three central functions (1980s). First, Treasury reasserted the primacy of budgeting in personnel considerations. Second, the Efficiency Unit focussed on management improvements, and a residual third (presently the Office of the Minister for the Civil Service) grouped the remaining personnel functions. Government departments were very uncomfortable with the CSD and resisted

any erosion of their responsibilities and their role of coordinating and adapting these policy areas and their practice for that department's particular needs and circumstances. See Metcalf & Richards (1990) and Tyson (1988) for a general discussion of the issue of departmental autonomy and centralised control.

"The civil service remains centralist and restrictive. The personnel director (of RSRE) implements the volume of regulations."  
Corporate Secretary

## **CENTRALISED PERSONNEL FUNCTION WITHIN THE MINISTRY OF DEFENCE**

The personnel structure within MOD remained relatively unchanged in the 1980s (see Figure 6.4). RSRE (as part of CERN) was serviced by the Civilian Management (CM) Organisation. With close ties to Treasury, CM undertook all personnel activities MOD-wide: recruiting, monitoring probation of recruits, setting conditions of service, industrial relations, promotion, retirement, and career management. Up to late 1990, CM(S) recruited through the Civil Service Commission for new graduates. Recruitment of junior administrative positions was delegated to local units.

"Civilian Management (CM) is very old and at the centre of MOD...it undertook all personnel activities for MOD." DRA  
Personnel Officer

"The personnel department was a skeleton plugging into the central organisation." Principal Personnel Officer.

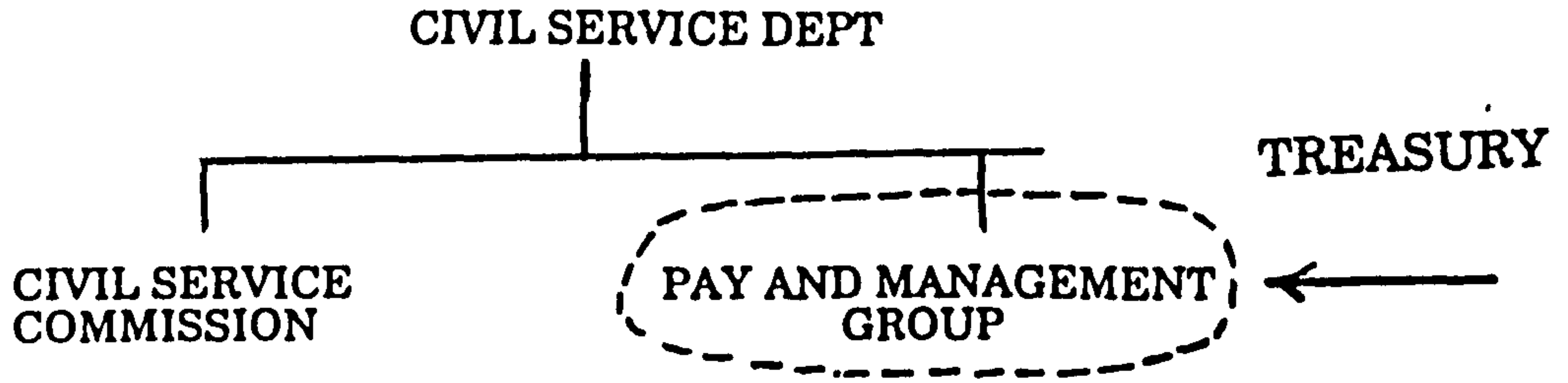
Training was the responsibility of both CM(Specialists) and another unit called CM(Training). CM(S) set training policy and organised a training programme for



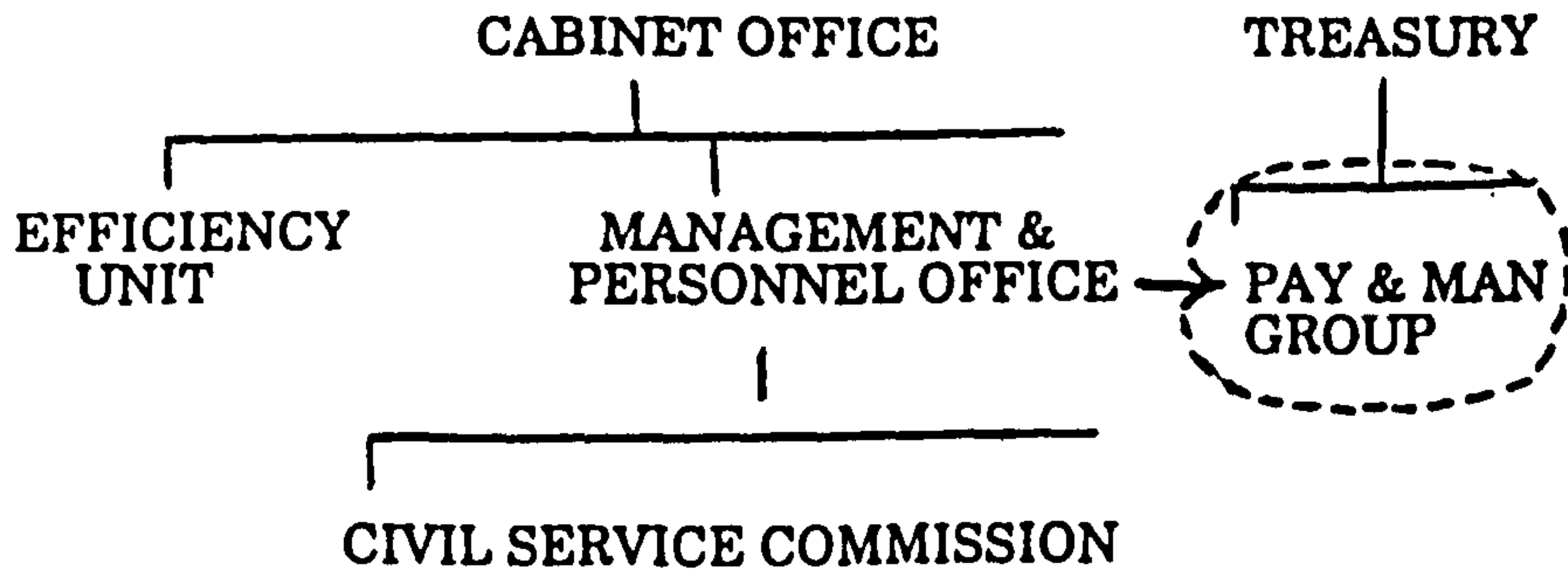
**FIGURE 6.3:**

**PERSONNEL ADMINISTRATION WITHIN THE CIVIL SERVICE**

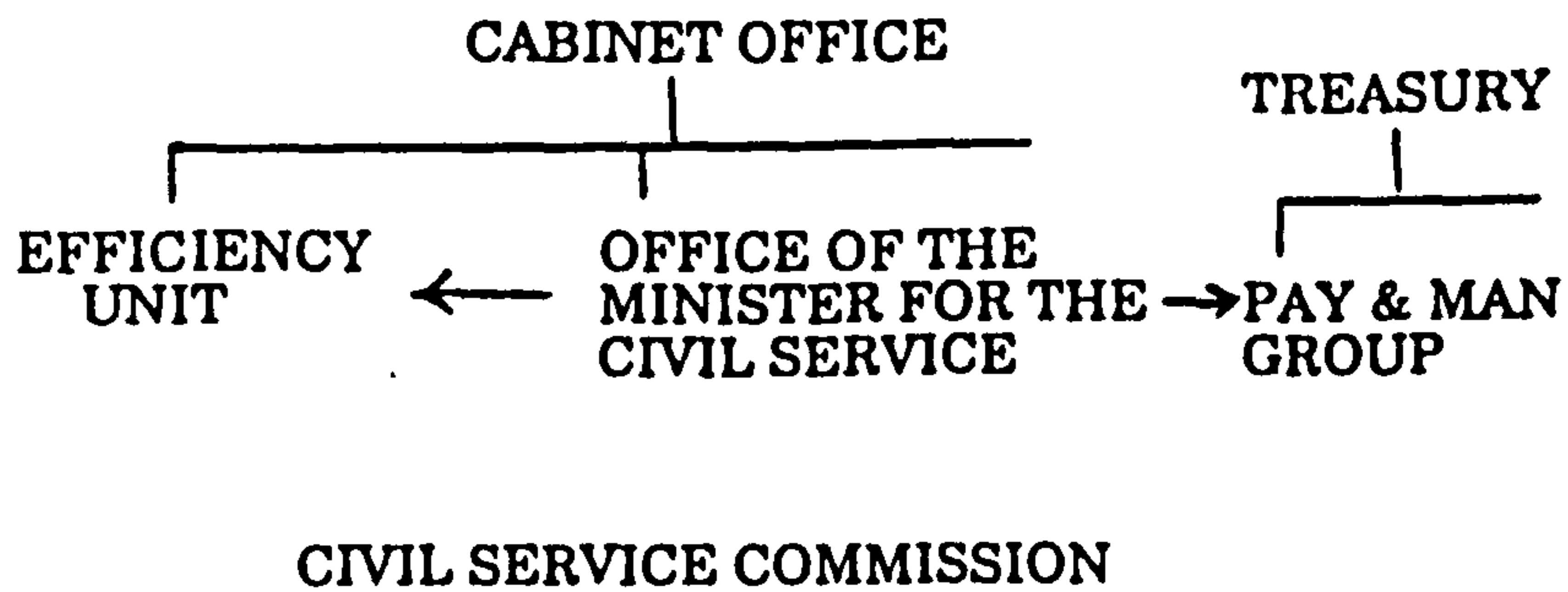
1968 - November '81



November '81 - 1987



1987



senior managers. CM (Training) offered training on general management topics (eg. project management), and would arrange for specialty courses as required with an outside provider.

On obtaining qualification from the Civil Service Commission (through its commissioners) and brought on board, an employee obtained an automatic yearly increment on the salary scale unless there was a discipline action. Pay was set by Treasury.

Promotions were managed through a CM(S) promotion board addressing MOD-wide candidates. The IM Scheme was structured by Treasury and coordinated by CM(S). The panel would have people from within MOD and from the community outside.

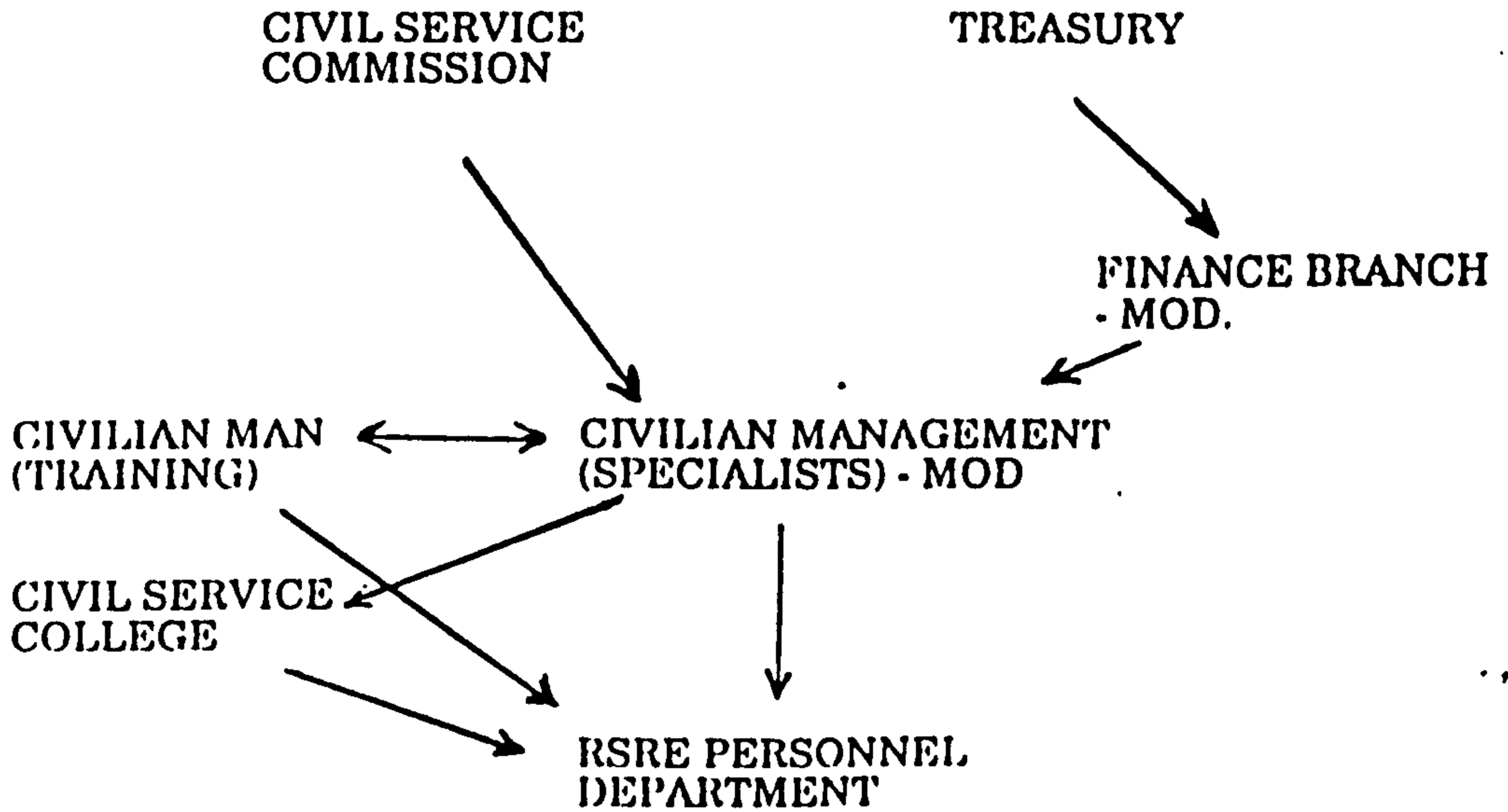
The relationship between CM(S) and RSRE Personnel was effectively that of headquarters and skeletal branch office. All employee files were kept at CM(S). From management perspective in RSRE, CM did not offer a coherent and responsive personnel service.

The McGraw Report and the Financial Management Initiative led to changes in 1983-88 which also impacted on RSRE (HMSO, 1988a):

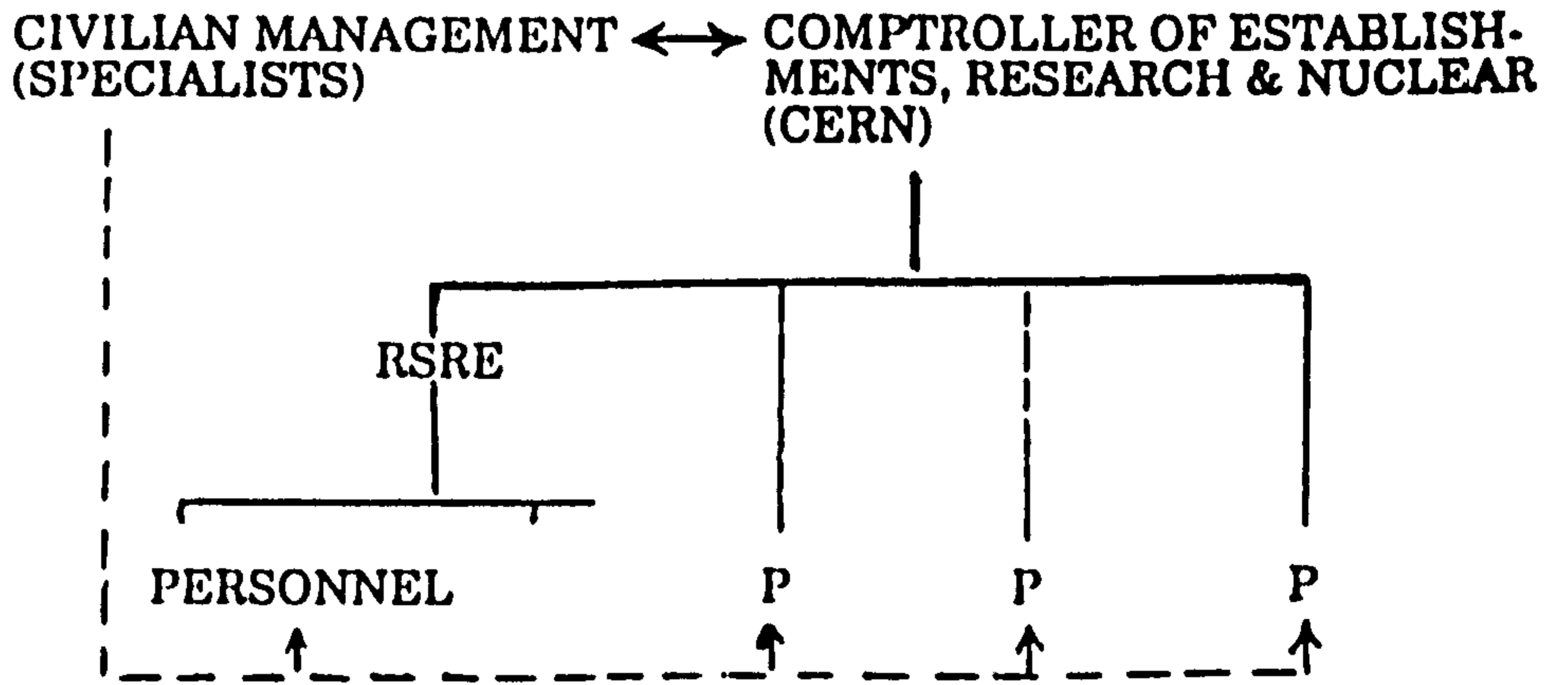
- some flexibility in recruitment pay to attract outstanding talent by moving up the salary scale by a few increments. It remained up to local management to argue its case to centralised personnel.
- expansion of the open structure down to Grade 7 throughout the service, thus standardising the grades and pay structure for almost all management and professional positions.
- a more open appraisal system based on reviewing performance against personal objectives.

**FIGURE 6.4:  
PERSONNEL STRUCTURES WITHIN AND  
AROUND RSRE**

UP TO  
1990



UP TO  
1990 - WITHIN MOD

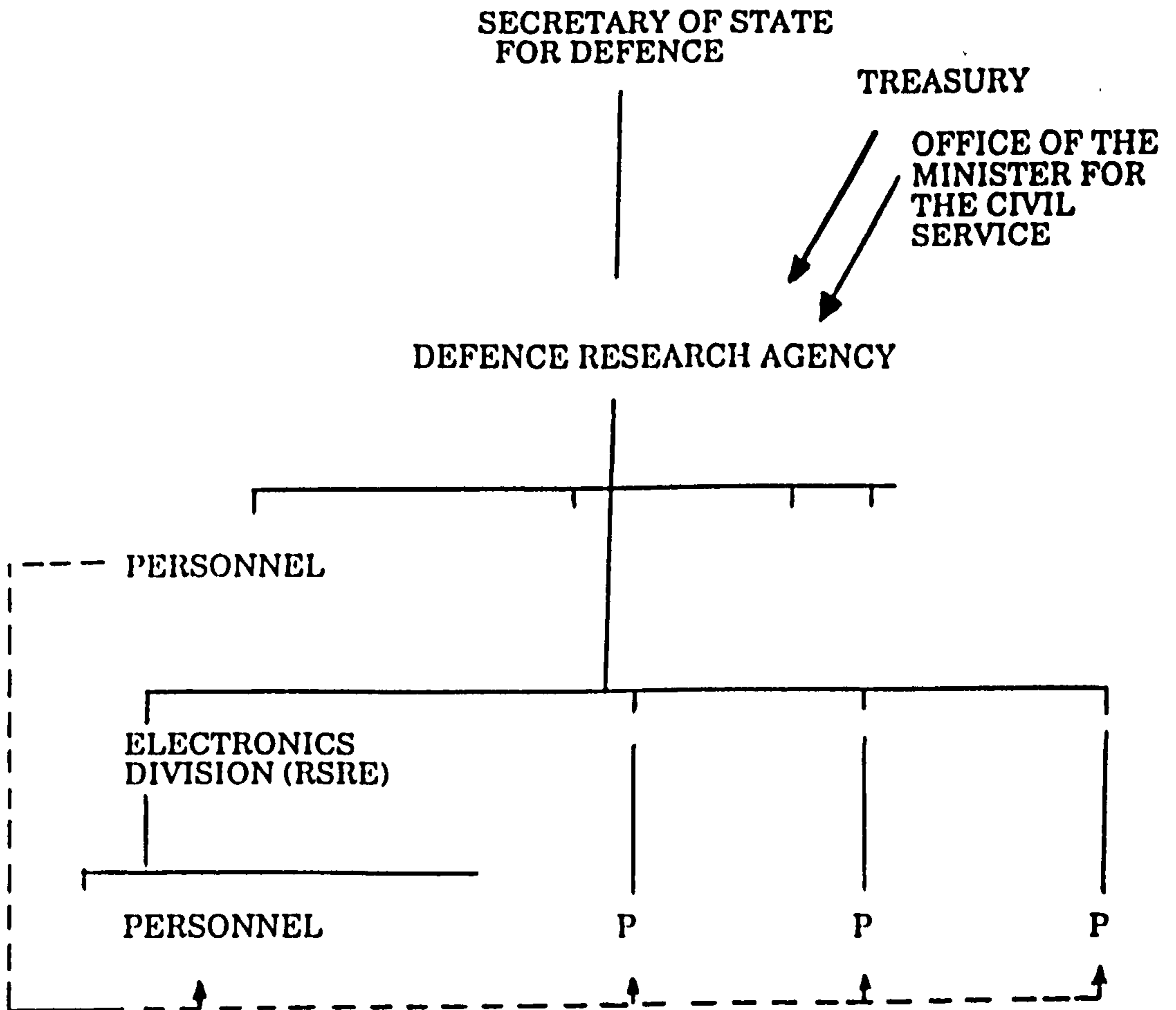


**NB Personnel policies and practices are effectively centralised**



FIGURE 6.4: (continued)

April 1991 - DRA



NB. DRA becomes an MOD budget holder until a trading fund is established.

- performance-related-pay and increments for outstanding performance.

## **PERSONNEL WITHIN THE DEFENCE**

### **RESEARCH AGENCY (DRA)**

The need for a stronger HRM role for managers had been argued by previous government studies (Fulton, 1968; Megaw, 1982), but without radical structural change, little progress was made. With DRA, general management responsibilities were devolved to the Executive Director, but negotiations with the Civil Service and Treasury were required. DRA created a structure which deletes CM in the personnel equation (See Figure 6.4), and is currently negotiating with Treasury and the Office of the Minister for the Civil Service to flesh-out the policy framework.

Distancing from centralised civil service organisations has already taken place. Before, the Civil Service Commission would do all graduate recruitment. When the Commission became an agency and began charging for its services, DRA set a policy of doing its own recruitment.

The extent of decentralisation to Divisions like RSRE and their personnel departments remains uncertain. The DRA management agreed to develop local personnel functions with more responsibilities. The new RSRE Secretary was chosen for his mix of skills including personnel and organisational design. The department has initiated some manpower planning and continues to strengthen its role in Grades Reviews, a development appreciated by line managers. To ensure relevant policies, a scientific staff committee was created reporting to the Technical Director, not the Corporate Secretary.

The gradual decentralisation of HRM likely will accelerate. The DRA framework document specifically provides for agency-specific personnel policies, and existing agencies have taken steps in this direction (HMSO, 1990). Several ideas were being discussed: improvements in starting salaries, premiums in some disciplines, slower growth of salaries at the top end, and stimulating selective turnover to bring in new talent. However, RSRE managers remain sceptical that they will achieve the desired independence from the civil service.

"With the DRA reorganisation, personnel now has flesh and blood."  
Principal Personnel Officer

"Agency status was the worse option for personnel management because of continued controls by Treasury and the Manpower Office. It represents delegation without flexibility." Corporate Secretary

## RECRUITMENT

Recent graduates are recruited from universities across Britain through career fairs and national advertisements. Recruiters have noticed a reluctance of young people to work for the military establishment, and therefore emphasise the exciting nature of the work. In the last few years, RSRE ads have been placed instead of MOD or civil service ads, thus using RSRE's profile as a quality and achievement oriented laboratory.

Recruitment is supported by personal networks which operate through work contracts, visiting professors (RSRE staff), and IMs searching for promising talent to support their research programmes. RSRE designates a few line staff to liaise with a particular university. Extramural contracts are used to solidify relations with the universities and serve as a platform for the identification and



recruitment of talented individuals. Early targeting of talented individuals takes place, and personal and research support may be provided.

Lack of Timeliness. RSRE managers complained that it took between 3 and 12 months after the initial interviews to obtain entry. Multiple steps were involved: obtaining the qualification certificate from the interview board; centralised confirmation of the availability of an opening; written confirmation of the candidate's interest; obtaining security clearance; offering an RSRE employment contract. Several candidates are lost to competitors during this period.

In order to retain candidates during this uncertain period, each candidate is matched to an employee who maintains contact and reassures as much as possible. Fellowships (1-2 year contracts) are offered while the recruitment process takes place. However, few fellowships are available and this solution is frowned upon by the Civil Service because it undermines open competition. Both the timeliness problem and the short-term contract solution were mentioned by Fulton (1968), implying no significant change in 20 years.

In April 1991, all government departments and agencies were authorized to do their own recruitment and employment below PSO (Grade 7) level. However, the recommended procedures were stipulated and only a little flexibility was obtained.

"A great many were lost during the recruitment because our system turns people off. It is cumbersome and slow compared with industry." ADBU Director

"For quick entry, we have used term appointment or fellowship. Later we invite to apply to a board." Principal Personnel Officer

## TRAINING

Several sources of training operated: centralised civil service, CM in MOD, and courses organised by local management. Whereas employees have free access, the offerings tend to be ad hoc with a weak linkage to career concerns. Managers emphasise on-the-job learning. The content of the courses have a high technical content with less attention to transfer in the workplace and adaptation to change.

Training of recruits involves on-the-job training and spans up to five years depending on the learning curve. All scientists are expected to learn to use a personal computer and a variety of programmes to assist them. Formal training is offered by CM and by RSRE line management, complementing on-the-job training with the individual employee coordinating the two. Recently, BUs have helped to focus training to business requirements.

"For scientists, the main thing is to gain more experience in their field: training on the job and by attending conferences." Technology Director

"We do mostly retraining on the job...I am now looking to standardise on a reduced number of languages so that we can get people trained on all of them." ADBU Director

"There are certainly opportunities for training if you want to take them up....Typically you have to use your initiative." ISSBU PSO  
A

DRA & Training. CM transferred its 1991 training budget to DRA headquarters. To the consternation of the divisions, the personnel director committed all of the

funds without divisional input. This action contradicts the stated aim of devolving responsibilities to the division.

## **CAREER MANAGEMENT**

Upon entry, researchers are encouraged to define their interests and carve out an area of investigation. Self-tasking is seen as the driving force and strongly linked to retention; employees develop high commitment when they have defined work priorities. Organic growth takes place over 5-10 years as researchers expand their skills and apply them to new problem areas. PSOs stretch their promising scientists and encourage breadth of skills to satisfy promotion criteria. Supers reinforce this process by linking into the Annual Performance Report and identifying opportunities across teams within the division.

Through on-the-job experience, employees are prepared for management positions with mixed results. Management learning is considered incremental: running small projects, managing extramural contract work, and gradual accumulation of more responsibility. Both skill groups (technical and managerial) are developed at the same time as part of fluid complementing.

"You do a certain amount of moving...to get through the next promotion board...preferably learn another skill." ISSBU Superintendent A

Career planning as such takes place through the Grades Review which determines promotability ratings. For middle management positions (above PSO), scope of experience is emphasised. For promising PSOs, CM advises a transfer or secondment to London Headquarters of CERN or to some other posting in MOD. Centrally-managed promotion boards were criticised by RSRE



management, echoing the Fulton Report (1968): undue importance attached to the candidate's performance before the promotion board in comparison to past performance and suitability for the job.

As of 1989, RSRE (rather than CM) became responsible for the Grades Review for up to SSO. The BU director and Supers meet with the Principal Personnel Officer (chair) to discuss the employees of each grade at a time. The review focuses on readiness for a promotion and a move for greater scope. It also makes training recommendations which are sent to the Super and the training office. The Principal Personnel Officer saw his role as linking internal recruitment, training and career development, and acting as a counterweight to line managers desiring to keep their staff.

In practice, each employee receives 10 minutes of attention at the Grades Review. Despite the quick reviews, line managers have come to appreciate the advantages of the reviews. They supply helpful information for adjusting job assignments and determining the timing of a promotion request.

"These (new) grade review boards work well. At first managers were unsure, but they came to see the advantage." Principal Personnel Officer

The Review accesses employee confidential data concerning their long-term potential rating which is kept from the employees themselves. The potential is estimated three grades in advance in order to plan for development measures. Employees come to guess what their rating is by the overtures made to them.

RSRE managers control task assignments, development through on-the-job training, and performance evaluation, influence merit increments, and contribute

to career development through the Grades Review up to SSOs. However, they lack control over the salary scales and promotions. The latter are centrally determined and serve the wider MOD and civil service needs. Some managers are reluctant to propose their talented employees for promotion for fear of losing them or of failing to deliver a promotion. Managers also complained about slow response. If a talented employee comes to his manager with news of an offer from outside, the manager is unable to counter with an immediate prospect of promotion. The dates for the review process are set centrally, and it takes one year from application to an uncertain promotion. Faced with limited openings, "ticketing" has been introduced, that is, a promise of a promotion for those with successful boards.

"We have a promotion system that is a labyrinth." ISSBU PSO B

"It takes twelve months for a promotion and it happens once a year. There is no flexibility to respond to an offer someone has just received." MEBU PSO A

"He could easily be posted out to a job that is totally unsuited to him rather than allow me to say I will just pay him more and promote him internally." MEBU Director

With the continuation of shrinking budgets and the introduction of PM, some PSOs have become reluctant to risk stretching their people because of the importance of succeeding at this early stage. Thus employees with high potential have new work stacked on (highly enriched) while those with less obvious potential have little stretching. Prior to PM, Supers varied in the extent of delegation they practiced with their PSOs. With the advent of PM, Supers are more inclined to delegate more budget and administrative responsibility to the PSOs in preparation for senior positions.



## CAREER PATHS

Fluid complementing provided for flexible degrees of technical and managerial responsibility for the lower technical grades (up to PSO). In the early 1980s, it was possible to become a PSO without managerial experience or knowledge, and higher managerial grades continued to have some contact and influence on technical work. PSO also was the platform from which a person wishing to remain in the technical area could pursue IM status for technical excellence where several grade promotions were possible.

In the 1980s, fluid complementing began to degenerate in response to the growing administration required of managers. By 1985, with the introduction of more rigorous reporting and monitoring by the MOD customer and the increasing repayment work, Supers (and PSOs to some degree) became administrators with little direct lab contact.

As part of this polarization, becoming a PSO required some management awareness and preferably experience. It was still possible to become a PSO on technical merit, but only if the employee had demonstrated exceptional performance. In a sense, researchers were required to make an earlier choice about their career path, whether it be in the management or IM stream. Though fluid complementing remained, the number of positions using this option was controlled centrally.

"People seem to be required to make decisions about going into the managerial stream well before they have reached the point where they feel they have done enough, contributed as much as they could." ISSBU IM A

"In the past we had fluid complementing and people really moved where their aptitude led them....Now you have promotion on ticket



to PSO. There has got to be a slot for you to go in....The available positions are almost totally managerial." ISSBU IM B

The few positions created blockages for aspiring IMs. On the IM side, a corresponding change took place where the researcher was expected to concentrate fully on long-term research and academic achievement. IM status depended on successful evaluation of the researcher's quinquennial plan by the IM Committee composed primarily of outside academics. Every five years, a new plan must be presented, and loss of renewal means in principle loss of status and degrading to level 7 (PSO). In practice, the researcher usually obtained a management position at the equivalent grade occupied under IM.

In 1989, the IM scheme was transferred to MOD but remained unchanged. Meanwhile, RSRE had a growing need to integrate the applied physics to the systems area. The IMs operated in the area of strategic research as approved in their plan and with local management guaranteeing the needed resources. But management would ask them to assist work in shorter term work requested by the military customers. Though IMs did not object to addressing shorter-term problems (some enjoyed bringing their ideas to the concrete application stage), they tended to resist.

With the advent of PM and DRA, there has been wide recognition that the terms of reference of the IM committee should be adapted to the new business environment and serve DRA's interests. DRA Headquarters assumed responsibility for the IM scheme but postponed making any changes.

## **POTENTIAL CAREER PATHS**

With the advent of PM and DRA, a variety of new positions have materialised at RSRE and at DRA headquarters. The management career path was straight forward before (PSO -> Superintendent -> Group Head -> Department Director -> Managing Director). In the new organisation, a variety of positions exist at the superintendent level (Package managers, Manager of Business Development, Line and staff Supers depending on the internal structure of the BU). Group Heads became either BU directors or the director of business development and planning. Senior positions are also available at DRA Headquarters.

New positions within Business Development also will open up, and employees with entrepreneurial drive or those wishing for a more dynamic environment will be attracted. The desire to hire people from the outside with business experience could create a problem in that their relatively low sophistication in research would preclude their ability to benefit from career opportunities within the remainder of RSRE.

The mobility (and development) of staff across MOD, DRA Headquarters and RSRE remains to be defined, though the framework document clearly indicates maintenance of the MOD link.

## **CONCLUSION: HRM & SKILL SUPPLY PATTERNS**

Centralised personnel within the civil service imposed standard policies and practices on RSRE which were viewed by managers as unhelpful to manage the workforce. They compensated by doing their own recruitment informally, developing close ties with certain universities and their promising students. The



work organisation emphasised self-tasking and on-the-job development; individual preferences in careers were possible through fluid complementing and IM status. Customer and administrative pressures grew in the 1980s and polarised to some extent the technical and managerial roles, thus causing some deterioration in career flexibility. The possibility of sustaining long periods of focused research diminished as customer power grew and customer responsiveness became essential. Some decentralisation in personnel activities took place, but RSRE did not control recruitment salaries and most promotions. The arrival of PM and the DRA raised many questions about what shape HRM would take.

## **INTENTIONAL SKILL SUPPLY PATTERNS**

### **WORKFORCE PLANNING**

Workforce planning was an additive process which depended on the financiers. Operating under long-term costing, the government contributed most of the funds and imposed a salary budget and headcount controls. The number of IMs was also controlled. These funds and positions were distributed downward within RSRE in response to lower management justifications and with considerable continuity.

Other sources of funds such as repayment work and international collaborations had separate budgets and staff tied to them. In practice, management attempted to pool resources to stabilise a variety of research projects. The inability of the applied areas to recruit specialists in high demand led to shifting resources into the theoretical areas which never lacked ideas or recruits. Thus some divisions



were overstaffed and others understaffed. Turnover rates were low, and management concern was limited to talented individuals with scarce skills.

"We prepared a yearly Stewardship Report for the CM: resignations, retirements, promotions. Recording only." Principal Personnel Officer

"Never had a big problem, low wastage rates...What worries us is loss of high quality people in key areas." Commercial Director

## **TRANSITION FROM WORKFORCE PLANNING TO SKILLS PLANNING**

With the arrival of PM and DRA (1989), RSRE Personnel, in conjunction with senior management and with the approval of the centralised personnel function, tried several ways to encourage movement into areas of shortages with little success: facilitated promotions, shadow portfolios, and trouble-shooting roles. These initiatives coincided with the arrival of the new Secretary and the devolution of grades reviews (for promotion purposes) to the establishments.

The full implementation of PM and the DRA meant that staffing levels must match the work assignments and their schedules. Overstaffed divisions have instigated measures to bring the numbers down (e.g., In MEBU, no recruitment until retirements and departures help achieve the targeted level). Understaffed divisions have made a concerted effort to recruit to strength and with some success. Thus manpower planning has been introduced at the level of BUs. The Staff Committee headed by the Technology Director fosters an organisation-wide view of the issues, with Personnel in a supportive and implementation role.

"The Staff Committee takes an RSRE-wide view of mobility."  
Commercial Director

"First, the Director of Technology must define the requirements. We interact directly and through the Staff Committee." Corporate Secretary

BU directors and their Supers have also given more attention to the skillbase within the unit. In MEBU, the mix between material and circuit skills may have to be adjusted in order to demonstrate applications to customers. In ISSBU, the concern for a critical mass has emerged; a critical minimum of scientists are needed to create a supportive and expert environment in which a project can be achieved in a timely and quality manner. All BU directors have joined a skills audit commissioned by one of them.

"I'm concerned with skill balance, recruitment issue, flexibility and deployment, some training concern. I've only started doing this." MEBU Superintendent A

"...outside contractors....You not only lose the opportunity of developing your staff's skills...but also you give those to your competitors, the system houses." ISSBU Director

BU directors are considering ways of making better use of their shrinking human resources. Recently, ADBU and ISSMU have pooled resources and created a five person team. These two BUs focus on the same signal processing technology, and joint ventures are being considered with ADBU as resourcer and ISSBU as skills source. ADBU is seeking a transfer of skills.

In the 1980s, expert skills were spread thin to maintain a broad scope of research activities. Some people began to worry about the critical mass of leading researchers and supporting networks required for excellent research. On the other hand, the consistently low turnover rate tended to lull these worries away such that no concrete retention objectives were formulated. Though each



departure of outstanding talent was mourned, experience had shown that a research programme could adapt and succeed; the essential contribution of the brilliant scientist remained uncertain.

Currently, management remains unconvinced that special efforts need to be made to retain employees, though some efforts are deemed appropriate to improve morale. With the recession extending further, employment opportunities outside remain limited with uncertain advantages. Furthermore, in the more competitive environment, some managers are inclined to stimulate the departures of the less productive scientists and managers in order to bring in more achievers.

Middle and senior managers wanted to increase the mobility of skills within RSRE. They demonstrated high interest in establishing only two science grades: junior scientist (SO, HSO) and senior (SSO, PSO, SPSO), thus moving people up on an extended scale of performance and responsibility.

"I have not developed a retention policy because there is no evident need." MEBU Superintendent

"There is not enough turnover, need a minimum of 5%. We are considering ways to increase the flow." Corporate Secretary

"I would like to see a much more mobile population. It is a much more innovative environment when people are coming in and going out more quickly." MEBU Director



## **HARD & SOFT BENEFITS**

Continuity in hard and soft benefits was high in the 1980s, but incremental changes were taking place. The 1990s have the potential of triggering more rapid change.

### **HARD BENEFITS**

#### **Base Salary, Benefits & Incentives**

The base salary was the most important component of the compensation package. Intentionally pegged to the average of the national labour rates, salary flexibility was minimal; RSRE was unable to match high salaries offered for scarce skills of early and middle-career individuals. Management made continuous representations to be allowed to place outstanding candidates higher on the salary scale. In the mid 1980s, some flexibility was obtained. However, no incentives existed except for small bonuses which management rarely used. Under the DRA, management would like to offer competitive salaries for scarce skills.

Benefits were comprehensive and described as "cradle to grave", but included no luxuries such as a company car or enriched health plans. The government pension was highly rated by older employees.

"We can give a one-time yearly bonus of £50 to £500...It should be used more often (instead of the additional increment)." Principal Personnel Officer

## **Pay Policies**

Operating within the civil service organisation, RSRE had little flexibility in employment offers. Full-time permanent positions were typically offered. Contract positions reflecting the standard salary scales were offered as a quick way of entry, followed up with the standard hiring procedure. This timely solution has been practiced for decades (Fulton Report, Vol.2, para. 223). More short-term and lucrative contracts have been given to satisfy critical skill shortages.

Life-long employment was the rule, and any downsizing was done at the expense of the organisation. Fairness and equity were high and valued by employees. Salary scales were visible, and the compensation package arrived at by national collective bargaining. Few perks (e.g., separate dining room) were available for managers. A rudimentary form of pay for performance was introduced. The annual increment was automatic and long-term performance emphasised. However, an additional "merit" increment became possible in mid 1980s for consistently high ratings on the performance review. Management sometimes used it to compensate an employee for low salary or loss of a promotion. Salaries were job-based and encouraged a long-term focus through the automatic annual increment.

"If you receive box 2 for two consecutive years or box 1 for one year, you can go beyond the top of the scale." Principal Personnel Officer

"The system does not allow withholding of rewards." Technology Director

## **FUTURE MODIFICATION OF HARD BENEFITS**

The implementation of PM and the DRA, and the expected empowerment of management, prompted a rethinking of pay policies. Rationalisation from 12000 to 7000 would take place over five years. Pay would be determined by direct negotiations with the unions but within civil service constraints. The involvement of divisions such as RSRE was uncertain. Managers were willing to sacrifice some consistency to bring-in scarce skills. Senior management considered making budget allocations to BUs partially on success in obtaining contracts.

RSRE management wanted the ability to recruit critical skills, notably system skills and commercial experience. The current salary scale was unable to bridge the significant gap in salaries paid by the civil sector for computing and telecommunication skills. Similarly, the civil service recruitment rules did not place a premium on commercial experience, and high salaries could not be offered. Therefore, commercial skills were hired for short-term consultancy. RSRE also tried short-term commissions through the civil service and MOD recruitment but without success. Civil service rules permit rehiring but at the same grade as when the person left the service.

"Industry does not put much money into those people (over forty). It puts its money into the people it wants...and recruits." ADBU Director

"The signs are that people are looking in a way not present in preceding years....We are unable to reward people for the work they do." Package Manager B



## SOFT BENEFITS

Important changes took place in the content and organisation of work for researchers and managers which were reflected in career development. Other soft benefits were constant: informal listening (within RSRE and in the community) by all managers of employee complaints and dissatisfactions; pleasant community (Malvern) and quality of life (large houses reasonably priced, beautiful natural surroundings, opportunities for spouse employment in schools and nursing homes, and tolerable distance to Birmingham for spouse employment). However, young singles were reluctant to situate in this isolated town. The general recession and the hard hit U.K. electronics industry (recession and military cut-backs), as well as contraction of work in universities, diminished alternative employment opportunities in the early 1990s.

Challenging Work. In the early 1980s, the research programme was internally driven and thus ideal from the researcher's perspective of long-term skill development and recognition by peers. Whenever possible employee work preferences were given priority, even when this caused sub-optimal use of the skills in the group concerned.

By 1985, a noticeable shift took place with the MOD customers insisting on determining the research agenda. The introduction of PM and the DRA (1989-1991) greatly strengthened customer power. Researchers in long-term research have had to revalue their work accordingly and accept that flexible work assignments were necessary for customer responsiveness and employment security.

The shift to shorter-term contracts also was taking place within the wider military industry which was becoming more export oriented (Lovering, 1991). Changes in employment practices were introduced such as redistribution of tasks between engineers and technicians to make better use of available skills and create a leaner organisation.

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Within RSRE, the polarization of managerial and technical work centrally imposed since the mid 1980s was meant to improve project management and research output. Managers felt burdened with administration but continued to enjoy decision-making. They quickly adopted broader management roles in the 1990s. Team Leaders, on the other hand, felt somewhat isolated by their separation from general management responsibilities.

"Scientists thrive on recognition. It takes five to ten years to obtain it...We are unable to separate science from recognition." MEBU  
PSO A

"Almost every week we get a new thing that we have got to account for and PM has been nothing but pain and grief for everybody."  
ISSBU IM B

Career Development. Fluid complementing worked well for both gradual increases in project management and administrative responsibilities. It also made possible a variety of team structures around the project leader and the IM. Additionally, two career paths were well articulated: technical with some people achieving IM status, and managerial. In the 1980s, the paths became polarized and impacted on more junior positions. The arrival of the DRA was seen by some as an opportunity to rejuvenate fluid complementing and create a career development system serving the DRA instead of the civil service.

"Most people are willing to tolerate some unpleasant work to pursue pleasant work. If you get the ratio wrong, you lose them."  
Package Manager C

"The accountants running of the thing, deciding which research should be done and not done....It just gets to a stage where people (IMs) jump, they have had enough." ISSBU IM B

"The biggest thing that might make me leave is that nobody knows what we are supposed to be doing....The fact that we have not seen a customer is daft." ISSBU PSO A

## **CONCLUSION: COMBINING HARD & SOFT BENEFITS**

Very few changes have taken place in recruitment and retention practices because of the general success in these areas (with the exception of recruitment of some skills) and because most of the decision-making in HRM was centralised outside RSRE. Management believed that a critical mass of expert researchers was required to maintain the highest level of professional excellence. This applied in each technology area, and in particular applications with proven value (eg., surveillance) or potential value (eg., speech recognition). With increasing budget pressures and the need to create new streams of business, the adjustment of the skillbase has caught the attention of senior and middle managers (1990). So far, no coordinated adjustments of hard and soft benefits have taken place; DRA headquarters has yet to articulate a strategy for rationalising the headcount from 12000 to 7000 for its four divisions (RSRE being one of them). Senior management in RSRE are engaged in actively influencing the strategy formulation and the likely restructuring. They favour a decentralised structure with regrouping of skills.

RSRE has relied on graduate recruits who have been socialised to strive for professional excellence by relying on self-drive and self-direction according to



peer standards. These characteristics were valued by RSRE and its scientific culture. Consequently, the extensive use of challenging work, and career development closely tied to challenge, are consistent with the characteristics of the labour market accessed for most entry positions.

Though not the leaders, and offering no innovative rewards, civil service compensation standards are comparable with the average of other large employers. Those interviewed seemed reasonably content with their hard benefits, especially the more senior people, but little emphasis was placed on them.

In the new environment of PM and the DRA, greater attention is being given to hard benefits, but until the DRA has attained a level of independence, RSRE management are unable to adjust the benefits package.

"If some of the satisfiers disappear, some of the dissatisfiers come to the surface, like money...If the bureaucracy goes too far, why should he be here instead of in industry?" ISSBU Director

"The reason they stay is they like the working environment. If it changes to a more commercial approach, they may expect more commercial rates, but so might DRA offer them." Technology Director

## **SUPPORTING BUSINESS STRATEGY WITH A SKILLS SUPPLY STRATEGY**

Prior to the mid 1980s, RSRE dominated MOD through research excellence and effective control of its budget. The long-term orientation of the scientific researchers and managers and the careful recruitment and development of talented individuals assured research excellence. Downsizing pressures were

managed through minor adjustments to all programmes, thus maintaining development opportunities.

The creation of the DRA and the imposition of PM obliged RSRE management to increase customer responsiveness and develop a flexible skillbase more appropriate to meet customer demands. Tight project management and flexible research teams would address both short-term and long-term research requirements. The creation of BUs gave middle managers more scope to act as general managers and to adjust their skillbase within difficult resource constraints. Elements of skills planning were beginning to emerge, and modifying hard benefits was considered essential for future success.

### **INFLUENCE OF HRM ON SKILL SUPPLY PATTERNS**

The scientific culture of RSRE was at odds with customer requirements for more short-term and systems-oriented work. The more traditional scientific areas continued to command the attention of senior management, receiving more than their fair share of resources. These actions supported traditional scientific careers and disadvantaged the information systems area. The 1980s push for accountable management and the accompanying polarization of management and professional roles damaged the existing career paths.

Highly constrained by centralised bodies within the civil service (e.g., Treasury), RSRE obtained some HRM responsibilities in the 1980s; managers successfully pushed for improved recruitment salaries. Most of the HRM flexibility is attributable to line managers and IMs: localised manpower planning, recruitment through personal networks, tailoring task assignments and maintaining contact with employees.

Modifications of the HRM culture were taking place in the late 1980s in response to PM and the DRA. The narrow view of science was being replaced by a broader one embracing systems science and the legitimacy of the customer. Career paths were being reconsidered, and modifications of hard and soft benefits were sought to shape and influence the skillbase for the new performance requirements. Meanwhile, the military and related civilian industries have introduced individualised pay, performance related pay with significant financial rewards and fast tracking, and have doubled their efforts in targeted recruitment (Lovering, 1991). RSRE faces a significant catch-up problem, and obtaining wide flexibility remains doubtful so long as core government remains unchanged (Dopson, 1993; Mellon, 1993).



## **CHAPTER 7: SKILLS SUPPLY STRATEGY**

In this chapter, the case studies (IBM, BT & RSRE) presented in the preceding chapters are compared and contrasted in order to explore the variety of skill patterns. Candidates for an explicit skills supply strategy are evaluated:

- A: Modifying management style (BT)
- B: Increasing graduate recruitment salaries (RSRE)
- C: Decentralising recruitment and operations (R&D in BT)
- D: Introducing a 100% software mission (in Hursley Lab, IBM).

### **CRITERIA FOR SKISS**

In Chapter 2, it was proposed that a recognizable pattern of changes in HRM policies, programmes and practices would qualify as a SKISS if four criteria were satisfied:

- (1) an identifiable link with the changing business strategy;
- (2) managerial intentions to create and maintain HRM support for the business strategy;
- (3) a coherence among the HRM elements which are mutually reinforcing in terms of supporting the business strategy;
- (4) a consistent managerial effort to achieve and exploit the desired linkage to business strategy.

The notion of SKISS lies in the relationship between business strategy and the skills required to translate the strategy into business practices and internal management systems. As the business strategy changes, one would expect to find coordinated changes in skill supply components which together would modify the skillbase. In some cases, modifying a single key supply component might

constitute a strategy. But if only single-lever examples are found, we would conclude that tactics rather than strategy were present. Business strategy linkage and coherence of HRM components aside, SKISS presumes that senior management, with the help of middle management, deliberately and consistently seeks skill advantages that support the business strategy. The process is assumed to be primarily top-down unless demonstrated otherwise.

The application of the above criteria to four promising skill supply patterns will determine whether these patterns qualify as SKISS.

### **SKISS CANDIDATE "A": MODIFYING MANAGEMENT STYLE IN BT**

A small group of senior managers initiated and sustained the transformation of the management group. Consistent external recruitment of private sector managers and exiting of senior public sector managers took place in the period 1984-91 in the form of voluntary resignations and voluntary redundancies. The initial trigger to this skills supply pattern was evidently the change in status for BT into a publically-traded private enterprise. Senior management was challenged to create a business strategy appropriate for the new environment. Skill gaps within management ranks were obvious, and a new organisational culture was required focused on markets, customers, competitors, and profits.

Senior management orchestrated a pattern of repeated downward pressure through a variety of levers: a change in recruitment policy and employment contract, restructuring for competitiveness (1984 and 1991) with voluntary resignations and voluntary redundancies, and an organisation-wide culture-

change (TQM) programme. The rapid introduction of these changes and their consistent application thereafter created, after a five year period, a growing upward pressure from lower levels of management to expand the new management style. Eight years after the introduction of this skill supply pattern, the transformation continues.

In contrast, both RSRE and IBM were noted for a slow and normal renewal of senior management through retirements and promotions from within. The pace of change did accelerate in RSRE in 1991 with the creation of the Defence Agency, but internal promotions remained the primary mechanism. All three organisations relied on training to introduce and strengthen a variety of management skills (especially financial management). Only BT exhibited a clear skills supply strategy which was catalysed by two major restructures , and was supported by a variety of levers. Interestingly, both RSRE and IBM recently have restructured and support what appears to be a skills strategy, but not enough time has passed to satisfy the criterion of "consistent effort".

The transformation of the management style within BT was initiated through multiple changes in hard benefits in order to recruit, reward and retain private sector managerial talent. As a performance-related pay package, base salary was made less important while benefits and incentives became more important. Individualised personal contracts introduced pay secrecy and pay differences. Performance in relation to business objectives and future contribution to business success became the basis on which compensation would vary.

This compensation package was introduced at the top and was gradually pushed down to middle management, and some elements were introduced within unionised ranks. Initial impact was limited, but as the number of participants



increased and numerous BT veterans were exited, a new hard-nosed managerial style emerged. The transition saw a deterioration in the work environment and a sense of insecurity in the management ranks as longtime companions and colleagues were prompted to leave and career options in the changing organisation were unclear. As the new managerial style became established, it won the adherence of numerous lower and middle managers who appreciated the dynamic approach, and understood that their own careers depended upon obtaining a personal contract. Career success was noticeable more in the car that a person obtained than in their official title. This bottom-up pressure was welcomed by senior management who proceeded to include all of middle management in the new arrangement. Thus, the pacing of change was responsive to the emergent situation.

It is noteworthy that changes in hard benefits created a deterioration of certain soft benefits (career development and employment security). Management responded to the low morale by renewing career development which was presented as a "road map" to understand and progress within the new organisation. However, the deterioration in soft benefits somewhat corrected itself over time as managers came to redefine their relationship with the organisation. Performance-related pay was viewed as desirable and rewarding if you could join the club. In both cases, a clarification of exchanges took place, reflecting the human capital interpretation of the ILM (Siebert and Addison, 1991).

Management's inability to overcome union objections slowed down compensation changes in unionised ranks. This did not prove to be a serious problem because many managers and professionals wanted to join the select club. The small sums allocated to performance-related pay caused some dissatisfaction, but no

questioning of its legitimacy. The wide introduction of incentives (eg., profit sharing, quality awards) helped to keep the focus on the new business style and the real rewards that came with it.

Changing the management style in BT, as an organisation-wide change, affected the R&D Division. The strengthening of financial and project management skills within the R&D function relied on wide training over a number of years. Competitive bidding was strengthened in the late 1980s with the arrival of a new lab director externally recruited. Potential competition was introduced deliberately to improve added value and productivity in serving primarily internal customers. With the introduction of "competitive bidding", middle managers studied their area skillbase more closely and planned for development through recruitment, training and on-the-job development. Assembling strong research teams also meant pooling people across organisational boundaries.

Similar conditions in R&D were noted in all three cases. While competitive bidding and financial and project management skills were present in IBM throughout the 1980s, competitive bidding was introduced in RSRE with package management in 1990-91 while the other skills were strengthened starting in the mid 1980s. In all cases, the pooling of skilled researchers across organisational barriers was a very recent phenomenon. It would appear that the changes in BT management style were a complementary stimulus to the general industry trend of questioning the R&D contribution and controlling value-added (Whittington, 1991).

The above evidence strongly supports the existence of a SKISS linked to the strategic transformation of BT's management style. The skill supply pattern was introduced deliberately and management efforts were consistent over an eight

year period of time. However, the pace of change appeared to be emergent and depended on achieving a critical size in the new management culture and on overcoming union opposition. Rewards and career success within the firm came to be viewed as tied to the new management style. Changes in HRM components and in hard and soft benefits were coherent with the exception of career development. Changes in the latter took place as an emergent tactic to deal with low morale caused by the massive organisational restructuring taking place. While many employees wanted a sense of direction and progress in their employment, others understood that career within the flatter organisation was based more on performance than seniority.

Within the R&D area of our three organisations, there were other skill supply patterns as candidates for SKISS: attracting graduates in RSRE by increasing compensation (Candidate "B"); increasing the supply of critical skills in BT through decentralisation (C); and changing the mission at IBM-Hursley (D).

### **SKISS CANDIDATE "B": INCREASING GRADUATE RECRUITMENT SALARIES IN RSRE**

As part of the civil service, RSRE compensation and conditions of employment were set by Treasury which, in the early 1980s, introduced a new pay policy. Previously among the market leaders, the government now pegged compensation within the civil service to the average national labour rates for comparable jobs. At the same time, salary offers for graduates in key skill areas were spiralling upward in the IT industry. RSRE management found that they became disadvantaged in what they could offer graduates at the time of recruitment.



Meanwhile MOD, RSRE's main customer, continued to emphasize broad research excellence. Thus began the consistent upward pressure that RSRE management exerted on the Treasury to adjust graduate salaries upward. Ample justification was presented regularly, and little by little, RSRE management obtained the ability to place graduates on a range of base salaries. Other actions were also taken by lower levels of management to ensure that people had challenging work from the beginning of their employment. However these additional measures represented continuity with the past.

This simple skill supply pattern attacked a key component of recruitment (initial pay), critical from the perspective of management. It also demonstrates the isolation of RSRE management from the decision-making centre, and how constant upward pressure (1985-91) was exerted to obtain a key gain. Within this centralised structure and centralised planning, RSRE management reacted to inflexible pay policies but in a consistent manner. With the introduction of performance-related pay increments by Treasury in the late 1980s, RSRE management also had the ability to recognize outstanding performance, but this change of hard benefits was unrelated to increasing recruitment salaries.

This bottom-up and emergent strategy used only one lever and targeted recruitment, not retention. Recruitment also was addressed by well-established hard and soft benefits. The organisation's reputation for outstanding research and the promise of challenging work were important attractions. However, they represented continuity with the past, not a coherent package of changes targetting research excellence. In contrast with BT changes in management style, this skill supply pattern (isolated adjustment of the base salary) did not put into question the work organisation of RSRE and all that flows from it, that is, challenging work, positive work environment, and employee recognition.

One concludes that this pattern does not satisfy the criteria for SKISS. The link with business strategy is diffuse (control of salary budget versus research excellence). RSRE management actions were as much reactive as they were deliberate, and their consistent efforts were sustained by the continued presence of constraining centralised pay policies. While the HRM components appeared coherent, there was no concentrated effort to introduce other adjustments to improve recruitment.

### **SKISS CANDIDATE "C":**

#### **DECENTRALISED RECRUITMENT & OPERATIONS IN BT**

Another example of a single-lever pattern is the establishment of software centres in Belfast and Glasgow by BT. Corporate office saw the modernisation of its proprietary network as a critical part of a strategy to compete effectively in the soon to be deregulated telecommunications industry. Software skills were essential to exploit the digital capability of the modernised network for internal efficiency and for the creation of value-added services. Overdependence on the London market and the growing importance of software prompted management to tap other labour markets. Decentralisation of operations to Belfast and Glasgow permitted the access of labour markets with a relatively immobile workforce, and diminished the over-reliance on the Greater London market where the density of employers permitted high inter-firm mobility. The software centre in Belfast was opened in 1981 and in Glasgow in 1986, and were gradually grown over time. The success of Belfast encouraged the opening of a second centre in Glasgow. Local managers acted as entrepreneurs eager to build and expand their organisation, and put upward pressure to increase availability of

resources and to increase hiring. Consistency was demonstrated over a decade and addressed the skill shortage which affected the entire IT industry.

This top-down recruitment strategy involved geographic decentralisation and the existence of distinct parcels of work easily coordinated and integrated across distances. Both recruitment and retention were important to maintain the growth rates of these centres. Quality of the community was the principal soft benefit and issue addressed. The other critical soft benefit was the positive work environment created by the managers attached to and recruited for these centres. The growth phase of these centres were managed in an entrepreneurial style with strong bonds forming among the professionals and the managers. The enthusiasm and caring attention of the managers was manifested in all of their HRM activities. This managerial activity became a bottom-up push to acquire more resources and work for the centres.

In this case, three criteria for SKISS were satisfied: there exists an evident link with the business strategy (modernisation and competitiveness); senior managerial intentions were deliberate; and managerial efforts were consistent over a decade. The criteria for coherence also was satisfied, but was achieved by local management actions which targetted rapid growth of the centres. This entrepreneurial style was valued by the researchers and set the pace of change. This bottom-up emergent phase developed rapidly as part of the operations of the workplace. As in the case of BT management style, we see an emergent process which determines the pace of change after the initial strategy implementation.



**SKISS CANDIDATE "D":**  
**HURSLEY SOFTWARE MISSION**

IBM had made slow progress in penetrating the lucrative markets of software and computing services in the 1980s. In the late 1980s, corporate office tried to accelerate the redeployment of resources to obtain a larger share of these markets. In 1989, corporate office decided that Hursley would adopt a 100% software mission with a focus on communication systems. The following year, the drop in revenues meant that downsizing would take place. The plan for Hursley was for redeployment and early releases with careful attention to keep those people with skills supporting the new mission. The Lab's managers were mobilised to restructure the Lab with a concern for skills. In terms of levers, work reorganisation through redeployment, and skill-sensitive releases were applied.

The software mission introduced in 1990 benefited from the greater integration of the Lab's hardware areas with the manufacturing plants. It became realistic to spin-off these areas and merge them formally with the plants. The structural separation was opportunistic and emergent, and fit well with the preoccupation to increase IBM's activity in software. The absence of hardware missions proved to be very beneficial for the rapid mobilisation of management around the software mission.

A business downturn and a productivity push the following year (1991) prompted Hursley management to introduce a variety of interventions within a downsizing environment. Little or no recruitment was accompanied by some outflow from the Lab and by massive redeployment within the Lab. Recruitment and internal movements were carefully controlled to support the new mission; career

development was oriented towards business requirements. At the same time, relatively autonomous teams were introduced experimentally to increase productivity and skill levels.

The strategic push in IBM for greater productivity made explicit use of several skill supply levers with the main ones being recruitment, controlled internal movements, focused training and work organisation. Coherence of HRM components and clear linkage with the business strategy (software mission) were evident. Corporate management deliberately sought to exploit the skill strengths of the Lab in communication systems. As for the fourth criteria, no opportunity was available to demonstrate consistent management effort beyond two years because the Lab's software mission was launched recently. Caution appears appropriate in that IBM remains a sophisticated organisation that in the past periodically made skills a "strategic" concern only to have these interventions disappear or serve limited purposes.

This top-down skill supply pattern modified soft benefits only. Because of the short lapse of time, we cannot report on whether there was a subsequent bottom-up response. The initial top-down phase was protracted and accelerated dramatically in 1991 as part of the wider IBM crisis. Interestingly, the software mission was preceded by the protracted separation of the hardware missions and activities, a primarily emergent process.

### **SKISS AS AN EMERGENT PROCESS**

The two skill supply patterns which passed the SKISS test both began as a top-down intentional process, and followed eventually with upward pressure by

middle management to adjust the strategy, in particular, the pace of change. Where the effort was organisation-wide and involved repeated restructuring (BT Management Style), the upward pressure was slow to develop. In contrast, the R&D specific change (BT Decentralisation of Recruitment & Operations in R&D) the initial top-down phase was followed quickly by bottom-up pressure from middle-managers adopting an entrepreneurial management style. In both cases, the emergent phase had high middle management involvement. Schilit (1990, 1987) reported similar results in the U.S.: middle managers were more likely to influence the strategic process at the implementation stage through rational persuasion, persistence, and their image of critical expertise. Wooldridge and Floyd (1990, 1992) also found that these managers actively identified strategic problems and proposed solutions. Our findings resemble Kanter's (1983) change masters who exercise political skills to create incremental innovations in products, work methods and structure. However, our findings clearly designate middle managers as the agents of change.

The existence of an emergent phase in SKISS supports the positions taken by Bulter (1988) and Wright and McMahan (1992) in their modelling of strategic HRM. The two examples of SKISS, both taking place within BT, resemble more a socio-political process, rather than a rational or bounded rational process (Eisenhardt and Zbaracki, 1992), with self-interested middle management influencing the pace of change through their control of the operationalisation of the business strategy.



## **SKILL SUPPLY PATTERNS & THE OUTER CONTEXT OF THE ORGANISATION**

Actual or potential competition and "perceived competition" provoked a multi-lever skill supply pattern in both BT and IBM-Hursley which involved broad changes in organisational structure and management systems. In contrast, a relatively steady outer and inner context, with the exception of labour market pressures, was noted for a simple, single-lever pattern of adjustment such as decentralised recruitment and operations, and recruitment salary adjustment. One concludes that competitive pressures in the environment are triggers to multiple changes within the inner context of the firm which in turn create a new multi-lever pattern of skill supply. Labour market changes alone provoke little change, and are dealt with by single-lever skill supply solutions. This conclusion coincides with the dynamic training model proposed by Pettigrew et al. (1989) and the findings of Hendry et al. (1991). Note that in all cases, pressure for change was sustained over the decade.

### **EMBEDDED NATURE OF SKILLS STRATEGY**

Having argued in favour of SKISS as a relevant concept for large high technology organisations, the researcher admits having had difficulties in recognising the pattern. The evidence for a intended, coherent and consistent plan and programme of change in skills supply was not easily gathered. Most of the managers interviewed had to be prompted repeatedly to discuss the strategic importance of skills. They lacked a vocabulary to articulate their skill needs and concerns. They often relied on indirect indicators of skill such as formal education, experience with a particular technology or computing language, and

project management experience in a specific area. They discussed skills indirectly by attending to the work organisation and by their frequent reference to the need to grow skills. One is reminded of Hendry's (1993) caution that managers have difficulties in abstracting themselves from the operations of the organisation.

While the evidence for SKISS within BT was the strongest, all three organisations seemed to be on the threshold of a clearly recognisable SKISS. Three interpretations come to mind. First, we could give them the benefit of the doubt and hope that several years hence a consistent effort will be evident. Second, we may argue that, in the same way that HRM as a strategic activity is a relative newcomer to British organisations (Storey, 1991; Hendry and Pettigrew, 1986), SKISS is indeed a new activity. Whether it thrives or not may be linked to the general fortunes of the HRM "movement". Third, the evidence of the periodic rise and fall of skills planning and systems within IBM, the most sophisticated of our three organisations, suggests that SKISS can be thought of as episodic, that skill issues rise to the surface of the management agenda as an episode. Once a solution is found and implemented, strategic attention to skills disappears.

The third interpretation points to the difficult topic of embedded and tacit skills which pervade the organisation. While specific skill requirements may be provoked by external circumstances (skill shortages, new customer service), the chosen solution quickly becomes part of the existing work organisation and systems, and becomes relatively invisible. The episodic nature of SKISS operates from a background of regular attention to the embeddedness of skills. Thus the apparently discontinuous attention to skill issues masks the on-going adjustments of the work organisation where a skills-related topic, such as technology and management systems, predominates.

With major restructuring, work reorganisation takes place and attention to skills is heightened because the skills context itself is being modified. The evidence of the three cases supports the importance of restructuring as a trigger that obliges managers to focus on skills. The new structure calls for new ways of organising the work and achieving productive performance. Managers use explicit though simple notions of skill, and continue to refer to the work context to make their discussions relevant.

The tacit foundation of skilful problem-solving and innovation operates at the individual, group, and larger unit. At the organisational level, we may speak of firm-specific assets. Evidence in our three cases documents the nature of tacit skills in the R&D environment. A continuum of embeddedness was found. An example of low embeddedness is where an external organisation is given a piece of work with standards to achieve. The knowledge and skill becomes codified in the product, but the Lab must still incorporate the product into a larger process leading to a larger product. A higher level of embeddedness was present when contracted experts were brought on-site to work with regular employees. This has the advantage of equipment availability and diffusing some of the external skills through close collaboration. While the collaborators are expected to adopt the expert's ways of working, the expert must learn to adapt to the organisational setting and management systems.

An even higher level of embeddedness can be attributed to the regular practice of formal and on-the-job training of regular employees who are subsequently expected to incorporate their new skills into their work routines.

Tacit Computing Skills. In his visits to R&D sites, the researcher witnessed relaxed conversations of groups of two researchers on the work taking place on



their respective screens. Occasionally, one of them would peer over the other's shoulder, either in response to an invitation or unsolicited. Brief exchanges appeared common. In the IBM lab, groups of four persons were seen discussing avidly around a screen. Thus, at the group level and aside from formal meetings, interactions were free-flowing, but framed by the active computing screen and its setting (Zuboff, 1988; Beanstein, 1975).

Managers in all firms frequently referred to the importance of growing research skills internally. Generally researchers stay within a given area for several years to become expert. Movement among groups in the area take place as project requirements vary as individual interests develop. Movement outside of the area is less common, and reflects the importance of the common skill context built through the nature of the work and the personal networks. Within IBM, the recent work organisation experiments prompted management concern that people may have difficulty moving among the distinct work settings.

Group embedded skills were prevalent in a variety of situations. The traditional group was characterised by propinquity and a strong sense of achievement motivation. RSRE discovered that disbanding such a group and reconstituting it at some later time, when funds were again available, meant that the group was unable to attain rapidly the high performance previously achieved. The tacit skill foundation was easily disrupted but not easily recreated even with most of the same people present.

Physical proximity (or some approximation) appears to be essential for creating skill depth. However, once achieved, it becomes possible to expand the skill use with a larger dispersed group or network of groups. Yet IBM found that rapid start-up of a new team on mainframe operating interfaces was difficult when the

entire group did not begin at the same time. Sending three professionals to the U.S. for initial collaboration was of little benefit for subsequent team members who continued to lag behind in levels of performance.

In our three cases, there existed a high awareness of the importance of computing skills in the R&D area, though articulation in strategic terms remained poor. At the same time, a production orientation has been introduced, with more emphasis on channelling innovation for greater productivity through the explicit techniques of project management. Recently, an overlay of marketing control has been introduced. These control systems have tried to standardize the research process, and in doing so, have created new skill requirements which are explicit and more amenable to control (Winters, 1987).

Tacit Managerial Skills. BT's strategy to increase private sector managerial skills over an eight year period demonstrates an effective (though slow) method of reorienting the management team. In the opinion of this researcher, the recruitment of these skills from the top-down translated into a slow process of change partly because the new managers were not understood by many of the BT career managers who continued to operate in the old political culture of judicious "disobedience". A significant impact was made only with the exiting on many of these resisters and the accumulation of a large group of external recruits. The scale effect of the latter was important for BT managers excited by the changes but requiring models of private sector individual and group behaviours to modify profoundly the skillbase that hitherto had guided their actions and interventions.

IBM presents another interesting example of the robustness of the managerial skillbase. Despite the repeated signals from a business environment growing more dangerous, IBM managers seemed unable to modify their traditional, slow

and complex decision-making process where internal negotiations and persuasiveness played a large role. This inward-looking culture was fostered by decades of dominance in the computer industry where IBM set the standards. External recruitment was not accessed because it would have been a violation of lifetime employment and the internal career development that renewed the management ranks. The case of BT differed in that the changes in competitive environment were clear, dramatic and according to the government timetable.

Tacit Networking Skills. The reality of R&D in the three high tech organisations studied resembles that of a network of organisations and persons closely integrated, with many outside participants playing an essential business role not easily substituted. International in scope, R&D benefited from joint ventures with firms, institutes and university labs. IBM also has an extensive internal network of laboratories and science centres within which knowledge transfers take place.

Within the U.K., the above international dimension was evident. But all three organisations also called on consulting firms to tap skills in critical shortage. Generally demanding ever higher compensation, these experts could not be attracted by the average wages of leading firms offered by these organisations, hence their regular though limited use under tailored contracts.

Both RSRE and Hursley Lab contracted out for convenience, RSRE to keep the more interesting basic research work for its permanent people, and Hursley to meet project requirements on an ad hoc basis. In both cases some managers thought that such skills should be within the core workforce, but that other considerations weighed more heavily. Recruitment flow also took place between the organisation and the contracting firms. Current employees could join a



consulting firm and offer their services back at higher rates. Similarly, contracted help was a recruitment source for permanent positions within the organisation.

We conclude that within the U.K., the R&D network involved the external labour market to access scarce skills but also to support a variety of short-term business and people management goals. The idea that a network would encourage a strategy for managing the skills supply of the "expanded" organisation was not supported. The absence of an expanded SKISS echoes the difficulties of recognising a SKISS within the more traditional boundaries of the organisation.

## **CHANGING THE OPERATIONAL CONTEXT**

Our findings suggest that changing the operational context (including the work of R&D) of an organisation takes place over a protracted period of time. The relationship between the pace of change and the operational context has additional significance in that tacit skills are embedded in the work organisation. The introduction of a single-benefit pattern of skill supply does not disturb the skillbase, whereas a multi-benefit pattern does so. The passage of several years may be required to modify the skillbase and its context in a controlled manner. At some point modifying the skillbase becomes accelerated and deliberate as part of restructuring. These findings are consistent with those of Pettigrew and Whipp (1991) in that linking strategic and operational change was complex, additive and characterised as both an intended and emergent process. Our findings demonstrate how adjustments in hard and soft benefits contribute to the process. In contrast, Pettigrew and Whipp presented modifications of the reward system as a secondary mechanism which builds on primary conditioning features,

notably building capacity for appropriate action. In our example of modifying the managerial style within BT, changes in hard benefits acted as a conditioning feature by assisting in the recruitment and the building up of a critical mass of new managers with a new vision. The relationship between conditioning features and secondary mechanisms appears to be highly permeable.

The upward influence of middle managers in R&D refers to the type of linkage between technology and strategy proposed by Itami and Numagami (1992). They argued that emergent cognitions about the existing technology operating could guide future business strategy. The authors described how deep knowledge (both articulated and tacit) in a particular technological area stimulated the generation of ideas which would cluster around a common base of knowledge, and could lead to well articulated strategic proposals. Our findings point out that part of the process of nurturing and sustaining this evolving skillbase takes the shape of managerial cognitions on how to exploit existing and developing technologies with the researchers at hand. These cognitions lead to measures which middle managers take to shape the existing professional and managerial skills within the organisation.

## CONCLUSION

Of the four skill supply patterns evaluated, only Modifying BT Management Style, and BT Decentralisation of Recruitment & Operations within R&D, fully satisfied the four criteria of SKISS. It is not surprising that RSRE failed to achieve a SKISS given its dependent status within the civil service and MOD. It is more curious that IBM-Hursley lacked a SKISS. Operating within competitive markets and possessing a large internal market, IBM had the opportunity to



seek competitive skill advantages for its R&D. Our findings suggest that the market dominance of IBM in the 1980s encouraged an inward-looking culture where management became insensitive to market signals. However, in the 1990s, the "awakening" of management and the consequent Software Mission at Hursley did stimulate a SKISS-like pattern. Intense competition and management cognitions on the urgency of the situation appear to be the critical features for the creation of a multi-lever SKISS.

Of the four criteria, the most difficult to satisfy was that of coherence of HRM components. This criterion appeared to involve an emergent process which sometimes addressed the strategic skill initiatives and sometimes dealt with secondary effects or with unrelated matters. The fact that the HRM context (discussed in Ch. 8) involves many features may explain the difficulty of achieving a skills-oriented coherence.

The evidence supports the view that research skills in high technology organisations are deeply embedded in the operational and social features of the work context. Lower levels of management naturally pay attention to the management of individuals and work groups under their immediate supervision, but until recently, middle managers also spent considerable time in managing these local efforts and paid less attention to division-wide issues. Top-down strategic thrusts do not immediately and automatically bring middle managers on side unless there are structures which ensure their involvement. The embeddedness of management skills means that any top-down effort for radical change encounters resistance of the management group, partly because their cognitions and behaviours are anchored in the existing operational context, and partly because their self-interest may not be served well by the intended changes.



Until they can make the corporate strategy their own, middle managers will slow down the pace of change.

Because of the embedded nature of skills, the strategic concept of core competencies proposed by Prahalad and Hamel (1990) is found wanting: they emphasised corporate-wide skill synergies, but minimise the involvement of business units and lower levels of the work organisation. Klein et al.'s (1991) concept of core skills comes closer to capturing the embedded nature of skills in relation to equipment and organizational culture. Klein believed that the skillbase underwent continuous change as part of innovation and learning. In other words, the skillbase is built from the bottom-up in the on-going management of the professionals. We would add other skill supply levers besides challenging work which can influence the incremental adjustment of the skillbase.

The embedded nature of skills makes it difficult to achieve a SKISS because modifying the operational context requires tremendous energy to deal with this level of complexity and maintain the effort over time. Episodes of skill concern are more likely. As suggested by Winters (1987), heightened skill awareness helps to make some skill aspects explicit and more manageable. In order to sustain the effort, much has to be at stake and ample resources must be brought to bear on the situation. The introduction of private sector managerial skills at BT is such an example.

One wonders under what conditions would a multi-lever SKISS become possible in R&D where operational and social features anchor the skills. Our findings indicated that middle management was concerned about transferable skills for the purpose of redeployment and the creation of project teams. They were also

interested in building skills that took time and group stability. We can surmise that while managers focus on both issues (transferability and building), these efforts would become a SKISS if and when middle management shared in the process of strategic formation and nevertheless remained grounded in the basic work organisation.

## **CHAPTER 8: SKISS & ITS HRM CONTEXT**

In Chapter 7, the four criteria for SKISS covered two dimensions of analysis: the content of change (business strategy link and coherence of HRM components), and the process of change (top managerial intent and consistent efforts). The concluding section began the task of interpreting the findings by adding the dimension of context. The importance of intense competitive pressures in the outer context was considered a necessary (but not sufficient) condition for developing a multi-lever SKISS. Features within the inner context (e.g., managerial culture, organisational structure) of the organisation could channel these pressures to create a SKISS or could resist change, thus favouring the established policy of lifetime employment.

In this chapter, the influence of the HRM context on skill supply patterns is evaluated fully to complete the analysis of change using the contextualist framework outlined in Chapter 2 and applying the concept of SKISS as a focal point surrounded by the larger HRM context. HRM is discussed in terms of the policy of lifetime employment, top management values and perceptions, managerial and professional cultures, the personnel function, and workforce planning. Hard and soft benefits attached to these HRM features are discussed. The chapter ends with an assessment of the features of HRM as facilitators and inhibitors of SKISS.

### **LIFETIME EMPLOYMENT UNDER ATTACK**

In all three cases the dominant skill supply pattern was a long-standing corpus of policies and practices built around the lifetime employment philosophy. Key



elements included consistently low levels of recruitment of the best graduates, high levels of training, workforce headcount control, voluntary exits, redeployment and retraining, and a significant peripheral workforce. Hard benefits included competitive entry salaries for graduate recruits, low risk, high internal equity, and rich pensions for mandatory and voluntary retirements. The main soft benefits were a steady stream of challenging work, positive work environment, enriched training, employment security, promotion from within, and continuity of community (job transfers to nearby sites without disrupting community links). Each firm had a recognizable internal labour market (ILM) composed of managers and professionals with some segmentation by function and division. Some authors have argued that this pattern constitutes a skills supply strategy, called the Salaried Pattern by Osterman (1987) and Lifelong Employment by Beer et al. (1984). In our cases, lifetime employment maintained the dominant pattern of skills supply, but in the 1980s and 1990s, it constituted a tradition of well established practices resistant to change.

Within the R&D division of our three cases, lifetime employment was considered very important in order to develop researchers over long spans of time. This was crucial in RSRE which operated with horizons of up to ten years. All organisations were confronted with skill shortages for experienced project managers and professionals in all areas, and especially in the networking and advanced computing areas. All organisations relied on external recruitment and the development of project managers internally for computing and networking. Redeployment and retraining took place to some degree to grow these new areas, but the pace was slow and was opposed by researchers wishing to remain within their preferred field. The coordinated use of recruitment, training and development was the continuation of best practice, and did not have strong links

with business strategy. However, restructuring in 1990s by BT and IBM was accompanied by greater skill awareness and measures to address skill concerns.

Private Sector. Large high technology firms were noted for the lifetime employment pattern. IBM adopted the pattern in the 1950s, but contrary to the public sector, it included individual contracts with performance-related pay for all of its employees. Lifetime employment was offered with the clear understanding that employment security was offered, not job security. Effective deployment and redeployment of the workforce required people and skill flexibility. Within IBM, lifetime employment was a corporate philosophy based on the belief that full commitment of people was only possible from people who saw their future and careers as linked to the fortunes of the firm, and whose dignity was respected by the firm. Employee flexibility was expected.

In the 1980s, business critics and shareholders repeatedly challenged the appropriateness of lifetime employment for the battered IBM, and senior managers continued to defend the pattern as responsible for IBM's past successes and a necessary part of future successes. But as IBM's fortunes declined, senior management clarified their support. The possibility of mandatory redundancies continued to surface. By 1991 the basic pattern remained intact but had been chipped at the edges. Voluntary redundancies targeted younger persons and reached some people in their early forties. Term contracts were offered to graduates instead of permanent contracts. These incremental changes addressed short-term issues provoked by the business downturn and the age profile of the firm.

Public Sector. Lifetime employment or tenure was introduced in the civil service in the 19th century as a solution to patronage. By removing the fear of job loss



and institutionalising competitive and open recruitment, it became possible to create a professional workforce with on-going training and development, and promotion from within. This pattern has been maintained with few changes in a hundred years. It was extended to the growing civil service, and covered both RSRE and BT. What originally started as a coherent and intentional SKISS became an institutionalised pattern. Only in the 1980s was there growing pressure to modify this pattern. The rise of Raynerism and efficiency concerns led to the privatisation of crown corporations, and subsequently the creation of executive agencies in the late 1980s. The impact on RSRE was slow and incremental, and led to a customer-focused budget system which prompted a reorganisation and had some impact on skills. Computing and networking skills gained in importance, and basic scientific disciplines decreased in importance. The Defence Agency was created in 1991, and was expected to radically change operations and the basic employment contract.

In the 1980s, lifelong employment had become somewhat maladaptive for RSRE as it struggled to attract and retain researchers with scarce and key skills. As part of the wider civil service, RSRE management did not control fully the HRM levers which were conceived for service-wide equity and the development of broad professionals. Similarly, BT was immersed in this tradition as part of the Post Office. With the privatisation of BT in 1984, lifetime employment was viewed by senior management as an impediment to transforming the organisation from a public to a private concern. BT also lost the obligation and role of good employer portrayed by the civil service. It was now free to choose its values, and the push of competition and regulation encouraged viewing the workforce as a cost. External recruitment from the top-down in the management ranks violated the pattern, and the introduction of individual contracts based on performance-related pay emphasised the new orientation.



It is interesting to note that performance-related pay did not prove to be the mechanism for exiting managers unable to cope with the new management style. Instead, "resisting" managers were persuaded that the new structure had no place for them and that early retirement was appropriate.

In the late 1980s, senior BT management expanded the theme of private enterprise and competition to include a basic modification of the employment contract for all of its employees, that is, "no more employment for life". While the new theme was repeated consistently, radical downsizing only took place in 1991. Clearly the unions had a moderating effect on contract adjustments for both management and professional/technical ranks. Mandatory redundancies were entertained by senior management, but were never realized. However, voluntary redundancies for people in their forties did take place.

Conclusion. We can draw the conclusion that lifetime employment is under attack in the 1990s, and contrary to the recommendations of Consensual HRM (e.g., Beer et al., 1984; Keep, 1991), this core policy is being weakened. The past dominance of lifetime employment has meant that the key levers to influence skills supply were relatively unavailable to other supply efforts. Any changes in the key levers (recruitment, training, development, and exiting) and key benefits would be questioned as either appropriate or not appropriate in light of this key policy. Whereas Beer et al. (1984) and Keep (1991) proposed lifetime employment as an essential policy for organisational success, our findings emphasise its maladaptive feature in an environment of growing turbulence, and its blockage of needed changes.

Lifetime employment was supported by the view that HR assets were important and improved with time if consistently and broadly developed. In the public sector (RSRE and BT), it was believed that employment security ensured professionalism by removing unemployment fears and giving employees the right environment to invest in their skills. Professional expertise was highly valued in a changing and modern world. Within the private sector (IBM), employee security supposedly guaranteed high employee commitment and a willingness to grow and adapt with the firm.

The attack on lifetime employment was taking place at the same time as the convergence between the public (BT and RSRE) and private sectors (IBM) with the former copying the latter, especially in the greater emphasis on incentives and performance-related pay. Yet each organisation confronted a different context and responded differently over time. RSRE changed very slowly in keeping with centralised programs. With performance-related pay and personal contracts already well established, IBM introduced incremental changes as of the mid 1980s in response to deteriorating business performance. BT explicitly recruited and retained private sector managers by adopting a compensation package mirroring the current practice in the private sector.

With the greater involvement of line management, RSRE and BT were exploring ways of offering competitive salaries for recruiting and retaining people with key skills while maintaining global control of the workforce budget. Interestingly, market sensitive salaries could be higher or lower than average national wages. Management was willing to trade-off internal consistency for recruitment and retention advantages. IBM, on the other hand, adjusted to self-imposed recruitment controls in the 1990s by expanding the use of fixed-term contracts with graduates so as to maintain the supply of key skills.

The policy of lifetime employment was under pressure in the 1980s (BT and IBM) but was strongly supported by the HRM context. This policy served the interests of several groups, and was consequently defended. However, support did diminish somewhat as small and additive changes in certain features took place, namely, within top management and the professional and managerial cultures, and within the personnel function.

### **TOP MANAGEMENT VALUES & PERCEPTIONS**

In all three cases, top management traditionally supported the lifetime employment pattern. Individual managers toyed with the idea of operating as a "lean and mean machine". These musings gave rise to no concrete action, but they indicated that management saw definite advantages to subordinating people concerns to business concerns. Only in BT did a SKISS take root to introduce private sector managerial skills at a fast pace with external recruitment and exiting of resistors. Once freed from government ownership, the executive and board of directors used their concentrated power to sustain the renewal of the management ranks from the top. With local, national, and international competition clearly on the horizon, a small group of top managers (about one third of the board) were convinced that a new management style was critical to future business success. Breaking with the past, they proceeded to minimize internal senior promotions, maximize external recruitment into their ranks, and increase early retirements.

Within RSRE and IBM, top management was noted for continuity and inbreeding. Their set views were obstacles to broad changes which questioned their tenure and their prospects for promotion. RSRE top managers originating



from the applied physics area continued to insist on the pre-eminence of applied physics over information systems despite growing customer dissatisfaction and the industry trends. IBM top management remained captive to the entrenched managerial culture of shared decision-making and change champions reinforced by the commitment to lifetime employment. IBM careerists dominated the top, supported only small incremental changes to business strategy and practices, and continued to share in the belief of market dominance as their destiny. As late as 1992, consistent increases in competition and poor business performance were not sufficient to stimulate a new vision. The focused software mission at Hursley Lab was a difficult admission that IBM lagged in offering computing services.

The above analysis suggests that only when top management perceives competitive pressure as overwhelming (with some prodding from discontented stakeholders) can it initiate a paradigm shift and subsequently introduce a multi-lever SKISS to modify the skillbase over time. The BT example demonstrates how the new frame of reference makes it possible to drive change over a decade in the face of high resistance of senior (and middle) managers who saw their interests satisfied in the status quo.

## **PROFESSIONAL & MANAGERIAL CULTURES**

Two dominant cultural mindsets were evident: professional excellence, and business performance. As high technology firms with important R&D activity, management considered the excellence of their professionals as essential for business success. Excellence achieved through depth of expertise could only be fostered over long periods of time assuming recruitment from among the best. Thus employment commitment through the lifetime employment pattern was considered appropriate.

From the perspective of professionals in the early 1980s, this approach was very satisfactory. Traditional scientific researchers wanted a secure environment in which to pursue their research interests and become expert in a specific area. Becoming managers was also satisfactory because the persons would remain in the same area and would continue to have some involvement in the "lab".

The significant change in the 1980s was the rising dominance of computing and networking over engineering and the basic sciences, and increasing customer demands for these new specialties. The maturing of computing science made it difficult for existing employees to outperform new recruits who could contribute significantly to customer responsiveness. Also, computing people generally were more comfortable with a business orientation involving customer contact, and letting the business potential of technology rather than theory or technical wizardry guide the research agenda. While customer pressures favoured the ascendancy of IT skills over engineering and physics-based skills, the historical dominance of the latter group slowed down efforts to reshape the organisational skillbase. Within RSRE in particular, the cultural conflict gave rise to serious under and over-staffing problems.

With stiff market competition for these skills, new supply patterns were sought, but reliance on graduate recruits and some redeployment continued. The growing number of software professionals within the organisation helped to create a positive environment for customer responsiveness. While BT underwent a gradual reshaping of its workforce in favour of software skills, both IBM and (potentially) RSRE underwent rapid reshaping in the 1990s in response to mission and status changes. In all cases, competitive pressures and the need for greater productivity stimulated managers to evolve a hybrid view of professionals

as both excellent and business minded, a trend noted by the the British Computer Society (1990). At the organisational level, the appearance in the 1980s of hybrid technical and managerial roles in R&D has coincided with the shift from professional and bureaucratic/managerial forms of control to market control within U.K. organisations (Francis and Winstanley, 1988; Whittington, 1991). In effect, a power shift has taken place from researchers to managers which has left traditional researchers and managers uneasy.

Scarbrough and Corbett (1992) have argued that the commitment to knowledge and innovation becomes diluted by the new and somewhat incompatible commitments to business performance. This incompatibility of orientations does not appear to be a problem for younger professionals and managers and for those working in the applied areas where short-term horizons and customer contact are common and where the technology itself guides the research agenda through "playing with the computer". A hybrid role has emerged characterised by broad responsibilities with less distinction between business functions. These new roles have been a difficult transition for some as new cognitions are needed on the nature and purpose of research. This cultural change was accompanied by new expectations by researchers on appropriate hard and soft benefits for high performance and for their presumed value on the labour market. In keeping with this change at the professional and lower management levels, middle managers began to shift to a broader notion of performance closer to organisational capability and business strategy, and consequently, closer to managing a wider skillbase.

From both perspectives (research excellence and business performance), R&D management viewed skills through the "lens" of work performance - a focus on achieving desired results. The growing emphasis on business performance has



diminished the importance of innovation per se and increased responsiveness to customer and market requirements which may or may not require innovative work. The greater articulation of performance outcomes has encouraged managers to focus on the usable skills of the researchers instead of solely on research efforts and long-term potential, and to use more performance-related benefits to achieve these outcomes.

### **INCOHERENCE OF HARD & SOFT BENEFITS**

The greater emphasis on business performance guided many of the change in hard and soft benefits. At the same time, downsizing requirements and skill shortages also prompted changes in benefits. However, these isolated changes were constrained by the policy and practices of lifetime employment and other traditional practices (e.g., individual accountability). From a skills management perspective, hard and soft benefits can play a significant role in the recruitment and retention of employees. However, the cases revealed that changes in these benefits sometimes served skill purposes and sometimes other purposes. These cross-purposes made HRM coherence around skill issues difficult to achieve and maintain over time.

### **HARD BENEFITS**

In keeping with the positions of Milkovich (1987), Bamberger et al. (1989), and Balkin and Gomez-Mejia (1990), compensation was found to be central in the recruitment of high tech employees in our three main cases. However, our results give qualified support to their argument that compensation is crucial to retention. These authors reported that a compensation package demonstrating

market leadership and flexibility played an important role in the recruitment and retention of key employee groups in start-up firms and growth-oriented business units. Our three organisations contained growth-oriented units, but retention was achieved through a competitive compensation package and pension penalties for early departures. These organisations experienced low levels of turnover (less than 5%) and practiced lifetime employment. A competitive compensation package was maintained by regular adjustments, but market leadership was not the desired standard. Equitable treatment of professionals was more important than flexible rewards, though the latter was growing in importance. We concluded that adequate hard benefits act as a necessary but not sufficient condition for retention upon which soft benefits build attachment. This conclusion resembles the work of Herzberg (1968) with hygiene factors (e.g., money) and motivating factors (e.g., recognition), but does not correspond in detail with his classification (see Wilson and Rosenfeld, 1990, for criticisms of this theory). Consistent with Sparrow's (1988) findings, performance-related pay was introduced extensively. However, innovative compensation and inducements found in relatively small fast-growth entrepreneurial U.S. firms (Miljius and Smith, 1987) were not practiced. In particular, group-based bonuses (Gomez-Meija and Balkin, 1989) were absent despite our findings that researchers preferred them and that groups were the basic work unit.

The literature on high technology organisations has given little attention to pensions. The on-going creation and growth of small entrepreneurial firms has kept the focus on ways of recruiting and retaining mobile high flyers, and graduates and experienced professionals in the face of external labour shortages (Kleingartner and Anderson, 1987). It is reasonable to assume that only surviving firms launched in the 1950s and 1960s have had to address the issue of older employees as both the firm and its employees have matured together. In

our three cases, large mature high tech firms benefited from low turnover rates. As part of downsizing, removal of penalties for early departures and significant lump-sum payments were necessary to stimulate voluntary retirements. These practices are found among large firms throughout the economy (Schell et al., 1989).

## **SOFT BENEFITS**

Challenging Work meant that professionals had the opportunity to use their skills and had the discretion to choose the specific work done. Within R&D, this benefit has been widely cited as essential, echoing the position of Raelin et al. (1985), Miller (1986), and Miljius and Smith (1987). Kanter (1985) and Schuler (1986) have emphasized intrapreneurship as the challenge that high flyers are searching for. There was evidence of such in our cases, but typically the activity was integrated with the other work.

Positive Work Environment was considered very important, and composed of two elements: friendly, supportive and talented colleagues, and supportive managers (Turbin and Rosse, 1990). Colleagues played a crucial role in making the work more stimulating through group work and personal networks. Managers helped by guiding researchers in defining their research projects so as to obtain organisational support and by protecting them from administrative tasks and worry.

Recognition for Employee Contributions was another important retention mechanism, confirming the findings of Miljius and Smith (1987). Researchers and managers thrive on recognition of their skills and accomplishments. Failure to obtain recognition is equivalent to being de-valued and can lead to exiting the



firm. These organisations were multiplying the ways in which recognition could be given.

Enriched Training for professionals broadened and deepened their skills and kept them current (Turbin and Rosse, 1990). Both formal and on-the-job training were valued. Training was considered helpful to career development, but usually the linkage was weak. Ample rather than focused training was typical, but a shift to the latter was taking place.

Teleworking was valued by some managers to retain female software specialists. But it was practiced by few, contrary to the growing trend reported by Sparrow (1988) and Yeats (1987).

Informal Listening by managers helped them to identify morale problems and to address sources of dissatisfaction before they became serious (Sherman, 1986; Parden 1981). Retention of employees was an explicit concern.

Formal Listening Systems such as opinion surveys and interviews were used to gauge employee satisfaction and identify sources of dissatisfaction (IBM and recently BT). The need to measure morale and its consequences were the driving force.

Employee Involvement through communications was meant to improve morale and commitment to the firm. Researchers have argued that when management regularly shares information on the changing business strategy, its implementation and adjustments, employees respond constructively (Salancik, 1977; DeCotiis and Summers, 1987; Miller, 1986; Raelin et al., 1985).

Employment Security was valued by employees, especially those over 35-40 years of age. Management was becoming aware that the younger generation had a relatively short horizon in mind (4-5 years) when seeking security. Also, assertive private sector managers (BT) saw their own security as anchored in their skills and accomplishments, not necessarily bound to one firm.

Career Development gave people a future orientation with the organisation. Though researchers are agreed on the importance of this benefit to retention (Miljius and Smith, 1987; Sparrow, 1988), our cases gave mixed support. Career development and its management had repeated cycles of improvement and degradation, and were given more attention when morale sagged. Concern was centred on performance first and retention second.

Successful and Responsible Image of the firm was widely appreciated, as noted by Yeats (1987) and Cascio (1990). Morale was at issue. Though both RSRE and BT tried hard to improve their image, IBM accepted some deterioration in order to emphasize the crisis in which the firm found itself in the 1990s.

Quality of the Community. Geographic proximity of multiple sites made employment transfers and forced relocation possible without disrupting community links. Yeats (1987) found that employees often chose to leave the organisation rather than move to a new community. Participants described quality of the community as involving family, friends, schools, leisure activities, attractive surroundings, weather, and cost of homes (Turbin and Rosse, 1990; Cascio, 1990). Being married and owning a home were considered strong retention elements. Many employees have a holistic view centred on their person instead of the firm. While managers recognise this new view, they treat the non-work component as either a constraint or a chance facilitator of recruitment and

retention. Several authors have broadened the notion of career to include both work and non-work spheres of activity in response to life phases (Levinson, 1978), multiple needs (Schein, 1978), diversity of views and peoples (Deer and Laurent, 1989; Weick and Berlinger, 1989), dual-career families (Sekaran and Hall, 1989), and the growing importance of women in the workforce (Gallos, 1989; Marshall, 1989). Management practice appears to be reluctant to adopt this broader view of career which gives less attention to the organisation.

In general, changes in soft benefits took place for retention of key skills rather than for recruitment advantages in a context of employment insecurity and generally low morale which potentially could impact on performance. Within BT, retention of key skills explicitly centred on fresh graduates. R&D had some concern about supply in the 1990s, and internal surveys had indicated dissatisfaction among the graduate employees. In order to ensure retention, a coordinated programme was introduced including cohort planning, induction, job-relevant training, and challenging assignments. In contrast, IBM was more concerned with focusing their training for business requirements and channelling them into areas where their skills could be best used.

IBM used Skillbase Inc. to retain access to mature specialised skills. Only BT introduced teleworking, and did so in a limited fashion to retain female software professionals. On another front, informal listening by BT middle managers was expanded in order to understand the skillbase on which business performance depended, and to identify needed retention efforts.

Among the soft benefits noted for giving a retention advantage, changes to career development proved to be particularly incongruent. While the literature gives considerable importance to this HRM lever in organisations with a policy of



lifetime employment (Beer et al., 1984; Osterman, 1987; Sonnenfeld, 1991), it emerged as a peripheral and reactive activity in our three organisations. The strong focus on performance and performance-related pay appears to have diminished the importance of career development. Within flatter organisations where horizontal career paths become more prevalent, career and its development takes on a new meaning. With the urgency to improve business performance, the concern with productive use of employees displaces in great measure the traditional caring attention to career development. The latter comes into play to absorb the pain caused by the business-oriented changes. These results support Miller's (1986) argument that there exists an inevitable conflict between the development requirements of professionals and the organisation's use of technology (and related skills) for changing business requirements.

## **PERSONNEL MANAGEMENT FUNCTION**

During the 1980s, all three organisations had a traditional personnel administration style with centrally determined policies and practices. Personnel followed prescriptions for best practice and was less driven by labour relations (Sisson, 1989a). Line managers were expected to implement the policies without modification, and corporate personnel was viewed as the enforcer. This situation supported the existence of the corporate-wide culture of lifetime employment. The personnel managers saw themselves as defenders of the policy and practices of lifetime employment, and kept line managers in check. Change was taking place at a slow pace with some noticeable acceleration in the latter half of the decade. Some decentralisation of HRM responsibilities took place, and line managers played a larger role. Generally, personnel continued to hold firmly to lifetime employment, but had less power to resist changes which line managers

sought to improve performance of their area. Unions have played a minimal role because changes in the top managerial ranks and in R&D were supported by the absence of a union or the presence of a collaborative professional union.

With restructuring, changes in centralisation-decentralisation of the personnel function proved to be complex, but generally made personnel less of an obstacle to SKISS. The value added by personnel was questioned, and line managers with IT and expert support were considered an economic alternative. Centralisation of routine personnel matters and loading first-line managers with more administration pursued economy goals (BT and IBM). These managers also obtained the ability to use a wider range of performance-related rewards (monetary rewards and recognition) in a timely manner. In contrast, decentralisation of non-routine matters sought to give middle and senior line managers within the division more autonomy (RSRE and BT) in order to improve business performance. HRM planning and control roles for middle line managers have strengthened the consistency between HRM activities and business performance concerns. This consistency has increased the likelihood of achieving synergistic economies (Hill and Hoskisson, 1987).

The development of explicit HRM responsibilities at middle levels of line management was not innovative, but the expansion, explicit recognition, and integration in the general management systems likely will facilitate the achievement of operating synergies across teams and research areas. Both Tyson (1987) and Sisson (1989b) have discussed the shift from personnel to line managers of personnel matters. Our findings add specificity in that routine and non-routine matters were found to gravitate to different levels of line management. Furthermore, it was found that, within the same organisation (BT), shifts towards efficient personnel administration (Clerk of the Works) and

strategy-oriented personnel (Architect) could take place simultaneously, thanks to a matrix structure, instead of a shift to one or the other (Tyson, 1987).

In summary, the personnel function has lost power to line managers with the greater emphasis on performance and economy. Personnel continues to play an important supporting role which is subordinate to line managers, especially in non-routine and strategic matters.

### **WORKFORCE PLANNING**

Within the personnel function, workforce planning has the potential to generate a skills supply strategy (Timberley and Sisson, 1989). Achieving a SKISS depends on moving beyond jobs and grades and on translating the business needs of the organisation into skill needs. The case evidence demonstrates that workforce (or manpower) planning has been unable to go beyond traditional practice.

Consistent with its history (Timberley and Sisson, 1989), workforce planning did not offer a favourable context for the creation of a SKISS because it was a servant of the financial planning and control systems. The focus remained on macro conceptions of skill (jobs and grades) that were anchored in the organisational structure, and right-sizing, whether downsizing or upsizing, the organisation was the main objective. Personnel would ensure that the transitions took place in an orderly fashion respectful of the policy of lifetime employment. IBM was no exception, but there, workforce planning was closer to the business plan. The firm also had a rich history of skills planning for specific line concerns of variable horizon. Though these systems and solutions were offered by



personnel within an area, corporate personnel did not value them enough to integrate them into the corporate-wide systems.

On a more favourable note, local and lab-wide skills planning was increasingly exercised by middle line managers as they pursued more demanding business goals. These managers received some training in planning techniques (as recommended by Kinnie, 1991), but learning-as-you-go was the dominant process.

The existence of the lifetime employment policy did not exclude downsizing the organisation because of an actual or expected downturn in sales or as a preparation for more intense competition. A general pattern was recognizable across the three cases. Initially changes in benefits (enriched exit packages) took place to increase the outflow of employees so as to downsize the organisation. While this took place over a number of years in BT and IBM and intensified in the 1990s, the threat of such action became prominent in RSRE in that decade. This top-down intervention was accompanied by top-down communications meant to increase employee involvement in the organisation-wide business change, and help redefine the employment contract and the underlying belief in employment security. Despite consistent attempts by management to improve the company image, employees responded by devaluing the organisation's reputation either in terms of its success or its caring responsibilities. In time, the work environment deep within the organisation began to suffer as employees fed on each other's uncertainties. In order to deal with deteriorating morale, management augmented formal and informal listening. Greater listening identified dissatisfaction with career development; management introduced measures to persuade employees of a future with the organisation. What emerges is a sequence of changes that begins with a top-down decision to modify the hard

benefits, and evolves into a deterioration of soft benefits. The ensuing morale problem puts pressure on management to monitor and understand the problem (bottom-up). Better informed, management responds by improving a soft benefit (career development) which had deteriorated through neglect.

The decline in morale can be explained by reference to the informal and social organisation. The exiting of employees in ever increasing numbers impacted on the daily lives of the remaining employees who were expected to change their ways of working, of doing more with fewer hands. Disruptions in social networks became evident, and the increasing amplitude of departures may not have given enough time for the networks to be reorganised and return to functionality. Social groups felt threatened, and negativity set in (Homan, 1950, 1974). Offering better career development signals that management foresees a period of stability which would give personal and group networks time to consolidate.

With the deterioration in the work environment also came a weakening of organisational commitment. Employees questioned the value of the organisation as successful and responsible employer, and consequently the value of their work. These multiple sources of commitment (Reichers, 1985; Coopey and Hartley, 1991) appeared to interact.

## **CONCLUSION: HRM INHIBITORS & FACILITATORS OF SKISS**

As the main determinant of the entrenched skills supply pattern, the policy of lifetime employment benefited from a consistent set of positive HRM features. However, both top management and the professional and managerial cultures were becoming less supportive over the 1980s and the 1990s. Personnel and

workforce planning remained strongly positive. That is, personnel function and systems were lagging behind leadership and cultural changes. As context, lifetime employment generally was unfavourable to developing other skill supply patterns and other uses of hard and soft benefits, but became slightly less negative over time as its meaning was gradually modified.

Top management was a strong positive feature for change which was reinforced by the evolving professional and managerial culture. Top management succeeded in driving change quickly when there were no negative HRM features in opposition. When negative features existed, the pace of change slowed down and management expended effort to broadly improve the context while simultaneously implementing changes in skill supply patterns. Top management also acted as a block to change when its industry and world framework was out of touch with the changing environment.

Most HRM features operated as conditioning features to SKISS and became more positive to supply patterns other than lifetime employment. Several broad changes were noted. Two conditioning features included:

Breaking with history through a new organisational status and mission;

Achieving broad consensus on the urgency of new policies and practices.

These conditioning features were operationalised through the following secondary features:



Breaking with the practice of in-bred top management thanks to a perceived crisis;

Empowering line managers to pursue higher business performance by diminishing the power of personnel;

Focusing HR assets to specific business requirements, supported by new hard and soft benefits which are performance-related;

Giving champions opportunities to argue for change and trying out skill experiments.

The above findings are consistent with those of Pettigrew and Whipp (1991) who identified five factors for successful change, among them leading change, linking strategic and operational change, and treating human resources as assets and liabilities. The findings also indicated that the personnel function and its systems operated as a strong stabilizing factor, and generally impacted negatively on any supply pattern that threatened lifetime employment. It required massive structural change, new management systems, and a shift of HRM responsibility in favour of line managers to diminish this block to change.

Sustained competitive pressures and the view that organisational survival was at stake led to changes in top management values and perceptions, and in the managerial and professional cultures. The pace of change was generally slow and awaited a major organisational restructuring and work reorganisation to have a broad effect. The example of IBM suggests that restructuring only acts as a catalyst if the management cadres are convinced that organisational survival is at stake. The BT SKISS on management style was successful because it set up a

repeated sequence of mobilising HRM followed by structural change, followed by HRM change, and so on, over an eight year period.

The maturing of computing science and the growing number of business-minded software researchers, due to slow but sustained recruitment, also helped to make the HRM context more supportive of the new business and work practices that were needed.

We conclude that improving the HRM context through skill supply patterns and the enhancement of certain HRM features leads to subsequent improvements in other HRM features. This improved context can support more ambitious skill supply patterns. At the same time, coherence of HRM components was shown to be achievable for a targetted group (top management group and graduate recruits), but difficult to achieve for the entire workforce. Changes in hard and soft benefits were introduced at different times and for different reasons, sometimes as a deliberate package, at other times as a reaction to restructuring and local skill shortages. These findings add specificity to the broader HRM work of Pettigrew and Whipp (1991) and Beer et al. (1990).

## **CHAPTER 9. CONCLUSION & DISCUSSION**

This concluding chapter summarizes the purpose of the thesis, the empirical findings based on the three case studies, and the development of the concepts of SKISS and retention mechanisms. A model of the top-down and bottom-up processes influencing skill supply patterns is elaborated, and the influence of the HRM context is evaluated. The findings are informed by the strategic literature, and the new HRM management roles are situated in the literature. The chapter ends with policy recommendations for managers, limitations of this study, and avenues for future research.

### **CONCEPTS OF SKISS & RETENTION MECHANISMS**

Skills supply strategy or SKISS is defined as the intentional shaping and sizing of the organisation's skillbase (composed of technical, interpersonal, and managerial skills) for the purpose of supporting the business strategy. The literature indicated that within large high technology organisations, the internal labour market is considered an important resource; through the recruitment, development and retention of knowledge workers, we ensure innovation. Through appropriate structure and work organisation, the skillbase becomes productive and purposeful. This broad model summarised in Figure 2.1, guided this research endeavour, subject to modifications in the light of the findings.

This dissertation argued, at the outset, that SKISS offers the conceptual advantage of disentangling the management of skills from the broader concept of HRM which impacts on all aspects of the organisation and its people. SKISS is complemented by the more narrow concept of recruitment and retention



mechanisms. The rewards offered to attract and influence employees can be thought of as hard and soft benefits, where hard refers to compensation and benefits, and soft refers to job characteristics and more general factors to do with work, organisation and social environments. This concept helps to focus on the motivational aspects of the workforce and managerial attempts to influence organisational entry and exit.

From this starting position, we must now ascertain whether SKISS remains a promising concept in light of our findings. Specifically, what did the findings reveal about the strategic and non-strategic dimensions of skill supply management within R&D?

### **SKISS AS A TOP-DOWN & BOTTOM-UP PROCESS**

This researcher established four criteria to satisfy in order that a skills supply pattern be considered strategic:

- (1) an identifiable link with the changing business strategy;
- (2) managerial intentions to create and maintain HRM support for the business strategy;
- (3) a coherence among the HRM elements which are mutually reinforcing in terms of supporting the business strategy;
- (4) a consistent managerial effort to achieve and exploit the desired linkage to business strategy.

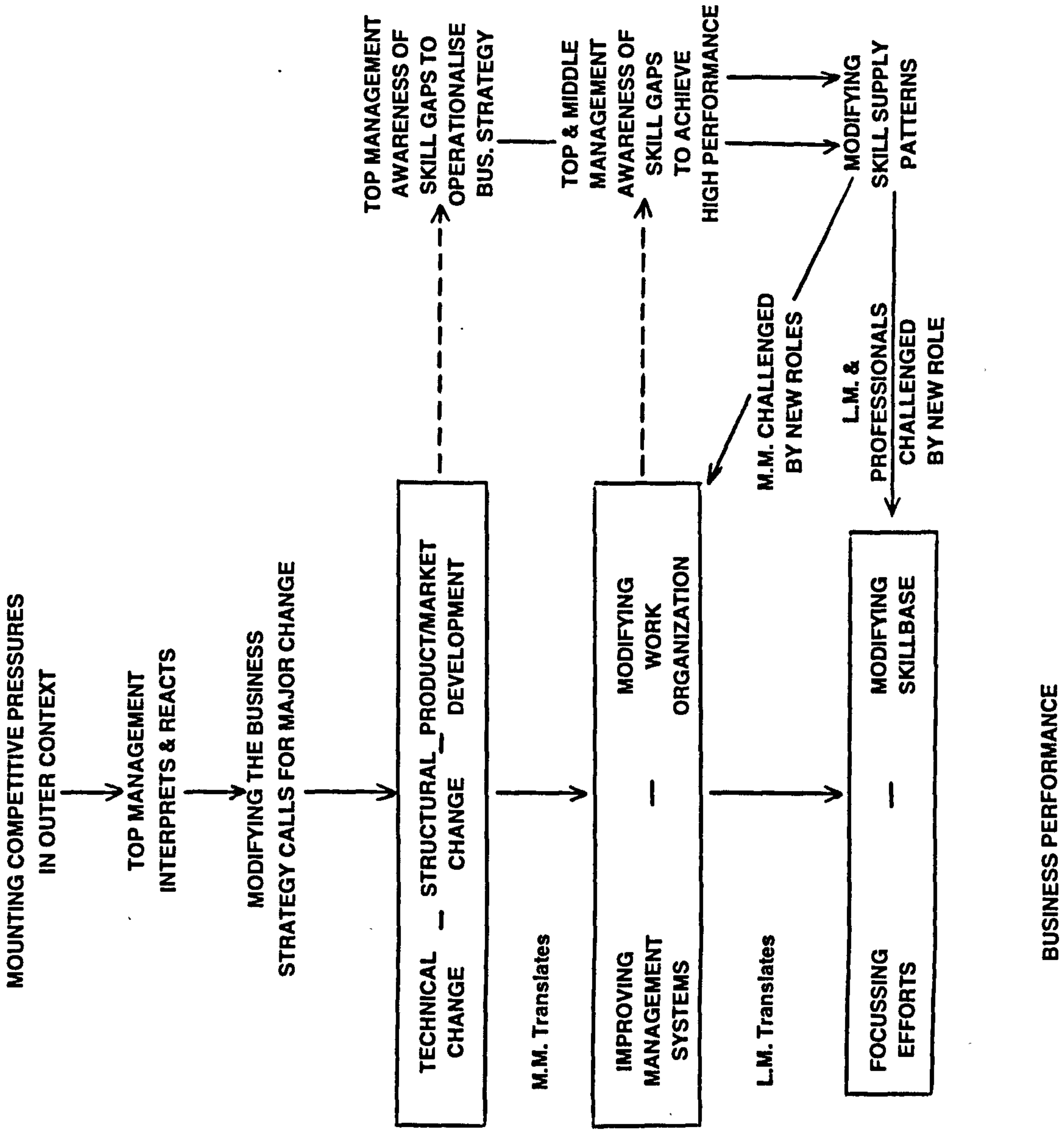
The discussion below ignores the single-lever SKISS because, as our findings demonstrate, it is a specific response (accessing external labour markets) to a specific problem (competitive recruitment for scarce professional skills) which leaves untouched the remainder of the organisation. Such a SKISS raises few issues of interest. On the other hand, the multi-lever SKISS is a good test for strategic activity as defined by the four criteria above.

### **SKISS AS A TOP-DOWN PROCESS**

Summarized in Figure 9.1, our findings support the existence of SKISS as a top-down process, but as a rare occurrence which depends on intense and prolonged competitive and customer pressures in the outer context. Inevitably, top management undergoes a profound perceptual/cognitive shift concerning the environment and the organisation's position within it. The leadership adopts a new mission and a radical change in business strategy which calls for significant technical, structural and product-market changes. These latter changes reveal skill gaps in top and middle management which inhibit the strategy's operationalisation.

Top middle management also become aware of skill gaps in response to changes in management systems and changes in the work organisation which they implement as part of operationalising the business strategy. These gaps have more to do with performance levels which first-line managers and researchers can achieve in the modified work context. Several authors have noted the relationship between work organisation and the corresponding horizontal and vertical balance of professional and managerial skills (Shenar and Thamhain, 1994; Griffin, 1987; Boyatzis, 1982; Katz, 1974). However, from a change

Figure 9.1 SKISS AS A TOP-DOWN & BOTTOM-UP PROCESS



NB M.M. = Middle Line Management  
L.M. = First Line Management



perspective, management awareness of skill imbalances and gaps comes through their concern for improving business performance.

Both sources of awareness of skill gaps (initial strategy formulation vs subsequent elaboration) lead to changes in skill supply patterns and form a coherent package of changes in hard and soft benefits. However, in the process some of the existing soft benefits deteriorate and cause low employee morale. Management responds by improving some of the soft benefits such as career paths and formal listening systems. Both initial and subsequent adjustments of benefits take place within the larger HRM context where other benefits are determined by the lifetime employment policy and adhoc skill interventions. Complete coherence in benefits is not achievable during a period of sustained change.

Compared with the original model (see Figure 2.1), this empirically-based model indicates that skill concerns emerge later in the operationalisation of the business strategy when business performance gaps point out skill gaps. The strong and sustained top-down process helps to translate these skill gaps into new management roles.

### **SKISS AS A SECONDARY BOTTOM-UP PROCESS**

Despite the strong top-down process, managerial awareness of skill gaps remains a reactive and emergent process, a secondary stage in the strategy process. The well-established business strategy elements of products and markets, technology, and organisational structure set the stage for skill considerations. There is no evidence of using skill audits to create a forward looking set of core skills as recommended by Klein et al. (1991). Though the management group realize that

certain professional and managerial skills are critical for business success, the idea of obtaining a competitive advantage through skills remains outside the realm of practice. The secondary importance of skills leaves the task of creating an overall coherence in HRM components to personnel which tends to perpetuate the package determined by the policy of lifetime employment.

New Roles for Managers. A second emergent process involves the emergence of new management roles. Again, this situation is closely intertwined with the operationalisation of the business strategy, but the intentions of top management are too broad to determine the actual roles which emerge. Downsizing of non-core activities (e.g., middle management, personnel, marketing) accompanies the structural change, and with the industry trend of aligning R&D to the business strategy (Whittington, 1991), new roles for management are gradually defined. While the strategy intentionally introduces the guideline of devolving responsibility to lower management, it is the surviving middle managers who bring the idea to reality. These middle managers also see themselves pushed away from the technical work and encouraged to tackle the productivity issue for the smaller workforce. Gradually, a skills planning and management role emerges. Meanwhile, the greater emphasis on more direct contributions to business performance prompts lower levels of management to take a broader view of the skills of their local workforce, beyond individual preferences and research interests.

Team leaders, first, second and third line managers have always played an active role in managing people. Now, new and more specialised roles emerge with the creation of business units (or their equivalent) and formal mid-level strategic mechanisms. Team leaders become technical managers, and first line managers take on broad but routine HRM responsibilities. In contrast, second and third

level managers are distanced from the technical work and to some extent from the detailed aspects of technical planning, and adopt a broad HRM strategic roles. Managing and influencing the skillbase become explicit responsibilities, and are reinforced by their participation in formal mid-level committees with a broad HRM mandate.

Zuboff (1988) has recommended similar role changes in order that an organisation obtain the full benefits of computerization. Our findings do not support the hypothesis that computerization acts as the trigger to new HRM roles. These organisations have used computers for research for over a decade. However, improved computerized management systems did encourage the devolution of routine HRM duties to first-line managers.

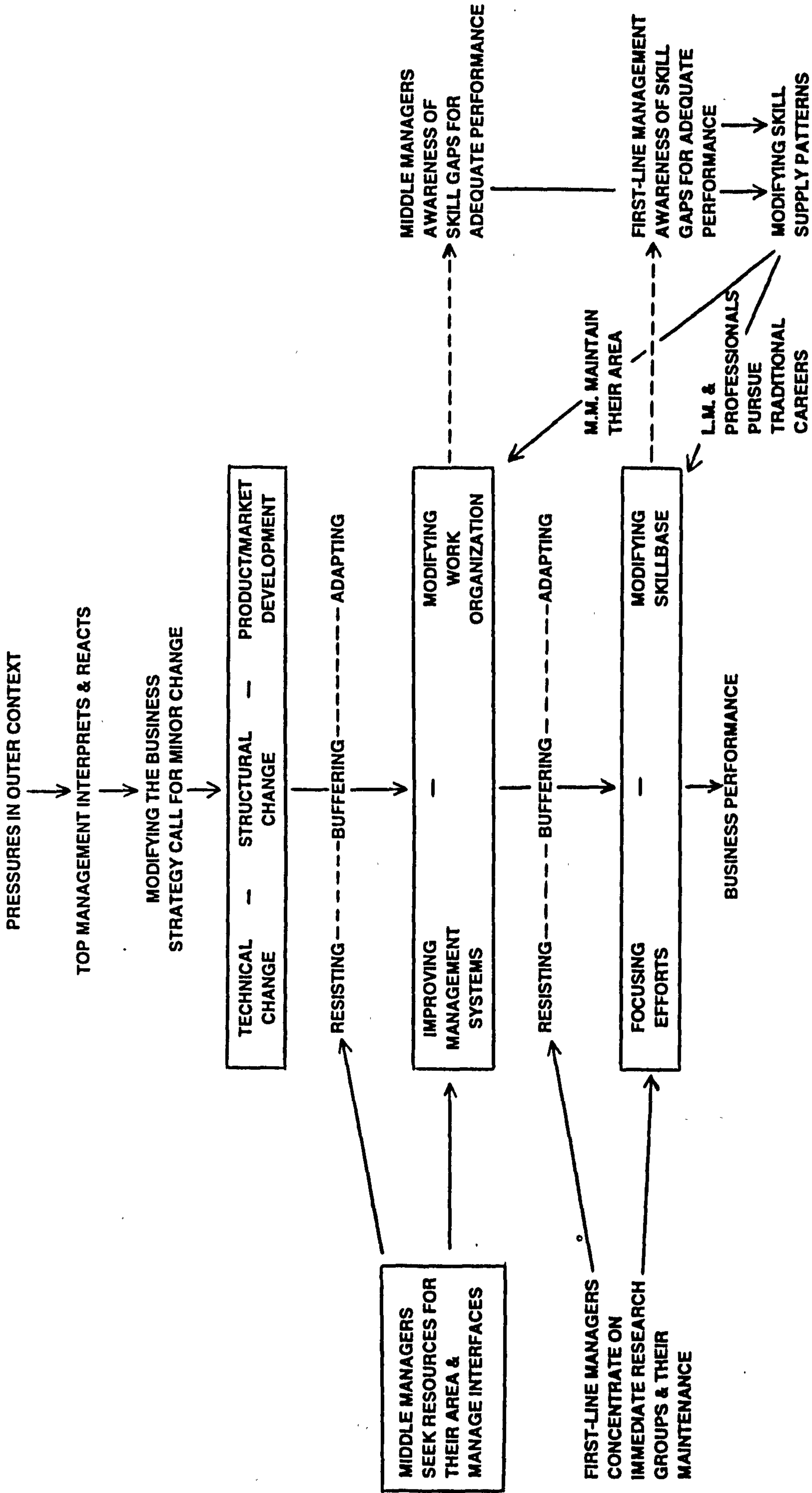
Storey (1992) also found that large U.K. manufacturing firms had created new middle line management roles which fused HRM responsibilities with business management, but that difficulties existed in achieving a coherent package of interventions. He also reported that first-line managers were given HRM responsibilities in communications, employee involvement and development. Thus, outside the IT sector, management is also being transformed.

### **SKILLS SUPPLY AS PRIMARILY A BOTTOM-UP PROCESS**

If SKISS is a rare occurrence, what happens the remainder of the time? Adjustments to the business strategy occur periodically in response to usual pressures in the environment as perceived by top management (see Figure 9.2). Most of the time, only minor changes are called for in the technical, structural and product-market aspects of the organisation's operations. Within this non-



Figure 9.2 SKILLS SUPPLY AS PRIMARILY A BOTTOM-UP PROCESS



turbulent inner and outer context, R&D managers are driven by non-strategic preoccupations and interests. The social and operational context (e.g., budgeting and project allocations) favors continuity in the relative importance of research areas and the pursuit of traditional research and management careers. Both middle and lower managers monitor skill gaps which may affect "adequate performance" and which have only a loose link with the business strategy. Recruitment of managers and professional with skills considered critical for the success of the strategy does take place, but at low levels and often with new resources.

Managers actively buffer their areas from any top-down change which could upset their on-going interests defined in terms of access to resources and maintenance of preferred research projects. Buffering gives them time to adjust their on-going operations in a manner consistent with corporate intentions and without disrupting their skillbase. They translate the strategic intentions into something familiar and non-threatening. If translation seems impossible, middle management actively blocks change.

The literature supports the importance of maintaining safe and stable environments for researchers in order to foster expertise and high performance (Badaracco, 1991; Zuboff, 1988; Schon, 1987, 1983). Even in a manufacturing context, continuous application of skills is required for high performance (Nelson and Winters, 1982). So long as middle line managers are focused on their immediate areas of responsibility, they are likely to slow down the pace of change.

Under conditions of usual pressures in the outer context, this bottom-up domination of the labs leads to adequate performance of the R&D division. It

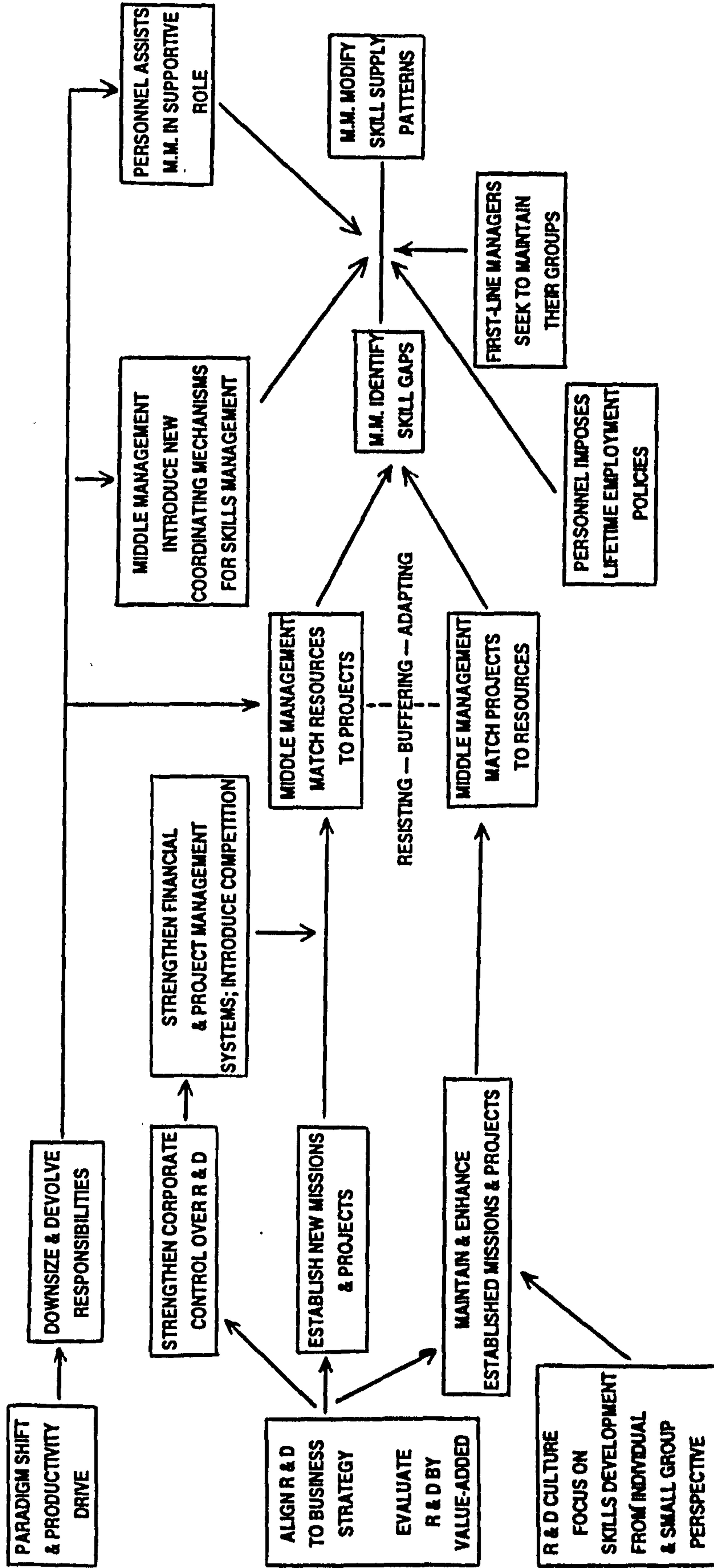
gives some support to the business strategy, but also pursues its own technological vision composed of a multitude of diverse views and innovative impulses. The introduction of improved financial and project management systems also reassures top management that improvements in research performance are taking place. When the outer context becomes progressively more hostile and the business horizons become shorter, this bottom-up process hampers the attainment of high business performance.

### **SKISS WITHIN R & D**

The transition from a skill supply pattern which has a strong bottom-up process to one which is dominated by a top-down process takes place only when key top managers have come to terms with the new environment through a paradigm (Kuhn, 1962) or interpretive (Daft and Weick, 1984) shift. They respond through downsizing and emphasising the need to achieve rapid productivity and performance improvements. Gilmore and Hirshhorn (1984) have commented on the relationship between retrenchment and a productivity drive among white collar workers, but confined their discussion to managing interpersonal relations. Schneier et al. (1992) went further and proposed a variety of strategies to achieve white collar productivity after downsizing, including work reorganisation. Our findings confirm those of Sullivan and Hogge (1987) that the R&D workforce undergoes less contraction than the remaining organisation. However, it was found that downsizing acts as the trigger to broad changes in structure, management practices, and work organisation within R&D. Figure 9.3 situates SKISS within these broad changes, and incorporates elements from the more generic Figures 9.1 and 9.2.



Figure 9.3 TOP-DOWN & BOTTOM-UP PROCESSES AFFECTING SKILL SUPPLY PATTERNS IN R & D



The surviving middle managers come to share top management's sense of urgency, and support the devolution of broad responsibilities to first-line managers as a way of coping with the large spans of control they have been given in the new structure. They also take up the challenge of enhancing the performance of their area by careful planning and management of their area skillbase as part of matching limited resources to projects. With the introduction of tighter financial and project planning systems, and the threat of competitive sourcing for R & D services, middle managers adopt a more disciplined approach to people management. An important shift in emphasis takes place away from servicing existing employees to actively planning projects. Flexible teams and transferable skills become more important. This shift in emphasis conflicts with middle management's traditional loyalties and ways of reconciling corporate and local interests. Yet, these managers show considerable enthusiasm as they grow into broader business managers and redefine their role of 'survivor' in a downsizing context.

With growing short-termism in projects, managers strive for a flexible and evolving skillbase (Kosnik, 1990). However, creating such a skillbase proves to be a slow process in large R&D divisions. Top management assists the above changes in roles by clearly designating a few key principals of restructuring and encouraging middle line managers to create formal mechanisms with real powers over HRM policies. As these managers grow comfortable with the exercise of their new responsibilities, they pay more attention to the emerging performance gaps which indicate skill gaps. The top-down process does not eradicate the bottom-up process which continues to have a strong influence through personnel and first-line managers. It does channel and align the bottom-up process with requirements of the new business strategy. Note that this alignment is



maintained by sustained top management involvement, and favorable changes in the HRM context which are gradually created.

Storey (1992) reported on a similar transformation within the mainstream manufacturing sector in the 1980s, starting with competitive pressures (e.g., globalization of markets), followed by downsizing and the emergence of a "crucial fusion" of business and HRM concerns in the form of broad roles in middle and first-line management. This parallel industry development may be accounted for by vicarious learning (IT leadership observing the manufacturing leadership) or by the impact of organisational size as the critical contingency factor (Child, 1975).

The model outlined in Figure 9.3 indicates that with a downsizing context, the surviving middle managers are seeking a new role. Fulop (1991) complained that the literature on downsizing has failed to describe what happens to surviving middle managers. Dopson and Stewart (1990) also were critical of the literature on middle management, and concluded that empirical studies demonstrated job enrichment for many middle management jobs after IT restructuring. Too much has been attributed to the effect of IT as cause of downsizing and as decimator of middle management ranks (Applegate et al., 1988; Leavitt and Whisler, 1958) and not enough on other causes of restructuring and the emerging roles for the numerous survivors. Our findings help to fill this gap by identifying a HRM role for middle management in a downsized (or potentially downsizing) R&D division.

A broad mandate of skills management (sizing and shaping) for middle line managers is an expansion of their previous HRM duties and can become more division-wide. This development takes advantage of the embeddedness of the skillbase in the work organisation and the social networks. Middle managers in



R&D have typically risen from the ranks and, until recently, many have kept some involvement in the technical side of projects. They are likely to have a detailed understanding of the work organisation, and have extensive horizontal and vertical networks made easy by the collegiality of researchers.

We can expect that the greater involvement of middle managers in skills management will lead to more upward influence and strategic conversations with senior managers (Westley, 1990) focused on this area. Upward influence would become more pronounced if senior management concentrated on creating the strategic context and empowering middle managers (Fulop, 1991; Westley, 1990; Wooldridge and Floyd, 1990). Other facilitating factors would be the creation of business units and a personnel function which helps line managers to solve business problems. With these additive positive factors, the management of skills may become more tightly woven with business strategy.

### **THE HRM CONTEXT**

Lifetime employment remains the dominant skills supply pattern of these large organisations, and can best be described as a traditional cluster of HRM policies and practices, namely, controlled entrance and exiting of small numbers of university graduates, broad training and development, redeployment and retraining, and a significant peripheral workforce. The linkage with business strategy is diffuse. Lifetime employment inhibits the development of SKISS because this policy framework is used to evaluate any deviations from standard HRM activity.

Because of its dominance, lifetime employment acts as part of the HRM context for other skill supply efforts, and is strongly supported by other features, namely,

top management values and beliefs, professional and managerial cultures, the personnel management function, and workforce planning. Recently, some of these features have become less supportive, under the influence of changes in skill supply patterns that responded to top management intent and the growing importance of software in the merging IT industry. The sizing and shaping of senior and middle management (top-down process) helped to emphasise a new paradigm which placed more emphasis on competitive and customer forces and a responsive and performing workforce. Downsizing also affected personnel, the guardian of traditional HRM policies, which found itself smaller and with a clear role of supporting line managers in a flexible and business-first manner. Storey (1992) also reported that personnel had lost the initiative to line management. Sustained recruitment of IT people (bottom-up process) reflecting the scientific and industry shift in favour of IT created an alternative culture more sympathetic and responsive to business requirements than the traditional engineering and and physics culture.

The above changes in the HRM context responded to both top-down and bottom-up efforts to meet performance requirements, and over time, came to be mutually supportive to the new business orientation, and at the same time, less supportive of the policy of lifetime employment.

## **REVISITING STRATEGIC HRM**

This investigation of SKISS has brought to light broader managerial roles integrating HRM concerns with business considerations. These line managers are aware of the importance of skills to the performance of the R&D division and their specific area. While these findings are supportive of the resource-based theories of strategic HRM (Wernerfelt, 1984; Schuller and MacMillan, 1984;



Ulrich, 1991), they demonstrate that skill interventions pass through the performance "lens". This focus closely resembles the emphasis of strategic behaviours (e.g., innovation for a growth-oriented firm) of the behavioural theories of strategic HRM (Miles and Snow, 1984; Schuler, 1991; Schuler and Jackson). Unfortunately, these theories fail to explain how these strategic behaviours come about, and remain distant from actual work roles. Our findings call for elements of both groups of theories, with attention to human resources as a consequence of performance goals, and not as its antecedent.

Butler (1988) was more specific in describing how middle management could contribute to both the intended and emergent strategy through corporate selection and rewarding of behaviours which were consistent with opportunity recognition as an on-going management activity. Our findings do not support this view for the R&D division which has high continuity in its mission and projects. Furthermore, our findings contradict Mintzberg and Water's (1985) linkage between strategy and environment. They argued that in a turbulent environment, an emergent strategy was appropriate; in a stable environment, an intended strategy was the best. Our findings for R&D were the opposite, with a turbulent environment leading to a shift towards a more intentional strategy in these large firms.

## **POLICY RECOMMENDATIONS**

Heightening Awareness of Skill Issues. Future organisations are expected to be heavy users of knowledge workers, and this certainly will be the case within R&D. In sympathy with the quick-fix technology bias that exists in western culture, Applegate et al. (1988) propose that in the next century IT will shape the organisation peopled by large numbers of mobile knowledge workers. Short-term



projects and high employee turnover will be the norm, with corporate history, experience and expertise maintained by the IT systems. Project teams are managed by highly valued project managers busy assembling and disassembling skills. These authors suffer from naive assumptions about the ease of creating and maintaining group cultures. Their model of skills as standardised and fully encapsulated by artificial intelligence has appeal but lacks a concrete organisational and work context. It ignores the embeddedness of people working with and around computer screens. Their vision may be appropriate for areas where standard and explicit solutions and contexts exist, but would not suit R&D despite the shift towards short-term and market-driven work. Strategic decision-makers would benefit from a better understanding of the complex nature of human skills and their embeddedness in the work and social organisation (Mahoney and Pandian, 1992).

Enhancing Middle Managers as Skill Strategists. Accepting that middle managers can share in strategy-making is not easy for many senior managers to accept as legitimate (Guth and MacMillan, 1986; Kay, 1974), and may be particularly difficult in organisations emerging from the public sector. Schilit (1987) found that middle managers in the private sector exercised upward influence more frequently than their counterparts in the public sector for both low risk and high risk situations. Interestingly, low risk issues were typically related to organisation, labour and staffing.

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Wooldridge and Floyd (1990) suggested that limiting their involvement may arise for several reasons: politics (limiting potential conflicts), competition (quick response and controlling information leakage), and costs in managerial time and energy. On the other hand, their greater involvement is consistent with the high social and operational embeddedness of R&D activity. Macdonald (1992) has

argued that firms need not worry about knowledge leakage because the flow of information across firms through informal networks in the community of researchers enhances the individual firm's R&D.

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Developing Middle Managers into Skill Strategists. The embedded nature of the managerial skillbase and their involvement in the strategic process argues for careful development of middle managers (Pelikan, 1989; Eliasson, 1990). Keer and Kackofsky (1989) proposed that for a clan-type culture as one finds in R&D, management development (as opposed to management selection) is more effective for aligning managers with strategy and its implementation. They viewed such an organisation organically with both managerial abilities and strategic demands evolving over time. Extended socialisation and learn-as-you-go should be complemented by succession planning, mentoring and training. Exposure to the difficult topic of embedded skills would prepare them for careful shaping of the skillbase. The above suggestions nevertheless must reflect the reality of a flatter organisation which may experience additional reorganisations in a turbulent future. Horizontal development within R&D and with other internal and external partners becomes the guideline, not vertical development. Our recommendations concur with those of Weick and Berlinger (1989) and their concept of career improvisation, but conflict with Kanter's (1984) emphasis of inter-firm career mobility which was attributed to managers in high tech organisations in general rather than in the R&D division. Kanter ignored the issue of embedded skills and how they are fostered.

Vollman and McAuliffe (1968) and Cone (1969) pointed towards embeddedness by identifying several causes of obsolescence including new forms of organisation and social developments. Unfortunately, the current trend of isolating middle managers from technical work will accelerate the misfit. There comes a point



where the work context has evolved and the middle manager plans and acts with poor grounding. This degradation can be compensated to some extent by the regular involvement of technical managers, and some kind of job rotation. The challenge resides in creating strategic HRM roles for middle managers while retarding the inevitable effects of obsolescence.

While embedded issues require the subtle skills of line managers through networking, the greater use of rigorous financial and project planning systems calls for more generic skills (Hosking and Fineman, 1990). The absence of key generic skills are corrected easily with some external recruitment of experienced managers and the systematic training of the management cadre. These generic skills are more easily articulated and make the task of monitoring and fostering them an easier task (Winter, 1987).

### **LIMITATIONS OF THIS STUDY & FUTURE RESEARCH AGENDA**

This investigation defined and supported the concept of SKISS, and demonstrated its usefulness and limitations for the study of strategic management. The empirical data collected and the relevant academic literature accessed has given a solid basis for future research on this area. However, the thesis does suffer from some obvious limitations. The in-depth study of three organisations has revealed certain findings which may or may not be relevant for other organisations. The choice of organisations was both fortuitous and constraining. IBM was the sophisticated private enterprise "par excellence", yet BT proved to be the most profitable choice for revealing the top-down process of SKISS. In contrast, RSRE helped to confirm the pervasiveness of embedded skills and the bottom-up influence of managers, but had little experience pursuing a business strategy in a competitive environment. The single perspective of the



researcher has led to an intensive intellectual effort helpful to his development, and counterbalancing measures were taken to minimise personal bias through feedback from participants and academic supervisors. Only through additional case studies and other types of data (e.g., surveys) can one hope to generalise the findings with confidence. The absence of top management participants is some cause for concern, but the presence of professionals, lower and middle level managers strengthen our conclusions concerning middle managers.

Several areas would benefit from additional research. First, efforts are warranted in clarifying the nature of embedded skills (both professional and managerial) in particular organisational contexts and how they change over time. Second, such investigations would also elucidate the transfer of skills and the conditions which make this possible. Presumably, core capabilities across organisational units and across organisations may have commonalities which facilitate skill transfer (Nelson, 1991).

Third, more empirical work is needed on SKISS and the HRM context, in particular in other industries with growing use of knowledge workers. Our findings suggest that line managers can rise above the social and technical embeddedness of work to address skill issues by gradually changing the HRM context that locks-in the lifetime employment policy.

Fourth, it would be worthwhile to continue to document the changes to lifetime employment as the dominant skill supply pattern in large organisations in the private and public sectors. What factors are facilitating or inhibiting the changes, and what other skill supply patterns emerge?

Fifth, researchers could add to the small empirical base which exists on the new roles of middle managers and how these managers alter their actions when dealing with each other. In the past, they focused on a clearly defined departmental boundaries and treated each other as both territorial allies and foes. Strauss (1962) enumerated ways of managing fellow middle managers: creation and evasion of rules, the "old boy" network, educating others about their function, and interaction tactics. Do their methods change when they are given broader HRM responsibilities? How do they reconcile the competing claims of their "territory" and those of the entire Division?

Managing knowledge workers for competitive advantage will continue to be a worthwhile topic for the foreseeable future. Whether researchers accept the challenge will depend, in part, on whether the tools of an appropriate conceptual language and framework exist. This researcher believes that skills supply strategy or SKISS has made some contribution.



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## **APPENDIX 3-1: PROTOCOL FOR INTERVIEWS**

**1.0 COMPANY & STRATEGIC OVERVIEW**

**2.0 SKILL REQUIREMENTS**

**3.0 SKILLS AVAILABILITY**

**4.0 SKILLS SUPPLY STRATEGY**

**5.0 MANAGEMENT OF INTERNAL LABOUR MARKET**

**6.0 TURNOVER**

**7.0 HUMAN RESOURCE MANAGEMENT**

**8.0 HUMAN RESOURCE DEVELOPMENT**

**9.0 MANAGEMENT STYLE**

**10.0 PROJECT MANAGEMENT**

**11.0 NETWORK MANAGEMENT**

**12.0 QUESTIONS FOR KEY/PROBLEM EMPLOYEES**

**13.0 GENERAL QUESTIONS**

**NOTE BENE**



## **1.0 COMPANY & STRATEGIC OVERVIEW**

### **1.1 Locations**

### **1.2 Company origins and age**

### **1.3 Ownership (and independence)**

### **1.4 Business and Markets**

- products and services
- major customers, location, and quality of relationship
- relationship with suppliers
- with business and academic partners

### **1.5 What does business success depend on in this industry?**

### **1.6 Size of company (with trends)**

- Employees by job groups
- Investment in R & D

### **1.7 How has the competitive situation evolved in the 1980s?**

### **1.8 Major developments in recent years (10 year period) affecting:**

size, rate of expansion/contraction, product-market orientation, number of employees, revenues, profits

1.9 How is the company organised, eg major depts, work organisation, major tasks and skills, etc?

Have the above recent developments affected company organisation and structure in any way?

1.10 What are the current business challenges? The current business strategy?

1.11 What changes are taking place (or will) in the firm to meet current business challenges: structure, work organisation, major tasks and skills?

1.12 Which are the key groups of employees for meeting these strategic challenges? Explain and locate within the organisation.

1.13 What is the management structure, senior managers' ages background, time with company?

## **2.0 SKILL REQUIREMENTS**

2.1 What is the mix and variety of skills?

Number of employees by occupational groups, levels, or skill categories (as defined by the company)

2.2 Employment distribution by...

chronological age

length of service

sex

2.3 What skills are in short supply (including senior management skills)?

2.4 What have been the major 'triggers' to skill requirements in recent years?  
Has the skills level risen or fallen?

### **3.0 SKILLS AVAILABILITY**

3.1 For what levels of the organisation do you recruit externally? To what extent? What skills are readily available?

3.2 How does the nature of the following affect the supply of skills?

- the sector
- the size of the firm
- being part of a larger group (if applicable)
- the occupational groups concerned
- the local labour market
- unions or professional bodies

3.3 Have you noticed any changes in characteristics (skills, values and life goals) in new employees? In your regular employees?



#### **4.0 SKILLS SUPPLY STRATEGY**

- 4.1 What sources of supply are used for recruiting the key groups of employees (local/regional/national/ international)? Are they adequate? Have any changes in sourcing taken place?
- 4.2 For the key/problem employee groups, what employment practice is pursued (full-time permanent, full-time temporary, part-time permanent, part-time temporary)?
- 4.3 How does your firm assess skill needs?
- 4.4 Does the firm have a short or long-term perspective on skills development?
- 4.5 Have you changed your approach to skills supply at all over recent years (e.g. are you recruiting from different age groups, from different product sectors, or relying more on training?) Do you foresee further changes, and if so, why?
- 4.6 What is the lead time for developing or acquiring key skills and why?
- 4.7 How far do you rely on 'poaching' skills?
- 4.8 Which skills do you see as vulnerable to being poached away by other companies? What do you do about this?
- 4.9 How far are skills in this company firm-specific and therefore easier to hold?

## **5.0 MANAGEMENT OF AN INTERNAL LABOUR MARKET**

5.1 Do you treat all or some the firm's business units as one large pool for skills deployment?

5.2 What facilitates/hinders skill redeployment across business units (geography, specific skills, core skills, transferable skills, work settings, employee preferences, career paths)?

## **6.0 TURNOVER**

6.1 What is your current turnover rate? Are you concerned about certain employee groups? Explain.

What was the turnover rate during the 1980s and how did it change?

What prompted these changes?

6.2 How is turnover monitored (employee groups, business units, etc)?

What does turnover mean for the firm (avoidable vs unavoidable costs)?

Have any steps been taken to influence turnover? What was the purpose and the effect?

What steps were taken to control the severity of losing people (i.e., retaining most valued employees through measures such as development programs)?

6.3 How do you capture and use turnover data? How detailed is the breakdown in information?

Who makes use of the information and for what purpose?

Have there been any changes in this information system?

What prompted the changes and how did they come about?

## **7.0 HUMAN RESOURCE MANAGEMENT**

7.1 Who sets HR policy (division, UK head office, corporate head office)? How are HR policies harmonized?

7.2 Does the HR department play a strategic role (part of senior management, liaising with senior operators on business objectives and people development (success and issues)?

In terms of a HR planning system? Links to business planning?

When did this begin? What prompted it? How did it's role change in the 1980s?

7.3 What role do line managers play in HRM? How are they assisted (tools, training)? How are they evaluated/rewarded?

7.4 What unions cover managerial and professional/technical staff? How is this relationship managed? History of relationship (good/poor, collaborative/antagonistic)?



7.5 What methods of recruitment are used for key employee groups (campus recruiting, newspaper advertising, professional networks, employment agencies, executive search firms)?

7.6 Describe the different types of employment contracts that you offer? To whom are they offered?

How much flexibility is there in the terms and conditions offered? Are exceptions made for key employee groups?

7.7 What changes took place in employment contracts in the 1980s? What prompted the changes? How did the changes take place (as exceptions, for specific groups only, region specific)?

7.8 How does the pension plan work? And benefits? What changes took place in the 1980s? What prompted them and how did they come about?

7.9 Do you (or did you) offer early retirement? When was it introduced and for what reason? How did employees react?

7.10 Describe the compensation program. How are pay levels determined (local/regional/national/international comparisons; industry/cross-industry competitors)?

What changes have taken place during the 1980s? What prompted these changes and how were they introduced?

7.11 How are salary increases given (COL, merit increment)?

Is pay linked to performance? How are targets set and progress measured?

Are poor performers penalised? What opportunities are they given to improve? Encouraged to leave?

7.12 Describe the benefits program. How is it determined?

What changes have taken place in the 1980s? What prompted these changes and how were they introduced?

7.13 What flexibility exists in working hours and conditions? When were they introduced? what prompted them? Were other changes required to accommodate these changes?

7.14 How does communication take place within the firm (formal and informal mechanisms)? What changes have taken place in the 1980s and how did they come about?

7.15 What relations do you maintain with the outside system of training/education/development, and how do you use it to help retention?

7.16 What level of success do you have in retaining key employee groups? Problem groups? How do you explain it?

Has it changed in the 1980s? If so, what accounts for the change?

7.17 What are the current issues involving these key employees?

7.18 Does the firm have a long standing philosophy and commitment to its employees? Concerning retention?

To what extent is it implicit or explicit?

What influence did it have on defining critical skills for business success?

7.19 Is there an explicit retention objective which the firm pursues? If yes, how is it defined?

How is it linked to the business strategy (maintaining market share, productivity objectives, costs, flexibility)?

7.20 What changes in HRM activities have taken place to reach this retention objective? (If no, how do you think changes in HRM activities have influenced retention?) Where does flexibility exist?

7.21 How do you prepare/support managers to adjust and manage these flexible work arrangements?

7.22 How do you monitor the effectiveness of the HRM systems? Their contribution to reaching the retention objectives?



## **8.0 HUMAN RESOURCE DEVELOPMENT**

8.1 What is the company philosophy concerning the development of your employees beyond training for immediate and specific needs?

Has it changed in the 1980s? what prompted the changes and what was their impact on HR practices?

- 8.2 How does this contribute to the retention of employees? Critical groups? Problem groups? Other employees?

- 8.3 Describe the career planning that takes place.

How is career planning linked to ...

- training & development?
- appraisals?
- job assignments?
- task assignments?

8.4 What flexibility exists in career planning? How did this come about?

8.5 What changes have taken place in career planning in the 1980s? What prompted them and how did they take place?

8.6 What career paths are currently available (Technical/Professional and Managerial)?

8.7 What path changes took place in the 1980s? How did these changes come about (restructuring, retrenchment/growth, changes in products/services, new employee values)?

Impact on employees (critical groups, problem groups, other employees)?

8.8 How do employees define career success? Have any changes taken place in the 1980s? What HRM changes took place as a consequence?

8.9 Does succession planning take place? Describe. How did it come about?

## **9.0 MANAGEMENT STYLE**

9.1 How would you describe the style of senior management? Is there a particular philosophy or approach to HRM?

9.2 How does management view innovative professionals and their managers? Risk taking and errors/failure?

9.3 How does senior management communicate its approach to middle and lower levels of management?

9.4 How are innovative employees expected to behave? High achievers?

**10.0 PROJECT MANAGEMENT (Pertinent to R&D, contract bidding, and team approach)**

10.1 How are groups formed and managed? How are specific work assignments made? How long do they last?

10.2 How do you retain your talented people? Have you ever lost someone? What happened?

10.3 What is your involvement with the career planning program? How do they fit in with the department and project requirements?

**11.0 NETWORK MANAGEMENT (Keeping skills and strengthening partners)**

11.1 Which networks are considered strategic for business success? Explain.

11.2 How important is continuity of working relationships with suppliers, customers, business and academic partners?

11.3 How would you characterise the network:  
developing/growing/shrinking,                      stable/changing                      boundaries,  
stable/changing participants?

**12.0 QUESTIONS FOR KEY/PROBLEM EMPLOYEES**

12.1 What motivates you to stay with the company? What makes you doubtful about staying?



12.2 What do you think motivates your colleagues to stay? What has prompted some of them to leave?

### **13.0 GENERAL QUESTIONS**

13.1 Can you describe an example in recent years where the company has faced a major change in the skills or sort of people it needed, or where it has made a significant change in management of your people? How did this come about? What happened?

Has this had any permanent influence on the company and what it does in managing its human resources?

13.2 Can you give any examples where the departure of an employee was viewed as a loss to the firm? Was any action taken? Explain.

13.3 Can you give any examples where the firm succeeded in averting the departure of a key employee? How did this take place.

13.4 Am I missing something?

### **NOTE BENE**

N.B.1 For each section, ask interviewees to identify documents where detailed information can be found. When such documents exist, the interview can focus on general and broad questions (What, why , how). Broad questions will often have to do.

N.B.2 Learn your script, then throw it away in order that the interview can become more like a conversation. Also decide ahead of time to whom you wish to ask sets of questions.