JOURNEYS THROUGH THE QUALITY GAP:

INFORMATION TECHNOLOGY IN TWO ORGANISATIONS

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VOLUME TWO

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NOTE: Some of the Appendices have been modified in order to ensure the confidentiality and anonymity of the sponsors.

A READER'S VISUAL GUIDE TO THE PHD JOURNEY

In order to help the reader keep track of my movements during the PhD journey, a visual distinction has been made between the different sources of information and the different levels of discussion.

Different sources of information appear in the following typefaces:

This typeface is used for ideas and comments arising from background research, subsequent reflections on the research, and general introductions and syntheses.

`This typeface is used for information generated specifically by research within Sponsor A.`

This typeface is used for information generated specifically by research within Sponsor B.

In addition, distinction is made between the four different levels of discussion in the thesis:

FOR THE FIRST LEVEL OF DISCUSSION, HEADINGS LOOK LIKE THIS.

FOR THE SECOND LEVEL, HEADINGS ARE PRESENTED IN THIS FORMAT.

THIS IS HOW THE THIRD LEVEL IS IDENTIFIED.

LEVEL FOUR HEADINGS ARE INDICATED IN THIS WAY.

Bon voyage!

PART

FIVE

CONCLUSIONS AND RECOMMENDATIONS

ROUTE MAPS AND SIGNPOSTS:

CONCLUSIONS AND RECOMMENDATIONS

This chapter begins with a synthesis of the Findings from Sponsors A and B. Issues surrounding the implementation of Total Quality Management (TQM) are found to underpin many of the problems highlighted in both companies. These issues become a focal point in considering the changes required for success in the business market of the future. The chapter continues with an assessment of the research methodology itself, whether it met its original objectives, the compromises that were made and the inherent contradictions.

Since TQM emerges at the end of the research as a key problem area, the work of some TQM 'gurus', plus one or two less well-known writers, is reviewed and a philosophical 'de-coding' undertaken . This analysis illustrates a major theme of the thesis: the dominant influence of the scientific paradigm. Arguing that this dominance is, indeed, an imbalance which has significantly impeded the effectiveness of TQM programmes in the UK, the chapter goes on to develop a more holistic philosophy. In developing this philosophy a major irony is disclosed. The factors which are identified as responsible for the limited success of TQM in the UK are found to be similar to those which contributed to contradictions in the actual research methodology. This realisation leads to a voyage of self-discovery and, in throwing the thesis into sharp relief, signals the closing of the research journey itself.

SYNTHESISING THE FINDINGS

FINAL REPORTS TO SPONSORS

The contents lists of the final reports to sponsors are attached as Appendix 11 and show that the issues which they covered were wide-ranging. However, two key points which flow from the discussion of the Findings will be the focus for the rest of this section. They were human resource strategies and the implementation of quality culture change.

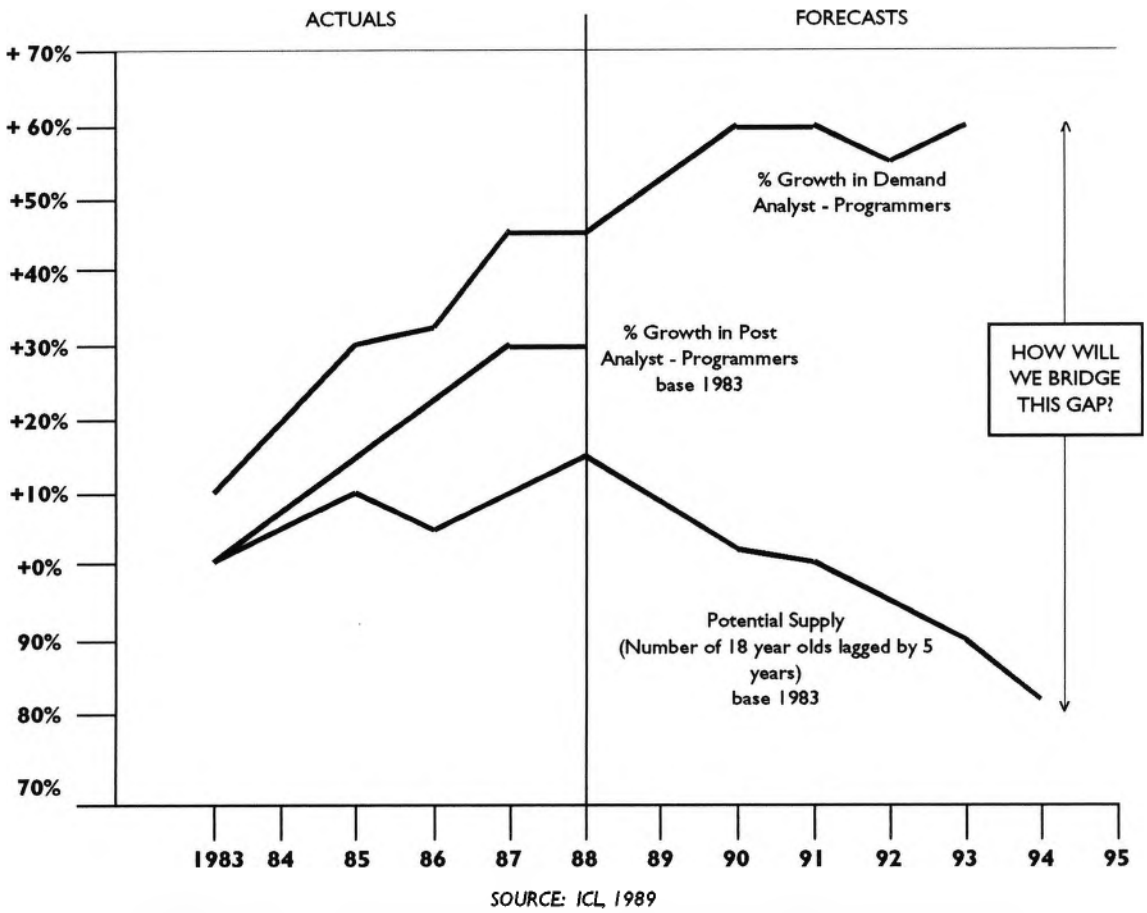
The IT Skills Project had been set up partly in response to a reported IT 'skills crisis'. The following quote summed up the general opinion expressed by those in industry who perceived that there was a crisis:

> *"Before going any further it is worth facing the inevitability of shortages, unless some miracle occurs to reduce the demand for IT skilled staff. ... the demand will grow for many years. For some reason there is an unwillingness for us to face the facts of the demographic trends."*
>
> *(Oakley, 1988)*

The nature of the demographic trend is illustrated in Figures 30-33 (based on talks given at a conference in 1989 on IT skill shortages and the role of women, and sponsored by ICL).

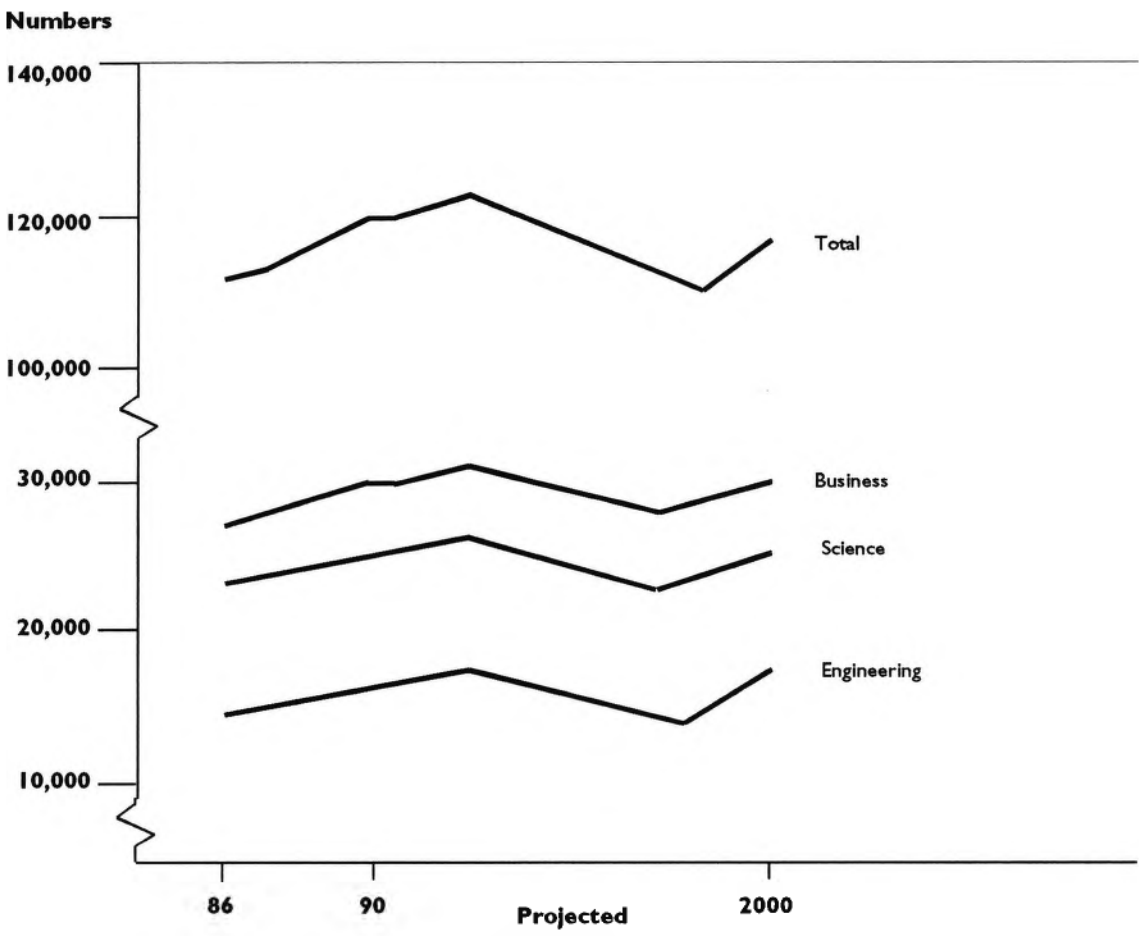
Although the demographic trend seemed certain enough, it detracted from the 'real' issue for me, which, as was indicated in Two Journeys Intertwined, was that the so-called 'crisis' was due to the under-development of human resources (i.e. a skills wastage).

I now believe the subject of demographic trends became a 'hat rack' upon which many people tried to hang their favourite causes. I, too, was one of these, using it to draw attention (as did many others) to the way in which the contributions of some employment groups had been under-valued. These groups included women, 'mature' workers, ethnic minorities, and those lacking a high educational background. The motivation for this was honest enough, but it had the danger of lulling employers back into complacency once



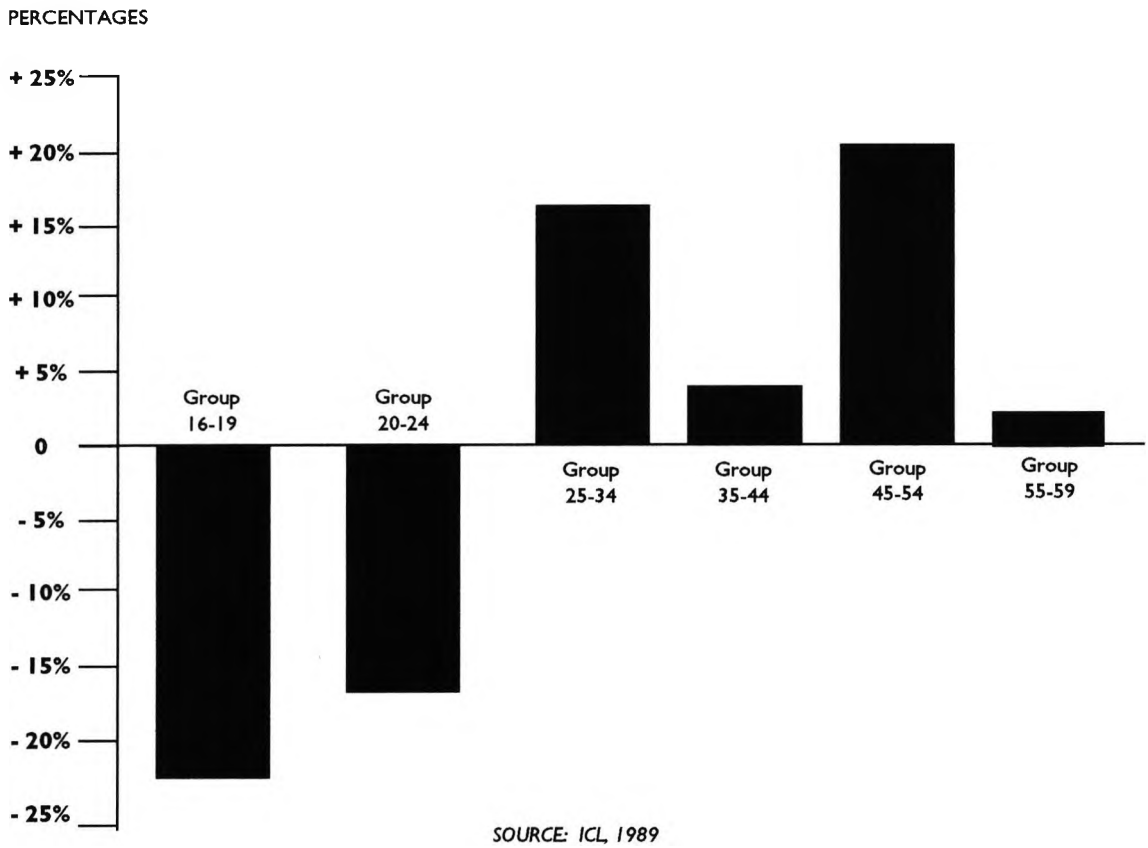
SOURCE: ICL, 1989

FIGURE 30: SHORTAGE OF ANALYST PROGRAMMERS



SOURCE: ICL, 1989

FIGURE 31: FIRST DEGREE GRADUATES: 1986-2000



SOURCE: ICL, 1989

FIGURE 32: UK LABOUR FORCE BY AGE GROUP 1987-1995

	1987 (Millions)	1995 (Millions)	DIFFERENCE	% CHANGE
TOTAL LABOUR FORCE	27.2	28.1	+0.9	+3.4
MEN	15.7	15.8	+0.1	+0.6
WOMEN	11.5	12.3	+0.8	+7.0

Female Labour force increase, mostly due to "returners", represents more than 80% of net additions to labour force.

SOURCE: ICL, 1989

FIGURE 33: LABOUR FORCE CHANGES: 1987-1995

the demographic swing had reversed (Brooke, 1991c). In fact, there was a much more long-term reason than this for changing human resource strategies: the need to maintain quality in the face of increasing competition.

This need was most apparent in the services sector, of which both sponsors were a part. There were several triggers including changes in the law and the coming of 1992's

Single European market. Ironically, this changing environment also presented the UK with the 'miracle' that Oakley had referred to: an economic recession! This unforeseen event had the reverse effect to all previous predictions. Instead of an extensive shortage of IT staff, we were beginning to see wide-scale redundancies, leading to a rise in the unemployment of analysts and programmers.

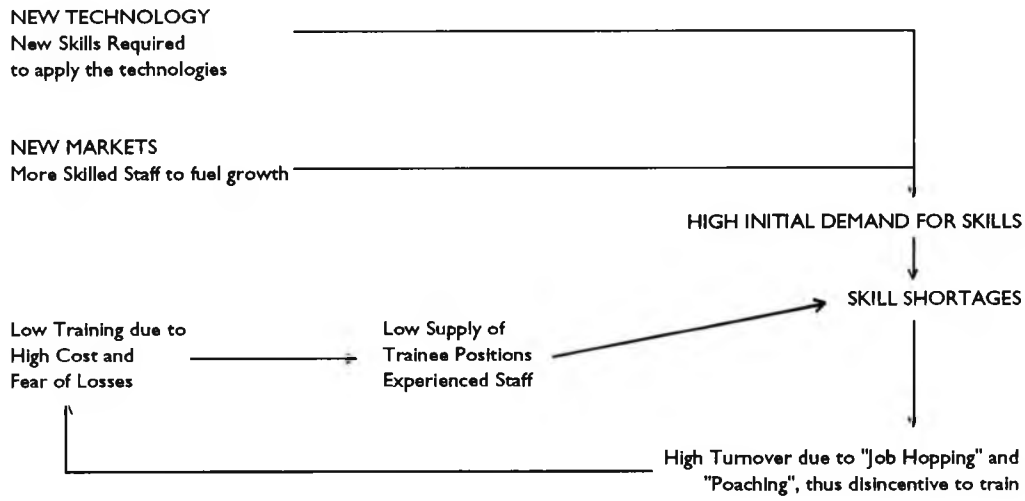
This trend reflected not only an economic recession but also an attempt on the part of organisations to attain quality by being more responsive to customer need. A flatter organisational structure, with fewer links in the managerial chain, was seen as one way of achieving this (Drucker, 1988; anticipated by Barron and Curnow, 1979, p199). The implications went beyond management levels, though. As part of a move towards the quality ethic, a lean organisation was desired, comprising a core of highly skilled staff (Handy, 1988). This meant that all areas of the business, including IT, became subject to scrutiny.

Thus, the subjects of human resourcing and quality culture change were closely linked.

As was discussed in the Findings, Sponsor B had embarked upon a programme of Total Quality Management. Sponsor A had already begun to follow suit and, in addition to the measures reported in the Findings, had initiated a company-wide Health Check shortly after the research was completed.

The importance of both human resourcing and quality culture had been reflected, not only from my fieldwork, but also from thework of the rest of the IT Skills Project (see Appendix 14). So much so, that on looking back, it constituted a change in focus from the specific (IT skills and roles) to the general (organisational culture and recruitment policy). This shift was, in itself, an indication of changes taking place in the wider environment. At the outset of the research the sponsors may have expected to receive low level solutions to their resourcing problems. What they got were recommendations for change of a much more fundamental nature.

Figure 34 depicts the skills resourcing scenario as portrayed by the 'crisis' school of thought and typically referred to as 'The Vicious Circle' (also taken from the ICL conference).



SOURCE: ICL, 1989

FIGURE 34: THE VICIOUS CIRCLE

The main causes of the shortages were shown as an increased demand for new IT skills, a restricted pool of experienced staff, and a disincentive to train due to high staff turnover and 'poaching' by other companies. For a time, this situation was reflected in the marketplace by substantial rises in the salaries offered. Unfortunately, this served to fuel the situation.

Human resource specialists recognised that this circle was self-imposed. They also recognised that the only way to break free of it was to invest in the development of existing staff. The importance of management awareness in this respect was well illustrated in the following quote:

> *"There is no more a 'skills crisis' than there has ever been. The 'skills crisis' is a symptom of the malaise of poor management. People are not born with IT skills - these must be developed as part of the overall pattern of personal growth which continues throughout life."*
>
> *(Cartwright, 1989, p3)*

Responsibility for the perceived crisis was placed on the shoulders of management. It was expected that management would be less than eager to accept this for two reasons. Firstly, it would mean admitting that previous recruitment and training strategies had been flawed and, secondly, it would mean introducing considerable changes for the future.

It was evident from the Findings in Sponsor A that their Systems Approach to Training contrasted sharply with the view expressed by Cartwright above. Its philosophy excluded the 'nice-to-knows', was not flexible, proactive, or forward-thinking in its approach. This was not necessarily an unusual state of affairs, though.

I have argued in previous chapters that organisations in the UK tend to be risk averse, bureaucratic, reactive, and resistant to change; especially the larger ones. The short-termist nature of our society is well demonstrated by our investment practices at the Stock Exchange. What was being asked of management was that they stop viewing people as short-term costs and start treating them as long-term investments. This constituted a cultural turn-around for many institutions and big businesses would find no solace in the new message:

> *"Any organisation that is large enough to profess an IT skills shortage can, if it really wants to, eliminate that shortage. Perhaps it is time that we started regarding a shortage of skills as a particularly negative indicator of organisational worth, rather than the perverse boast that it seems to have become."*
>
> *(Furby, 1989, p20)*

Not only was there a demonstrable need for change but an organisation's willingness to respond to the challenge was also being cited as a measure of its quality.

If people were to become their crucial success factor, who would these people be, and where would they come from?

Traditionally, recruits had come from the younger age groups yet, as was illustrated in Figure 32, these would be in short supply for some years to come, suggesting that

"Systems program building is an entropy-decreasing process, hence inherently metastable. Program maintenance is an entropy-increasing process, and even its most skillful execution only delays the subsidence of the system into unfixable obsolescence."

(Brooks, 1978, p123.)

so long as employers continued to rely on young, new entrants (at any level) they would stand little chance of success (Fennell, 1989).

According to Cassels, 80% of the future workforce was already employed (Cassels, 1990, p27). So the question had to be re-framed. The problem was no longer 'who?' but 'how?'. Once again, the focus returned to recruitment and training practices.

The Findings from Sponsor A, in particular, had demonstrated some of the shortcomings of existing practices. Several potential internal recruitment pools had been neglected as well as external ones.

Inside the organisation, stereotypes existed with respect to analysts and programmers, and a low status was accorded to whole areas of some parts of the business, such as software maintenance and operations. The prevalence of these attitudes, though not unusual (see quote on opposite page from Brooks, 1978), had resulted in the restricted development of individual staff.

One of the specific recommendations made in the final report to Sponsor A was that the profile of Project X be raised within the organisation, thereby helping to combat some of this negativity. This recommendation was taken up, and it was planned to include this in one of the corporate videos being created as part of the quality culture programme.

Outside the organisation, older age groups and those with few paper qualifications were not considered to be the most suitable for IT training. This impacted recruitment by effectively removing these people from consideration.

In order to reverse this situation within Sponsor A, or indeed, within other businesses, a different environment was called for. How this could be achieved would be dependent upon the context. Nevertheless, I believed many of the problems stemmed from a common tendency to focus on the profit motive at the expense (literally) of providing an appropriate environment for the development of individuals.

The old addage 'people are a company's most valuable resource' was being quoted with a deeper sense of urgency. With the shift to people as the key to competitive advantage (over and above the technology itself), a new view of organisations had emerged: the organisation as a learning environment.

The view of organisations as learning environments had been discussed by several people (e.g. Lessem, 1991, Lloyd, 1990; also the increased importance of adult education and re-training, anticipated by Barron and Curnow, 1979, p231).

Lloyd's experience was that:

> *"Few companies appear to have developed comprehensive strategies to overcome these skill shortages, and even companies investing more on training tend to focus on the short term need for technical skills, rather than the longer term development of employees. In the long run, organisations are made or broken not by markets or capital, patents or equipment, but by people."*
>
> *(Lloyd, 1990, p53)*

In the Findings I have used the term 'employee lifecycle' to describe the main ingredient for the new environment. The use of the word 'lifecycle' was deliberate. It was intended to suggest a direct contrast with the previous technological focus on software lifecycles. This contrast was particularly apparent within Sponsor B, where a focus on the procedure-oriented Method B methodology had been applied to the software lifecycle seemingly to the detriment of the performance of the 'actors' on Project Y. It was, therefore, suggested that Sponsor B's interpretation of the Total Quality Management philosophy was flawed. This being the case, what should have replaced it?

By briefly re-visiting the aims and objectives of Total Quality Management, and by establishing some of the cultural traits conducive to its success, I thought it possible to suggest some of the changes that would be demanded of companies in providing an appropriate learning environment and a satisfying employee lifecycle, both of which have been shown to be central to maintaining a competitive advantage.

QUALITY CULTURE CHANGE

Both Sponsor A and Sponsor B were attempting to effect changes in their organisations which would result in an overall increase in quality. Their apparent failure to achieve this was not unique and has been discussed as a general feature of similar attempts within UK organisations (Witcher and Wilkinson, 1990). A major cause of this failure appeared to be the lack of committment to change cultures to the extent which TQM demanded.

This was also supported by the findings from the IT Skills Project Delphi survey, three rounds of which were conducted in 1990/91. Forty-nine of the original participants completed all three rounds and gave their opinions on a wide range of issues relating to the uptake of information technology in the financial service sector up to the year 2000 (Reynolds, 1991a).

One of the questions in the Delphi was:

> *"What percentage of financial organisations' DP/IS departments are/will be committed to Total Quality Management approaches?".*

Although the question was directed specifically at IT departments, the comments which were given to back-up the percentages related to the whole organisation. I have selected some of these in order to illustrate the position:

> *"Without it [TQM] organisations will not be able to survive - their competitors will, c.f. Japan and the Motor Car Industry."*
>
> *"Committed in a verbal sense but total committment is getting everybody involved as in the case of quality circles, the UK is well behind."*
>
> *"Currently a lot of talk, a few gestures but very little action."*
>
> *(op. cit.)*

The cruel irony of these comments was that the respondents appeared to be fully aware of what was required. Yet there was a self-pitying realisation that the UK would

not implement TQM successfully or, at least, not in time. We revelled in our own reluctance! It seemed that our answer to the quality challenge was 'we will hold ourselves back'.

The current level of committment was half-hearted. This was also apparent from the different ways that quality was being addressed inside Sponsors A and B. Sponsor A had not embraced the 'Total Quality Management' slogan to the same extent as Sponsor B. This inconsistency was also spotted by one of the Delphi respondents:

> *"Financial organisations may call it different things e.g. 'customer care', 'quality approach', 'quality service' but these subspecies will grow into TQM by the year 2000."*
>
> *(op. cit.)*

So, a fragmented approach to quality was another obstacle which we had put in our paths.

The reference to Japan in the first of the Delphi comments given above is very significant. The Japanese are generally considered to be the impressarios of quality management; I have only recently discovered that they are also adept at 'Total Quality Learning' (Lessem, 1991). Ironically, it was the Western World that introduced them to the idea (usually attributed to the American TQM guru, Deming, in 1947). Although the UK and Europe were aware of the desirability of a total quality programme, it was felt to be too expensive to implement properly. In the meantime, the Japanese had adopted and adapted our quality concept to suit their own culture, with the result that they had become a strong and impressive competitor. In fact, they continue to outstrip the rest of the business world (Dullforce, 1991). This was one of the major (economic) triggers which forced UK companies to review their cultures.

One aspect to Japanese culture which has been highlighted as a feature of the 'mature' organisation, but lacking in the UK, is spiritualism (Lessem, 1981). This is a point to which I will return later.

The Japanese were not the only competitors to be feared, though. The American's had recognised that it was difficult to change culture and had found another solution. They funded third parties who, unburdened with the history and bureaucracy of the sponsor, could be constantly innovative. This was thought to be especially effective for organisations who tended to be too product-oriented (Flores, 1991).

If British companies were unwilling to make the necessary changes, what was it that they found so difficult to accept? The term 'task culture' had been coined recently to describe the new environment. This quote from Ullah encapsulated many of the important changes that a task culture entailed:

> *"To shape attitudes that result in quality conscious behaviour, we must therefore focus on attitudes towards specific job-related behaviours, rather than general attitudes about the need for quality and the importance of customer satisfaction. This entails individualised communication to the actual tasks people perform, rather than the mass communication of a philosophy. It is in this sense that TQM, if it is to work, must involve everyone within the organisation...*
>
> *One way of increasing acceptance is to set goals participatively rather than imposing them from above."*
>
> *(Ullah, 1991)*

Ullah drew attention to the role of individual attitudes, quality of communications, and participative management. All these were pre-requisites for establishing a shared set of values. Without these, commitment at every level was not assured.

It was apparent that neither Sponsor A nor Sponsor B's quality programmes fulfilled these criteria. The procedural nature of their methodologies and the non-participative way in which they were applied were almost certainly due to their traditional Civil Service-style cultures. They had adopted the 'what' of the TQM philosophy but not the 'how', and, as was discussed in the Findings, it was the 'how' that made TQM so distinct from any previous quality control policies in the UK (Brooke, 1991b).

This distinction was also made by Finlay (1987, p15) in relation to communications technology discourse. Finlay suggested that the 'what' of discourse often claimed to

promote democratic participation but the 'how' hierarchically excluded certain players from contributing. It could be argued that this was the key point which many organisations were so unwilling to accept of their own approaches.

I also noted with interest that the Team representatives from both Sponsor A and Sponsor B identified their organisations with Pyburn's 'written-formal' typology (Pyburn, 1983). The characteristics of which included: formal business planning and top management communications styles, high complexity of the IT environment, low status of the IT manager, and distant proximity of the latter to top management.

Some of the characteristics which I perceived to be synonymous with TQM included openness, adaptivity, autonomy, growth, and re-juvenation. This package contrasted sharply with the established cultures of Sponsors A and B. Gradually, I formulated two different scenarios. One characterised my experiences of the two sponsors I had researched and, as discussed elsewhere, many of the features cited as common to other UK concerns. The other illustrated how I perceived the 'idealised' TQM organisation.

In doing the latter, I also created a vision of the new learning environment.

It seemed appropriate to my research methodology to employ the use of metaphor in constructing these scenarios and, since 'adaptivity' was one of the main characteristics of the new culture, it also seemed appropriate to employ the 'adaptive' form of metaphor discussed by Sackmann (1989).

The metaphor which suggested itself as representing the established culture was the volcano. The volcano model is shown in Figure 35 and illustrates what I see as the core cultural and structural features of this 'traditional' scenario.

The most striking feature of a live volcano is its instability. It is always in a state of turbulence in preparation for an eruption. This response is reactive. The eruptions constitute a major upheaval and the expenditure of a lot of energy. In consequence, eruptions are spectacular (though dangerous), relatively rare, and wasteful.

Volcanoes erupt from their tops and the end product (the lava) is distributed in a top-down way. Harmful gases of sulphur dioxide are emitted into the atmosphere in large amounts. Explosions occurring from ocean floors can contain water, carbon dioxide and oxygen, but even these escape with such force that they give rise to a plume of ash. Volcanic ash gives rise to one of the greatest hazards called 'mudflows', and these can carry off anything in their path. New computer software is proving to be a powerful indicator of volcanic activity. Nevertheless, volcanologists cannot predict the exact timing of an eruption since each volcano is different. Therefore, the consequences for people at the lower levels can be disastrous.

This potential for danger and disaster provokes a risk averse attitude.

I read a New Scientist article on volcanoes entitled "When Sleeping Giants Wake" (Bowler and Joyce, 1991). This seemed an appropriate phrase for the conservative organisation (see also Lessem's discussion of Pettigrew's "The Awakening Giant", Lessem, 1987, pp300-306). In this article it was stated that fast-moving avalanches of ash, pumice and rock were a main killer in Japan (the home of the TQM experts). The piece ended by saying that, even with sophisticated technology, the dangers which volcanoes presented could not be avoided without good communications, trained staff, and education at all levels.

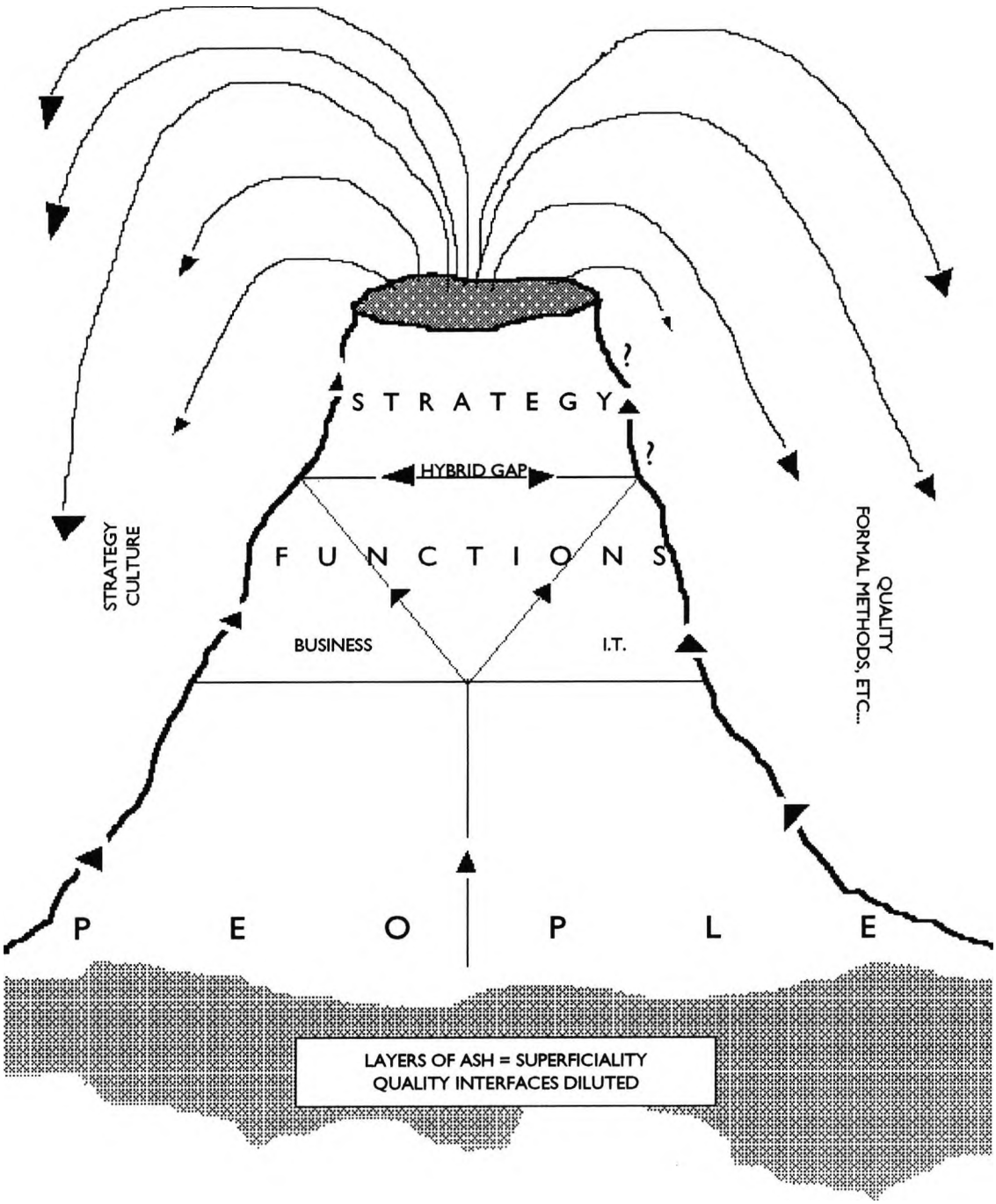


FIGURE 35: THE VOLCANO MODEL

The volcano model is divided into three sections of strategy, functions, and people. The functions layer is divided into IT and business to emphasise the point that they have been separated historically; IT (or Data Processing (DP) as it used to be known), usually retaining some sort of autonomy from other business units. This has given rise to some differences in culture which will be discussed below.

The strategic changes are rolled out in a top-down fashion, although some communication is bottom-up (bearing in mind that volcanic activity does involve the lower levels). There is little interaction between the vertical layers. Career paths are funnelled towards the top of the volcano, giving rise to a hierarchical structure.

This vertical division is parallelled in the horizontal plane, where there is a distinct divergence between the IT and the business staff. Their career paths only meet, if at all, at the very pinnacle of the organisation (Board level). This results in specialists rather than generalists. This 'Y' career path (referred to in the Findings from Sponsor A) produces a hybrid gap which constitutes part of the skills gap illustrated in Figure 30.

Problems of integration occur at several levels. The layers of the organisation are not isomorphic. It is, therefore, difficult for the strategic and the people layers to communicate effectively, and the specialisation in skills presents a considerable barrier to the formulation of cross-functional teams and the transferrance of skills across the company.

Where in-house skills are in short supply, there is increased reliance on outside agencies, such as contractors and out-sourcing facilities. This solution is detrimental in the long term, however, giving rise to a similarly vicious cycle to that of the skills 'crisis'. This is shown in Figure 36.

With a rise in the level of competition in the marketplace, and an increased uptake of IT in the delivery of services, issues of security become a high risk factor. Where there is an increased use of external staff, this also heightens the risk. In the volcano model, responsibility for security is pushed to the strategic level, distancing it from the internal people.

The layers of ash (which symbolise previous eruptions) cover the ground like a superficial veneer. My archaeological background also prompted me to note that this 'dead' ash was one way in which the structure and its surroundings could be dated.

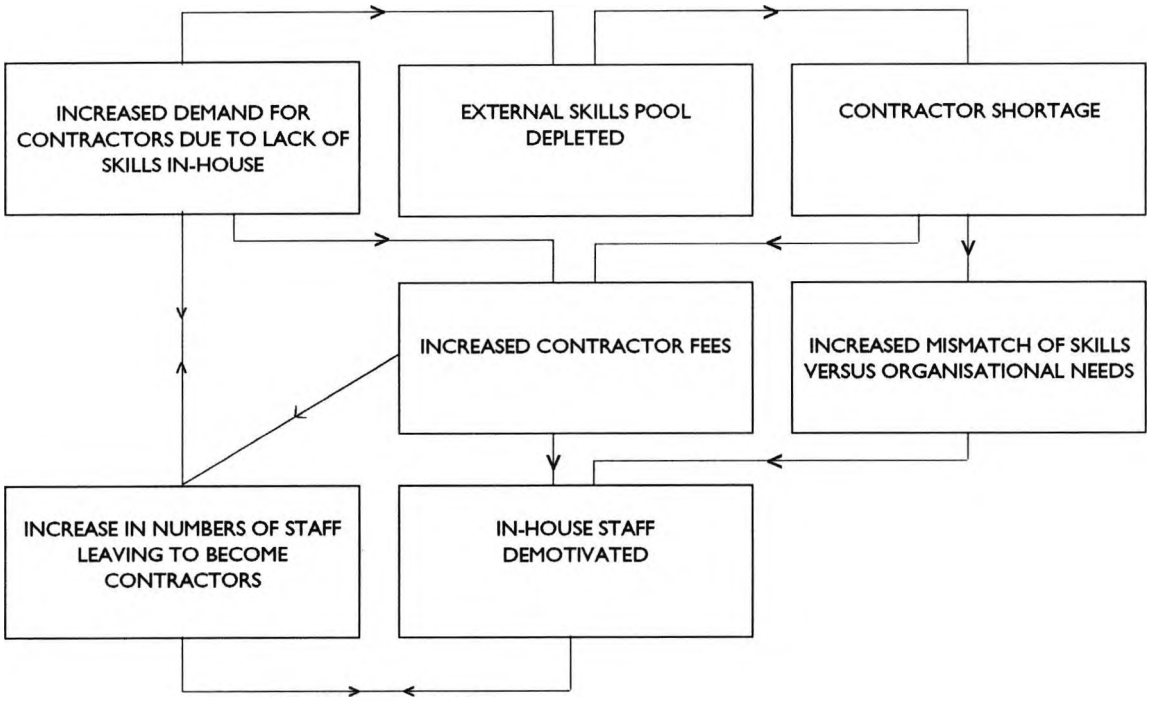


FIGURE 36: THE CONTRACTOR CYCLE

The impact of these characteristics becomes more evident when compared to the idealised TQM model. For this, I chose the metaphor of a tree. The tree model is shown in Figure 37. Since the tree is a symbol of life, it seemed particularly appropriate for making explicit my notion of the employee lifecycle.

The tree implies long-term stability, regeneration, and new growth. The emphasis is on nourishment and a supportive environment. Energy is never wasted. Even when a leaf (employee) leaves the tree, it returns to the soil (the external skills pool) to become a potential source of fertilization, benefitting the tree (and its surroundings) in the long term.

Trees are durable, flexible and very responsive to their surroundings and inhabitants. They provide a channel for the throughput of resources, taking from the external atmosphere (water and carbon dioxide) but giving valuable resources back in return (oxygen). The security of the tree is ensured by this successful throughput. Security, therefore, becomes everyone's responsibility.

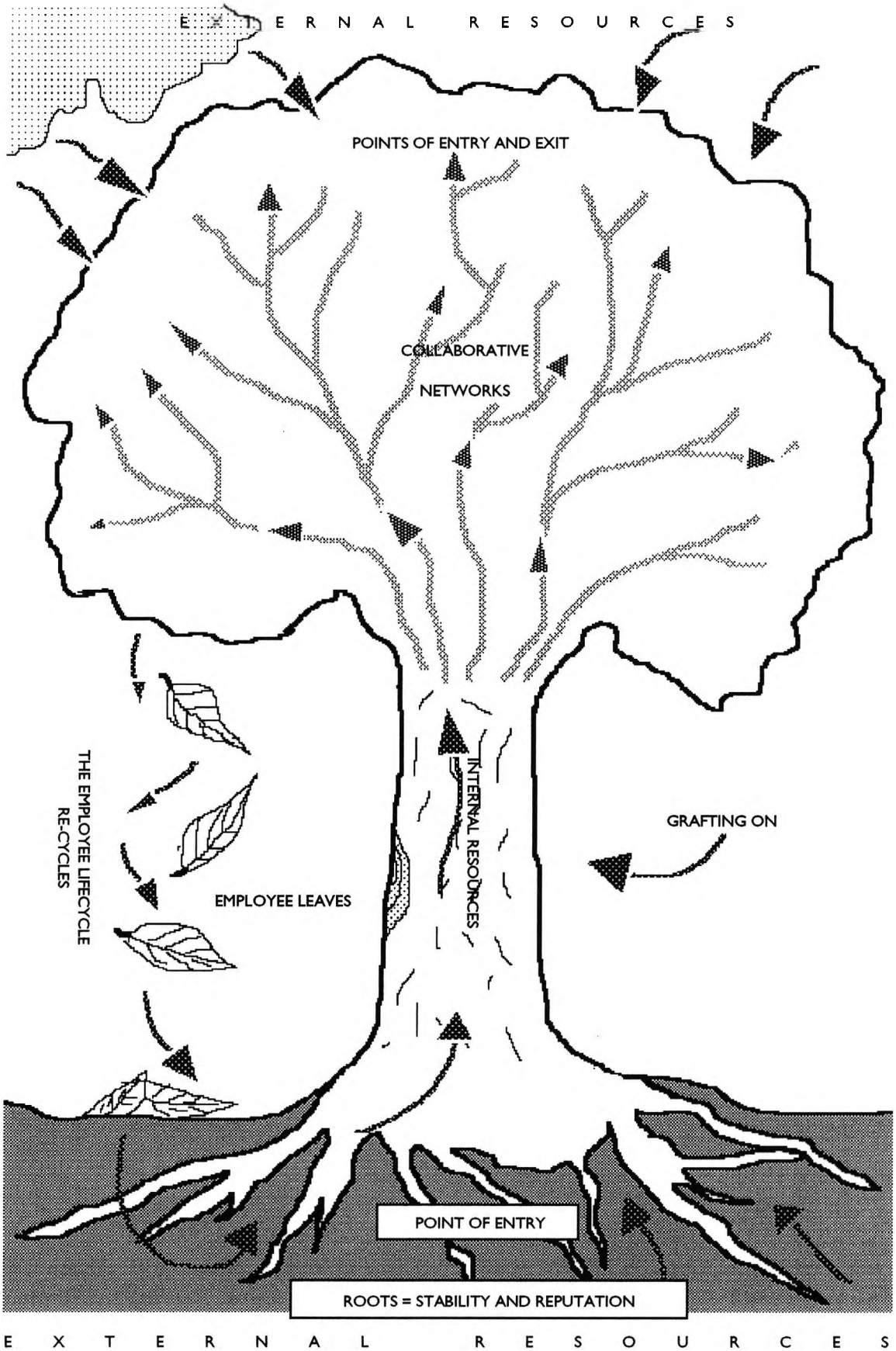


FIGURE 37: THE TREE LIFECYCLE

'Top-down' and 'bottom-up' are no longer appropriate phrases because the tree is a network of branches, twigs, and leaves. There is no distinct hierarchy; components of the network are isomorphic. IT reflects the network structure, therefore, it is not separate but integral to the tree. As Nurminen pointed out concerning the humanistic perspective, the structure of the organisation and the technology by definition become identical (Nurminen, 1988, pp140-143). Change does not imply cause and effect in one direction or the other, but rather an overt expression of one and the same thing.

Growth occurs within all components of the tree. Education and training occur at all levels and paths of development are horizontal rather than vertical. The network comprises interconnections of collaborative components. There is no barrier between IT and the business. Hybridisation has already taken place, melding the two species together. Cross-functional teams (of 'rounded' individuals) are a natural occurrence and so the term itself becomes less meaningful. IT stands for Information Tree not Information Technology.

Grafting-on occurs when additional external assistance is required (contractors, out-sourcing). This serves to emphasise the importance of seeing the leaves as contributing to the external skills pool. Since 80% of the workforce are already employed, the emphasis is not just on employee lifecycles but re-cycles, too; Stephens (1989) called them 're-treads'. This is a truly green scenario. The colour green indicates being in balance with the environment (see Sponsor A Findings and the theme of colour).

The culture is horti-cultural; if you are a good gardener you will establish a reputation for quality. The key recognition is that the quality cycle is the lifecycle of the employee.

The roots of the tree are strong and a testimony to its history yet they support a dynamic, innovative and changing entity. The tree can be pruned, too, without causing long term damage or disturbance; in fact it can enhance its growth.

In contrast to the volcano, the tree provides a dating method which is 'live'; that is, the number of growth rings in the trunk.

The characteristics of the volcano include division, instability, bureaucracy, and conservatism. This gives rise to complexity and poor communications. The tree symbolises integration, harmony, parity, and conservation, implying consensus, holism, and quality communications. In line with the humanistic perspective, problems of complexity are shifted to the problem of linking together personal systems. This is not a problem of systems development, but of organisational co-ordination. Participation becomes a natural necessity and consensus is no longer a barrier. Issues of integration, therefore, are returned to the human environment (Nurminen, 1988, pp140-143).

The idealised TQM scenario puts people at the heart of the matter, and it is to these people that I now turn.

PURPLE PEOPLE

Integration was an important theme in the two models, and it was the integration of IT with business, as much as the integration of people generally, that came to the fore. This re-focussed my attention on the differences that I had noticed in my fieldwork between the culture of IT and the culture of the rest of the organisation. Integrating the IT department meant integrating its culture, too. This issue had been addressed in the final reports to sponsors (see Appendix 11).

Within both Sponsor A and Sponsor B, the IT department was seen by staff as different to the rest of the organisation. At least seven reasons were given for this which were common to both:

1. The business professions had a long history and a reputation for providing its employees with a 'job for life'. The IT profession, on the other hand, had a younger history and staff tended to change employers more often. In consequence, some IT staff felt more allegiance to their profession than to the business.

2. The career structure gradings were at variance. Most trainee analysts and programmers (and analyst programmers) were on a higher grade than many other staff, and this accentuated age differences, too.

3. The IT career path was regarded as a 'fast track' to enable retention of valuable IT skills. However, this notion did not fit in with the existing rigidly defined structures.

4. The business units regarded themselves as generating income and IT as using this up. The role of IT in providing services which underpinned the wealth-generation was often under-appreciated.

5. Both companies had a conservative and risk averse image whereas IT (due to the pace of technological change) was seen as dynamic and proactive in comparison.

6. The overall culture of the companies was described as 'conforming'. As Lawrence said: "No pink shirts or erratic geniuses here." (Lawrence, 1987). Yet this was precisely the stereotype which many non-IT people held of IT professionals.

7. Both businesses were traditionally labour-intensive. IT was machine-intensive. This helped to sustain the idea that status should be accorded to people-management rather than to the management of technology.

It was assumed by many that technology would pervade the organisations in future (perhaps a technologically determinist view), and that this would result in the blurring of distinctions between technical and non-technical roles. Alternatively, the same effect would be seen in the tree scenario above, where the emphasis is on IT being distributed more evenly rather than increasing *per se*. Either way, this blurring would help the integration of IT with the business in purely structural terms but to what extent would it address the cultural issues?

It was clear that IT fitted poorly into the inflexible, reactive culture of the business, and the reason why was summed up in point 5) above: IT was dynamic and proactive. I noted that all the comments were presented as negative but was it not the case (as hinted for Sponsor A in the previous chapter) that IT more closely represented what was needed to achieve full TQM than the rest?! Here, then, was another irony.

This was not to suggest that the culture of IT was an exact template which could be applied liberally. For example, the sharing of knowledge across the organisation would be an important feature, and this was one trait which IT departments had not displayed in the past (knowledge preserves; the 'mystique' of computing). Nevertheless, it prompted me to consider what IT culture had to offer in the way of TQM. In this respect, I noted with interest another comment from the second round of the Delphi forecast (Reynolds, 1991a):

> *"The DP [Data Processing] departments commitment to TQM is essential before any organisation can embark on TQM because of the key nature of DP. DP departments can utilise most of the TQM philosophy without the rest of the organisation."*

The danger of this belief was that too much emphasis was being put on the procedural aspects of TQM but it did support the idea that IT were more amenable to the general philosophy.

In thinking about the culture of IT, I also considered the comments which had been made about personalities, and this brought back to mind the stereotypes within Sponsor A, symbolised by the colours red and blue.

Red had symbolised the traditional management role, and blue the technical specialist. Despite the negativity surrounding the latter, blue was given a higher ranking in the chakras than red (Findings, Sponsor A). It had also been shown to symbolise quality (The Tie Report, 1989). The irony was compounding. Did this mean that a 'blue' culture was the route to full TQM?

The idea of a 'hybrid' role as a solution to bridging the IT/business gap was discussed in the Findings from Sponsor A. A considerable amount of attention had been given by the industry and the media to developing this role because of the need to equip staff with IT skills and to integrate IT with the rest of the business. A Financial Times/ Price Waterhouse opinion survey carried out amongst the UK's top IT directors showed that not everybody felt it merited such attention. As one director said:

> *"The hybrid manager bandwagon is ill-conceived and unhelpful. The British Computer Society is out of touch with reality in its campaign on this."*
>
> *(Cane, 1990, p14)*

The need was perceived to be for a supportive framework rather than the creation of a new work role.

I, too, decided that there was a more appropriate route. The TQM scenario was about integration and parity. That would mean integrating the red with the blue. It occurred to me that if you took the red and the blue and mixed them together you got purple. Purple represented the highest levels of energy in the chakra system. It also suggested a high level of spiritual awareness, and here was the crunch, it accorded more with the Japanese culture. (This idea had also been discussed by others; see, for instance, Lessem, 1981.)

So, by educating and integrating our 'reds' and our 'blues', we would attain a level of success comparable to our strongest competitors. Competitive advantage would come, not from the creation of a third breed called 'hybrids', but through the development of purple people: the truly integrated and rounded individuals of the tree model. The model demonstrated that the term 'hybrid' was meaningless at the individual level. It was the organisation that was the hybrid.

If the UK wanted to succeed, it would have to accept this challenge. If, as was suggested by the Delphi comments, many companies were aware of the fundamental changes required, but were not prepared to implement them, then a logical conclusion was that they did not want to succeed.

ENGAGEMENT

> *"Writing can have no impact whatsoever on our lives unless, as individual readers, we engage with it."*
>
> *(Everywoman, 1989.)*

As you read this thesis you are engaging with the text. It is your act of signification. This process of engagement is essential to the construction of meaning and information. Nurminen (1988) said:

> *"The most important difference between the humanistic and other perspectives is probably the fact that in the humanistic perspective knowledge and information always exist in relation to a subject, a person who 'knows' or possesses that information."*

In Stage Three of my theory journey, I explained at length the reasons why I believed this situation applied within the context of information technology. It is also the same with quality. No engagement, no quality. I have suggested that quality was absent from both Sponsor A and Sponsor B. It could be argued that for both organisations an important contributing factor was the separation of staff from their work amounting to the dilution of engagement.

One of the main themes arising from the research was that the introduction of formal methods had been problematic. These problems have already been discussed but included poor communications, role conflicts, lack of creativity, extended timescales and so on. In this respect, both companies shared the irony of having introduced methods to achieve quality which had apparently served to introduce further barriers to its achievement. What can be gleaned from this?

Upon reflection, it can be see that the individuals were being separated from the object of their labours. Does this sound familiar? The subjects (staff) were being separated from the objects (software). It was a classic positivist scenario. This was no more obvious than when I made an early visit to Sponsor B to see the environment in which new analyst programmers were trained.

I was shown one of the videos which were used in training sessions. The subject matter was the application of formal programming methods. It was quite startling. It highlighted that the methods concentrated on the process of programming. There was no sense of form, of context, of texture. Quality was to be achieved by adhering to a strict code of rules. Creativity was an idiosyncracy linked to individualism, and individualism was to be avoided at all costs.

The theme of control was apparent, as it had been when I had submitted my initial research proposals to the sponsors. The control factor emphasised the importance of separating theindividual out from the task which they were performing. This amounted to de-personalisation, perhaps de-humanisation. It reminded me of Taylorism in its purest form; but had we not moved on from that? Apparently not. Here it was all over again, but cloaked in so-called 'quality' garb. Taylorism in the name of quality. What an awful thought!

Carlopio (1988, pp67-77) described the de-humanisation process very well:

> *"Although we seem to have progressed in the last 200 years from Luddism to unionism, we are still within the same 'mind set' of management versus the workers, the controlled fighting the controlling, that we were in 200 years ago. It is this 'cultural conversation' that we are, which keeps management from seeing the long-range benefits to treating workers as their most valuable partners. Management needs to see that it is wiser to devise production systems that make use of the flexibility and intelligence of people than it is to try to design all the 'life' out of production."*

The last point, in particular, accorded with the view of formal methodologies as suggested by my fieldwork.

I further reflected on how this situation squared with my philosophical belief system. In order to present this, I will need to briefly review two points which were covered in the chapter on theory and methodology.

During Stage Two of my Journey Through Post-Processual research I encountered structuralist archaeology. Structuralism employed the analogy of language and semiotics in the construction of meaning. Semiotics involved the interpretation of signs.

Anything could be a sign but it was the relationships that made up the process of communication which resulted in the phenomena called signs. Wherever there were signs, there was potential meaning.

A sign consisted of two main components called the signified and the signifier. I repeat below the diagram which illustrates this:

SIGN	SIGNIFIER	SIGNIFIED
The thing itself	Relates to the senses and acts as vehicle to the signified	Relates to the intelligence and represents the meaning of the signifier
Let us suppose the thing which we want to symbolise is a tree	Let us suppose the signifier used is the written word:	The word "TREE" might be de-coded as:
	"TREE"	

I framed the quality methods in Sponsor A and B in terms of this communication arrangement of sign, signifier and signified. The tree sign in my diagram became the Quality Tree, the methodologies became the vehicle for its achievement (i.e. the signifier), and in the context of analysts and programmers this was decoded as the resulting software program (the signified).

Looking at this arrangement it became clear that what had happended within both companies was a focus on the signifier at the expense of both the sign (Quality) and the signified (the resulting software program). The conceptualisation of quality -the whole purpose of the signifying act - was devalued. There was a deeper message here about the quality of relationships between people and technology. As Pirsig (1974) had said, it was not the technology itself that was ugly but the relationships involved. Understanding how this devaluation came about requires further consideration of the problems inherent in interpreting signs.

As shown in the diagram above, and pointed out in my account of Stage Two, a structuralist analysis of communication left room for ambiguity and this ambiguity appeared to contradict the notion that there could be a rule-based method of constructing meaning. This concern with rules was echoed by what seemed to be a concentration on the structure and system of communication (the 'langue') rather than on what was actually being expressed (the 'parole'). Structuralism assumed that the langue determined the parole and, therefore, the language code effectively determined the actor, rather than vice versa.

In applying such rules, structuralism was unable to deal with contextual dependency; that is, the possibility that meanings changed depending on the context in which the signs occurred (polysemy or multiple meaning). Also, meaning through action was potentially missed.

I realised that this was exactly what Wittig (1978) had been trying to say in her discussion of computer-based criticism (see the section on Similarity and Difference). I shall repeat her argument so as to facilitate the comparison. She said that computer-based criticism was:

> *"...directed to the message itself, cutting off from consideration the larger context of the literary communication, the larger context of the signifying act... Indeed, the focus is so sharply delimited that it can be said to virtually ignore the sign as a component in the signifying process and to concentrate instead on the features of the signal and the signal system..."*

The signal and the signal system here equates with the vehicle for quality - the methodologies. In this context her argument underlines the tendency to ignore quality and focus instead on the process of achieving it i.e. the methodologies. The fieldwork showed that both sponsors had implemented their methodologies in heavily quantifiable ways based on documentation and rule-bound formats. These were the features of the signal and the signal system. In fact, it could be argued that theserules and procedures actually represented quality as they perceived it.

Witting then went on to say:

> *"...each receiver... organises the text out of their own system of values... The text, then, becomes the projection of their individual ordering processes; their reconstruction of the received signal, their act of signification, their foregrounding processes. It becomes meaningless, then, to talk of the text, autonomously, as signal; we can speak only of the reader's act of achieving signification."*

How much more meaningless to talk of quality in isolation from the individual's act of achieving it! But it was not the individual or individual actions with which these methodologies were concerned. If we extend the metaphor of text in her discussion slightly to the text (the documentation) itself of the formal methodologies, the point becomes even more apparent. How could quality be achieved when the reader of the text (the individual) was given no role in its interpretation? Was this not a denial of the analysts and programmers in their acts of signification?

Mark Twain has been quoted as saying:

> *"Training is everything. The peach was once a bitter almond; cauliflower is nothing but cabbage with a college education."*

It was interesting to contemplate the effect this denial would have in respect of technical training. Sponsor B's videos have already been mentioned. For Sponsor A, the Systems Approach to Training comes to mind. As Prasad (1990) said, technical training involves domains of meaning creation, and this requires acts of signification. If the companies were employing a philosophy which denied this then failure to achieve quality might also be reflected in their training. (I noted that training provision for the implementation of TQM itself had been criticised by the staff notably, as was discussed for Sponsor B, for being too little, too late and for not allowing greater participation.)

I saw this denial as an example of the neglect of the individual in the context of technology application. This was what I had originally set out to balance in my own research - by adopting a more individualistic approach. I also saw it as a denial of the socially mediated nature of information. Inherent in applying such detailed, rule-bound

methodologies was the notion that everybody who read the documentation would interpret it and convert it into action in the same way. Otherwise, how could quality in their terms be achieved? There would be no consistency, no sameness, no predictability and, of course, no control.

There was no room here for variability. The fact (of quality) had to be divorced from the values (of the individual) so that control could be maintained. This was a positivist philosophy (see Figure 38).

The formal methodologies attempted to separate the individual from the software product itself. In so doing, it separated the reader from the message, the crafter from the craft, and the subject from the object. Here was the quality gap. Holism had gone out of the window.

> *"At the level of dominant culture, we are supposed to believe that scientific knowledge is the only knowledge real and worth having; that analogue knowledge is non-existent or inferior; and that fact and value have nothing to do with each other."*
>
> *(Berman, 1981.)*

POSITIVISM

THE FACT OF QUALITY OBJECTIVITY

ONTOLOGY

EPISTEMOLOGY

SEPARATION

AXIOLOGY THE VALUE OF QUALITY SUBJECTIVITY

HOLISM

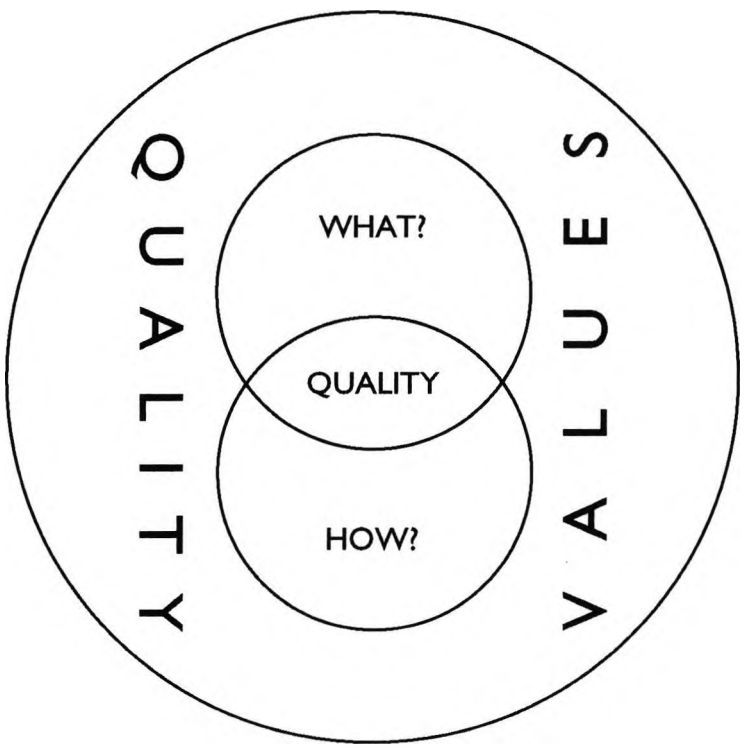


FIGURE 38: POSITIVIST VERSUS HOLISTIC QUALITY
(c.f. Figure 1)

THE QUALITY TREE

> *"In a traditional and hierarchical organisation employees are treated as being objectively measurable and, in return, they give of their bodies without giving of themselves. There is no quality to be seen anywhere."*
>
> *(Lessem, 1991, p13.)*

Just as formal methodologies served to separate the individual from the software product, so the volcano model separated the individual from the company itself. It was impersonal. In contrast to this, the tree model emphasises engagement and participation. That is why the focus shifts from software lifecycle to employee lifecycle. The implications for employers are profound.

No longer can technologies be thought of as distinct from the people that use them. In more recent years, it has been fashionable to encourage user-centred design and application of technology. This was discussed elsewhere in the thesis but it is important to re-iterate here that such an approach shifts responsibility to the arena of employer ethos and ethics.

Ethics have always been central to the concerns of humanists. In relation to technology and its application, the attainment of quality in humanistic terms means that the individual and technology are identical - no separation of subject and object here. Just as Nurminen (1988) said of organisational structures, they are expressions of one and the same thing. The tree model (Figure 37) shows the inter-personal nature of the relationships. (This is one reason why inter-personal skills have become more important in recent years than pure technical skills.) Separation is no longer the raison d'etre and holism has creptback through the window.

It occurs to me now that I have fulfilled one of the objectives I set out in Stage Three of my theory journey. That is, to take account of the role of ethics as well as how the dominant management paradigm influenced the development of IT and IT workers.

Naisbitt and Aburdene (1990) said:

> *"The very nature of an information economy shifts the focus away from the state to the individual. At once, as we globalize our economies, individuals are becoming more powerful and more important than they were in the industrial era."*

This quote emphasises the importance and power of the individual which is at the heart of the tree scenario. There is a need to re-focus from high to low level, from short to long term, from profit to investment, from quantity to quality, from fact to value. If information is the product then people are the key producers, not the technology, and the two cannot be separated.

COMMENTS ON THE RESEARCH METHODOLOGY

There were two main questions which I addressed after the research was completed and which are considered below. These were: did I address the issues originally outlined in my proposals to the sponsors, and did I fulfill the IT Skills Project's overall objectives as outlined in the Information Sheet?

DID I ADDRESS THE ISSUES ORIGINALLY OUTLINED IN MY PROPOSALS TO THE SPONSORS?

This question was especially pertinent bearing in mind that my research methodology meant I was guided by what the people I spoke to said was important, rather than just the pre-research briefs.

As was discussed in the Journey Through Two Organisations, the research proposals to Sponsor A and Sponsor B contained examples of general and specific findings to be addressed by the research exercise. However, the examples given were different in each case.

Sponsor A

FINDINGS SPECIFIC TO PROJECT X: TECHNOLOGICAL DISTRIBUTION AND FUTURE SKILLS

The study showed that Sponsor A was conducting their own research into potential/future technology within their organisation, both in terms of changing their working practices and in terms of producing new products for their customers. They were well aware of the major associated issues. The situation concerning the current use of technology within the company was, however, less well acknowledged. It was this scenario which concerned staff most and which manifested itself in the final report.

Nevertheless, staff also had clear views on where the technology would take them in the next 5-10 years, and how it would affect their roles within the organisation. Consequently, everyone had something to say on what the skills effects would be and there was strong agreement on the overall trend for analysts and programmers (reported in the Findings). A glance at Appendix 11 shows that the final report covered the technology and skills issues in a number of sections.

FINDINGS GENERAL TO SPONSOR A: OBSERVATIONS RELATING TO SKILLS ISSUES AND THE TAKE-UP OF TECHNOLOGY WITHIN THE COMPANY

These findings really led on from the above points. An interesting comparison was enabled after the work conducted within Sponsor B. Whilst Sponsor A employed analysts and programmers and were only just considering introducing a new job title of analyst programmer, Sponsor B had only analyst programmers.

General observations were possible by comparing the two organisations in terms of how the staff saw their roles, skills, and personal profiles, and how they felt they fitted into the company as a whole. It transpired that there was conflict between the analysts and programmers in Sponsor A, and between development teams (such as Project Y) and the technical support teams in Sponsor B.

Sponsor B

The specific and general findings which were listed in the proposals to Sponsor B were different to those for Sponsor A. There was more emphasis on recruitment, training and retention. This reflected the importance of the lifecycle of the employee as it had emerged from the first study and a shift away from the 'hard' areas of technology towards 'softer' issues.

My experience at this stage suggested that in order to understand what technology and skills would be of importance in future, the whole arena of an individual's entry into, and exit from, an institution had to be examined. This included how people were selected, trained, deployed, and their personal development. This scenario is particularly evident from the Tree Lifecycle which was presented in Figure 37.

FINDINGS SPECIFIC TO PROJECT Y: TRAINING AND RETENTION OF CURRENT PROJECT STAFF AND FUTURE SKILL NEEDS OF THE AREA UNDER STUDY

The research indicated that a major training need was in the area of Total Quality Management. It was clear that the manual-based implementation of TQM was inappropriate.

Although staff had their own ideas on how skills might change in future, especially as a result of technological developments, their prime concerns related to the culture of the organisation, its structure, and its communication channels. Whilst the final report contained a similar coverage of skills issues to Sponsor A (see Appendix 11) this resulted in a significant part of the content being focussed on quality: quality of work, quality of process, and quality of communications. It was these areas which were highlighted in the Findings.

FINDINGS GENERAL TO SPONSOR B: RECRUITMENT ISSUES FOR TECHNICAL STAFF IN GENERAL AND THE FUTURE ROLE OF ANALYST PROGRAMMERS WITHIN THE ORGANISATION

Since TQM was an organisation-wide concept, it followed that the general findings, too, were centred on its implementation and success (or lack of it). Staff were unhappy with the way in which change was being introduced and this focussed their minds on the here and now rather than the future. This meant that employee lifecycles took precedence over considerations of future roles of analyst programmers, particularly since several members of Project Y were already considering leaving the company.

Once again, although ideas concerning the future received attention in the final report, the importance of the cultural issues resulted in this being the core feature of the findings.

THE CULTURE FOCUS

On reflection, then, the final reports did include findings which could be categorised as specific and general, and which focussed on issues of technology and skills. However, the area which both studies highlighted most strongly was culture, and yet this subject had not appeared in any of the research proposals.

Culture was implicated in a number of different ways: the methods employed to introduce change, the apparent mis-match between perceptions of the 'higher' and 'lower' levels in both organisations, the apparent contrast between the culture of the sponsors and the culture of IT, the rivalry and conflict between roles and departments, and the nature of employee lifecycles.

Many of my preconceptions about the research involved cultural considerations (see, for instance, the lists produced for Sponsor A, reported in the Findings). Yet, I also believed that evaluating culture was a personal and emotive process and that, had culture been incorporated in the proposals, they would have been rejected. Of course, I could be wrong, and if I were to repeat the exercise, this would be another aspect which I would check carefully with each organisation before making any assumptions.

It occurs to me now that one reason why a cultural study might have been found unacceptable at that time was that it would have been less easy to quantify and, therefore, was less controllable. The subject of control and the importance of the quantitative theme are discussed further below.

DID I FULFILL THE OVERALL OBJECTIVES OF THE IT SKILLS PROJECT?

According to the IT Skills Project Information Sheet, the broad objectives of the research project were:

> *"Identifying future IT skill needs with a view to enhancing the competitiveness of City-oriented organisations. The research will help to ensure that organisations are geared to make the most effective use of human resources and IT in implementing their business plans."*

To what extent had my research fulfilled these criteria?

I found it easiest to assess this by breaking down the objectives into what I saw as the three main points of:

- Identifying future IT skill needs
- Enhancing the competitiveness of City-oriented organisations
- Making the most effective use of human resources and IT

IDENTIFYING FUTURE IT SKILL NEEDS

The final reports to sponsors contained sections which highlighted the perceived skill requirements for the future, both for specialist IT staff and for future recruits in general. The latter point was particularly important in the light of one of my major conclusions: that there would be a greater emphasis on 'rounded individuals' (purple people) and, hence, on personal and business skills, rather than just technical skills *per se*.

In short, focussing only on the technology, rather than the people, was non-productive. It may be that those administering, and involved in, the IT Skills Project anticipated the findings would be concerned mostly with technical skills. However, the

repertoire of skills required in IT in future was likely to include a large number of those currently identified in non-IT areas; signalling an end to the historical myth and knowledge-preserve of IT.

ENHANCING THE COMPETITIVENESS OF CITY-ORIENTED ORGANISATIONS

Both the organisations I researched were City-oriented in the sense that their Head-quarters and their IT departments were in London.

The concept of competitiveness was a somewhat value-laden one. Different people viewed competitiveness in different ways. For those who liked the quantitative ap-proach, the most obvious measurement tool was total profit. One way of measuring the effects of the research in this sense, was to compare the projects' balance sheets before and after the study! Most people, though, would agree that this was a meaningless exercise for a number of reasons. For example, how could it be deter-mined whether it was the research that had effected a change and not some other factor or factors?

Perhaps the most valid objection to this form of measurement was that there were many ways in which a contribution could be made to the overall success of a busi-ness, without it being directly quantifiable. Since the prime outcome of my work had been cultural, the contributions made by my research were, by and large, of a qualitative nature.

My research approach had been centred on individuals and had tried to bridge the gap between them and the overall business structure. In both sponsors the gap was primarily a communications one. I felt my research provided an opportunity for the upper hierarchy to take account of the thoughts and feelings of staff at lower levels in formulating their future plans.

There was a more general way in which research made a contribution, too. This was to the extent that organisations not involved in the IT Skills Project would be able to use our findings to their own benefit. To this end a report was prepared by the Team for public sale.

I have already said that the research demonstrated that the major skills issues for consideration were not to do with specific technology. It is interesting to note here that it was a conscious decision of the Research Team to put the phrase 'human resources' before 'IT' in the stated objectives. The Research Team felt that the emphasis should be on people, since it was their skills which we would be investigating and not the technology's. This bias reflected the mainly human resource management background of Team members.

The fact that the people assigned to work on the Team were not technical specialists (including the sponsors' representatives) illustrated that the image of the project was always seen as being human resources-based. It was unsurprising, then, to find that the results of the research had a more general relevance. Although my work was with analyst programmers, the lessons learnt from it had potential relevance for many organisations; as was borne out by the Delphi study (Reynolds, 1991a).

The observations made during the research had implications for recruitment, training, retention, and career structures. By focussing on people, rather than on technology, the core concern became, not the software lifecycle but, the employee lifecycle. This meant that my exploration extended into terrain which some management felt to be of irrelevance to the study of IT skills. It was seen as uncomfortably pervasive. As Sponsor A put it, I appeared to have overstepped the boundaries; although it was admitted that those boundaries had never been pre-set or agreed upon.

It was interesting to compare the pervasiveness of my research with the pervasiveness of IT. I believed the common theme here was control. It could be argued that fear of IT was often rooted in a fear of lost control; on the part of organisations, groups, and individuals (see the Journey Through Two Organisations and Appendix 3). The sponsors may have been questioning to what extent they had unwittingly lost control over my research. Myfeeling was that, by definition, a study of how to make the most effective use of human resources (in whatever area of the business) was an all-encompassing one.

The dilemma of the quantitative researcher:

"The data you have are not the data you want, the data you want are not the data you need, and the data you need are not available."

(Taylor, 1990.)

The proof of the pudding, as they say, is in the eating. The criteria by which I judged the usefulness of my research for the sponsors were the responses and reactions of those who took part in the research, those who took responsibility for accepting the reports, and the events that have taken place since the findings were synthesised by them (see Feedback).

FEEDBACK

Feedback was an important element in the research. Indeed, it was one of the main 'validating' mechanisms at the time. Feedback on my research came from two main sources: the staff and management in Sponsors A and B, and the IT Skills Project Research Team. The latter consisted of informal feedback as well as formal meetings. These meetings took place as part of the overall research schedule and so my work was only one of the items on the agenda. Nevertheless, I obtained ideas on areas which my study might explore and pointers to accounts of work on similar topics.

My PhD supervisor was a member of the Research Team and so the feedback I received from him came from more than one dimension. When discussing the thesis as a piece of academic work, I felt our perspectives were very different. I sometimes felt as if I was trying to fulfill positivist expectations. This feeling of working in a positivist atmosphere is reflected in more detail below. As an empirical piece of work, however, the research was assessed against the objectives and timescales agreed with the sponsors. Thus, it became a prime concern to gauge the reactions of the two host sponsors, and it this feedback that I report next.

Sponsor A

The staff responded to the presentations with positive comments. The final report to the management was also well received but one observation was made which it is important to re-iterate.

The senior manager (from IT Personnel) who received the report felt that the issues it covered extended beyond the 'boundaries' expected

of the study and into some 'irrelevant areas' (e.g. staff accommodation); although these boundaries were never pre-set or agreed. My university colleagues, the Sponsor Representative, and other staff from Sponsor A commented that this reaction was typical of his management style - exceedingly risk averse. I believed it was also due to the overall culture of the organisation, there being a feedback relationship between the one and the other. I interpreted his response as a concern that he had not maintained clear control of the research. (The role of control was discussed in Two Journeys Intertwined; see 'A Research Strategy for the Study of IT'.)

Although this reaction was partially understandable, given the context, the implications were rather depressing. It indicatedthat there was a lack of appreciation for the importance of the individual employee lifecycle and the relevance of associated issues to the future success of the organisation.

The content range of my report was borne out by the existing literature. For example, a report by the National Computing Centre stated that:

> *"...the wide divergence of views on skills shortage was less to do with numbers potentially available nationally but much more directly related to:*
>
> *a) geographical location and local potential availability;*
>
> *b) recruitment policies;*
>
> *c) the skills required;*
>
> *d) the ability to provide training whether in-house orthrough outside agencies;*
>
> *e) remuneration, working environment, conditions of service and career prospects."*
>
> *(NCC, 1990)*

and it then went on to discuss many of the points which were set out in my own report. I knew that the work of the NCC would be considered by the sponsor as an important 'thermometer' of the situation in general. Since I had recognised similarities between my findings and this report, I decided to send the senior manager a copy of the NCC's management summary for him to consider in conjunction with my report. I have reproduced below part of his reply:

> *"I feel all working on the project [i.e. the Team] can take credit for the conclusions coming so close to the views expressed by prominent membership of NCC.*
>
> *...although wider than we had initially envisaged, [your report] has highlighted many issues that are receiving attention, albeit not necessarily triggered by your own report. ...What it does show is that, through the limited experience you have gained from working [with us], you have identified positively issues that are critical to our success, and I take this opportunity of thanking you again for the contribution you and the Project Team have given us."*
>
> *(Letter dated 11th March, 1991.)*

This letter brought an admission of the relevance of the scope of the report. However, I noted his qualifications 'albeit not ..." etc. Once again, I realised how a more collaborative approach on my part could have helped my work to be seen as part of the organisational strategy rather than as a separate issue.

One of the most obvious differences in perspective between thismanager and the staff on Project X related to the last item in the NCC list: working environment. The first problem which the staff had selected for their Quality Service Action Team to tackle was that of accommodation. Yet it was precisely this subject which the senior manager had regarded as irrelevant to a consideration of IT staffing!

I did not agree with this, though, and noted the apt title of an article by Clegg and Kemp: "Information Technology: Personnel, Where Are You?". The main thrust of this paper was:

> *"The personnel function should not be passive and reactive ... but should become proactive and directing, thereby influencing system and organisational designs with a view to improving individual and organisational well-being and effectiveness.*
>
> *... The time is now ripe for personnel specialists to influence the design, operation and evaluation of IT by adding the human side to current technical considerations. Put more bluntly, it is time to step into the kitchen, even if it gets a little hot."*
>
> *(Clegg and Kemp, 1986)*

It was, therefore, with great interest that I discovered Sponsor A had instigated a 'Health Check' (an organisation-wide re-assessment of human resource strategies) after the research had finished which, apparently, was intended to address many of the areas which were raised in the final report. A more collaborative approach could, again, have helped me to understand more clearly the relationship between my work and theirs (they would effectively have been part of eachother).

Sponsor B

I was pleased that the senior manager responsible for accepting the final report agreed with the points it covered. He had only one objection: the centralisation of resources. I had presented an argument in favour of de-centralisation. He believed it was more the way in which it had been implemented that was at fault.

He made a number of comments on how Total Quality Management could have been more effectively introduced, and these were included in the Findings chapter

('Reflections on Total Quality Management'). He also undertook to pass copies of the full report to his senior staff, and to circulate the management summary to all project managers in his division. This was a more proactive response than Sponsor A.

THE PROCESS OF FEEDBACK WITHIN ACTION RESEARCH

The period of feedback stretched right from the beginning of the research up until the moment of setting it down in this thesis. The main reason for this links into the Action Research approach of the IT Skills Project Team. Cassell and Fitter's use of action research was discussed in Similarity and Difference and I now return to their treatment in order to consider the processof feedback. As they said:

> *"Feedback is crucial in order that action can be prescribed or goals modified based on information that an evaluation can gather."*
>
> *(Cassell and Fitter, 1989, p11).*

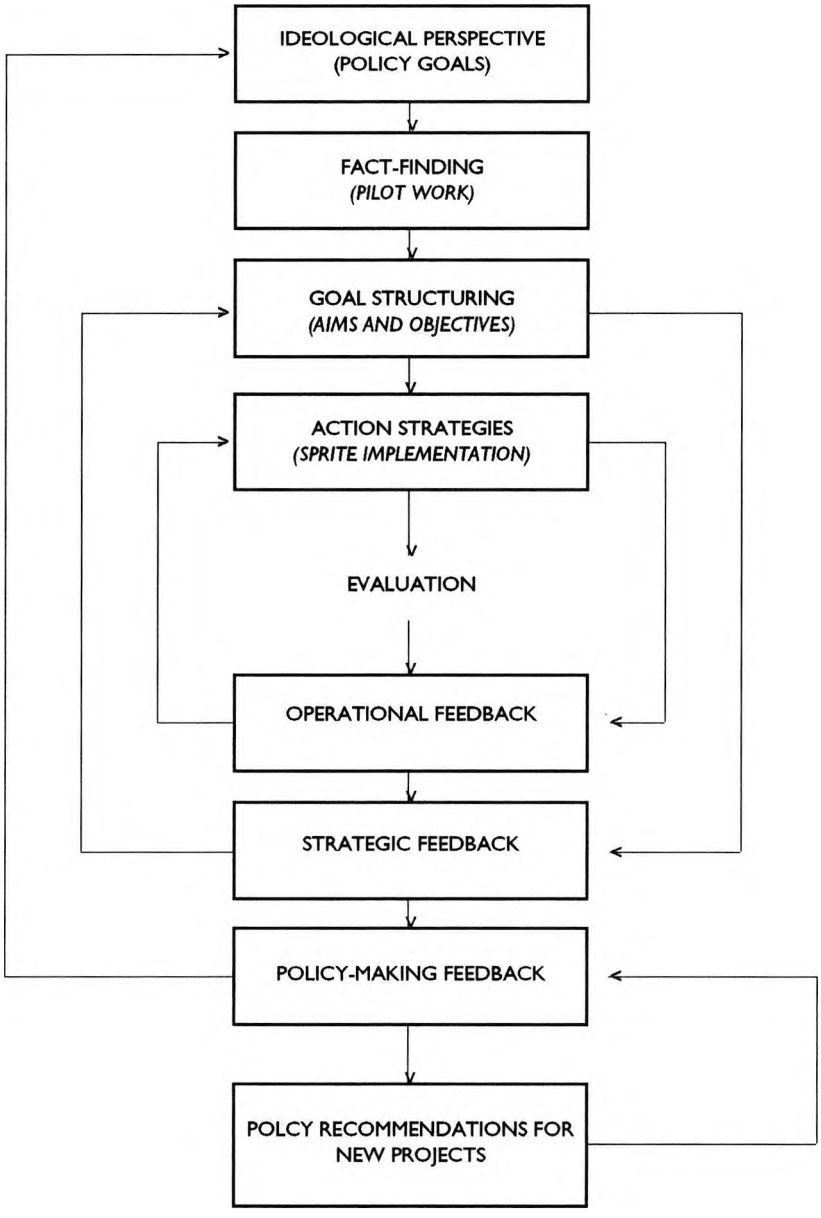
Figure 39 is reproduced from their discussion and illustrates how they incorporated feedback into the Lewin-based action research model (previously shown in Figure 20).

They identified three types of feedback: operational, strategic, and policy-making. Each of these types implicated different groups of stakeholders. Operational feedback involved the project workers (clients), strategic feedback related to the management committee (service providers), and policy-making feedback came both informally from the sponsors and formally via the Steering Committee.

It would be difficult to divide the participants of our IT Skills Project so neatly into the three groupings. Although my own research had not been collaborative, I believed that at the level of the IT Skills Project overall framework, it had been. There was a Steering Committee set up to oversee the running of the work which met fairly infrequently, and this could be equated with the policy-making level. However, the integration of the sponsoring organisations with the academic researchers at all levels meant that the parties had direct input and influence concerning the overall direction of the research; right through from the policy goals to recommendations for new projects, as shown in

Figure 39. Therefore, it is not possible to distinguish the others involved in the research in terms of being at either 'strategic' or 'operational' levels. However, action research did not have explicit consideration for the individual actors in the research - especially those within the context being studied. Thus, whilst it could be argued that collaboration took place at a level that satisfied action theory criteria at a very simplistic level, it did not take place at a level that satisfied the notion of full participation.

As I reflected on my experiences, it occurred to me that the integrative character of the work at least partly accounted for the many different roles which I felt I had played in it (see A Traveller's Reflections).



BASED ON CASSELL AND FITTER, 1989

FIGURE 39: FEEDBACK LOOPS

THE QUALITATIVE-QUANTITATIVE PHENOMENON: A DILEMMA

The qualitative-quantitative phenomenon constituted a dilemma for me. It was an aspect of the relationship between myself and the sponsoring organisations. Although it did not account for the totality, it was an important part of my field work experience and, as an influence on my methodology, required further consideration.

Re-reading the research proposals for Sponsors A and B revealed a 'masking' trait, expressed in the form of compromise. This compromise was manifest in the process of attempting to meet thepolitical needs and expectations of the sponsors. It could be argued that this was an inevitable factor in the context of organisational research. Compromises over the format that research will follow are frequently addressed in projects undertaken by academic-industrial partnerships. I believed that the nature of my compromise was more fundamental than this, though.

It resided in the essentially qualitative nature of my research approach as against the quantitative frameworks of understanding which characterised the sponsors. It was not just a consequence of practical business constraints but also a symptom of our different perspectives on the importance of the individual in the business context. Businesses overwhelmingly regarded people as a cost, not an investment, particularly in respect of training and self-development (Benjamin and Benson, 1986). This was one of the ways in which my approach differed and was expressed in the Findings.

The qualitative-quantitative dilemma proved to be a very valuable learning experience for me. It was a theme which resonated throughout my Journeys Through Post-Processual Research and Two Organisations. At first I found this disconcerting, even de-motivating, but I came to realise that it was an essential part of travelling through a PhD. Indeed, it presented challenges which helped me to formulate and refine my research approach - essentially through modification and compromise. I was constantly struck by the need for a 'split personality' in trying to bridge the gap between a person-centred research approach and an (at times) alienating, impersonal organisational culture. This also served to remind me of my early project experiences, of the fact that each of the participants in the IT Skills Project had their own vested interests.

The final reports to sponsors contained observations concerning work practices and made recommendations for action as appropriate. The experiences which led to making these value judgements added to my personal 'baggage' and, ultimately, provided the vehicle for completing the PhD. Yet the process of writing the reports was a painful one, too. It highlighted my need to compromise. I felt that what I wanted to produce would not have been acceptable; that is, I felt I had to present the information in a 'quantitative' framework. In essence, what the sponsors wanted was something that was tangible and measurable. I felt an uneasiness concerning the question of how you measured someone's experiences. It seemed disrespectful and offensive to do so. My approach was concerned with the thoughts and experiences of individuals (as interpreted through my own), but I had to present my ideas in a way which would not only be acceptable to the organisations, but potentially beneficial, too.

So I made the compromises. In holding on to both my personal beliefs and the need to satisfy the sponsors, I had to accentuate one or the other according to the audience. On the other hand, I saw the PhD thesis as an opportunity to present a more holistic picture: to show both sides of the story. It is important to note that I felt it necessary to produce a section on the process of writing this thesis and that this focussed on the problemsinherent in 'plaiting' together different textural components (see Thoughts of Writing Up). On reflection, it seems that the qualitative-quantitative dilemma was also part of the different textures.

I discussed the subject of compromise with a philosophy lecturer at City University. It raised an unexpected but fundamental point: to what extent could I claim to have compromised my approach when my philosophical stance was pluralist i.e. accepted the validity of many different constructions? It was suggested, therefore, that my approach was rejecting what it purported to accept: notably the positivistic trait of quantification.

My response was best illustrated through the journey metaphor. I recognised that different paths could lead to the same destination. I had followed a route through a PhD. I felt that I had made compromises along the way, and I believed it was important to record these as part of my experience. It did not mean that, by so doing, I had invalidated or denied that other travellers were making their own way by means of other routes (see Recommendations for Further Research). I did not present my methodology

as a dogma or a 'correct' method. I presented it as an 'alternative' which could provide a different perspective, enriching the knowledge pool that already existed. In accepting the pluralist stance, I nevertheless, had to observe consistency in my own research framework; hence, the need to highlight any positivist tendencies, and so forth.

A significant point arose from my recognition of the act of compromise in my research. When I came to analyse the information collected during my work within Sponsor B, I decided I had short-changed Sponsor A.

In my willingness to present the latter with something acceptably business-like, I had omitted detail on my methodological and analytical technique. I had assumed that the readership would not be interested or empathetic. This realisation came to me because Sponsor B were so much more concerned than Sponsor A to know what was behind my research work. They wanted to know how I made sense of what I was experiencing.

There may be several reasons for their interest. It may be something to do with my behaviour, or with their academic backgrounds, or simply a heightened sense of curiosity as a result of all the dramatic changes which were taking place within their organisation.

The important lesson for me was this: I had made the decision to withhold information about the research from the staff in Sponsor A and I had done it without consulting them. My decision was hardly a collaborative one. In contrast, my behaviour in Sponsor B was more collaborative. I discussed the background to the research project more with them and also involved at least one of them in the process of developing my analytical technique.

In both organisations, I made a presentation to staff on the issues which would be included in the management reports. I used this as a final opportunity for feedback. The nature of thepresentation differed in each case, though. For Sponsor A the content was more dry and business-like. This reflected my beliefs about what would be considered 'acceptable'. For Sponsor B, however, the mode of presentation was more exciting and unusual (see Appendix 13). I used the theatrical metaphor in order to present the information. I was encouraged to do this by the interest of the staff and was aware that they would only attend the presentation if it was put in a way which captured their

imagination. This was partly indicative of cultural differences. The group in Sponsor A was compelled to attend by their management, whereas in Sponsor B it was left much more to individual choice. At least that is my interpretation.

THE REAL DILEMMA

The qualitative-quantitative dilemma was always apparent to me throughout the two case studies. What was less apparent was the extent to which I had taken on quantitative criteria of legitimation in presenting my own work.

Is it advisable or even possible to separate out our cognitive and experiential baggage from that about which we are trying to make sense? I posed this question at the start of the thesis and it still begged an answer.

I believed the answer was 'no'. However, I had under-estimated the scope of 'cognitive and experiential baggage'. In becoming part of the two organisations, in living with the people in their workplace context from day to day, I had taken on some of their baggage, too. Maybe it didn't sit well with mine? Maybe it was baggage I had once rejected. But there it was, and in presenting my story I had failed to take account of it.

It would be dishonest to pretend it had never existed and to rip it from its context (this thesis) so I have left it in for all to see. This represents a learning curve in the Journey Through Post-Processual Research.

It is often only after the journey is complete that the traveller can reflect on the significance of what has been experienced. It seems to me now that all the journeys which I was making and which I was attempting to plait into a thesis combined to form the one which had been thrown into sharp relief by betrayal of the subjectivist philosophy. It was the Journey Towards Holism.

In trying to plait together the empirical texture of the organisational research with the theoretical texture of post-positivism I had often neglected the most important thread of all: the phenomenon of 'self'. I had so studiously avoided weaving it into the reports

to the sponsors and had so detached myself from the research that it was almost too much of an effort to make the re-connection.

Once, I had been afraid to let go and allow the thesis to flow. Then, I was afraid to present it without some positivist props. Finally, I had to redress the balance and to weave in the 'me' that stood behind it all. I had focussed on the signal and the signal system but had neglected the signification process.

I knew I would have to establish a firm grasp of the different threads of the research but now I had to get a grip on my 'self'; and that was the biggest challenge.

THE QUALITY GAP OR IT'S ALL A MYSTERY TO ME

> *"Once upon a time a TQM guru from the Western World ('Mr. X') went to Japan to talk to the head of a very large and competitive organisation ('Mr. E').*
>
> *During his stay, Mr. X asked Mr. E if he would be prepared to share with the West Japan's TQM recipe for success.*
>
> *To Mr. X's surprise, Mr. E said he would be more than happy to do this. After all, he added, he was confident that the West would not be able to put it into practice, anyway!*
>
> *The End."*
>
> *(Based on Deming, see Hodgson, 1987.)*

There is a gap between the theory and the practice of this thesis. It constitutes the separation of myself from the research. Like Mr. X, I had a recipe but I did not put it into practice. At least, not completely. In standing back from the research and compromising my approach for the sake of the positivists, I had disengaged myself from its philosophical foundations and quality had slipped through the intervening gap.

I had unwhittingly acted out my own message of condemnation. Do as I say, not as I do. Like the Delphi Study participants who commented on TQM, I had been aware of what was needed but had failed to make the leap from thought to action.

I believe I was nearer to finding quality in myself when I was working within Sponsor B. This is because I had more courage in presenting my offering. I was not so separatist (separating myself from my research). The route to sense-making i.e. the theatrical metaphor WAS the method of presenting my interpretations to staff. I was not as covert as with Sponsor A. Once I had gained approval here, it was not so difficult to project it into the report for senior management.

But I still hadn't involved them in the analysis process.

With Sponsor A I had been afraid. I had been afraid of rejection. It was one thing to fear unacceptance of one's research findings, it was quite another to be rejected as 'a weirdo'.

Maybe I sensed a bit of what a manager I interviewed had said about technical specialists in the early days. 'Long-haired weirdos', he had called them. No pink shirts either, according to Lawrence's study (1987). Too feminine a shade of red?

I didn't want to be labelled a weirdo. I felt it would compromise my integrity in their eyes. So instead I compromised my research approach and, in so doing, compromised myself. Which was the greater sorrow?

If I had stuck to my guns I MAY have been labelled a weirdo and my methods MAY have been taken less seriously. On the other hand, in whatever way I had presented my findings, the end product would have been the same: i.e. my interpretations. These took a form so 'like' the pragmatic stuff they were used to dealing with that the method may have become irrelevant.

If they had then rejected my offering, it would have been their decision. But by compromising the research from the very beginning, I had already set myself a difficult course. If I didn't have faith in my own approach, how could I expect them to have any!

DE-CODIFYING THE QUALITY LITERATURE

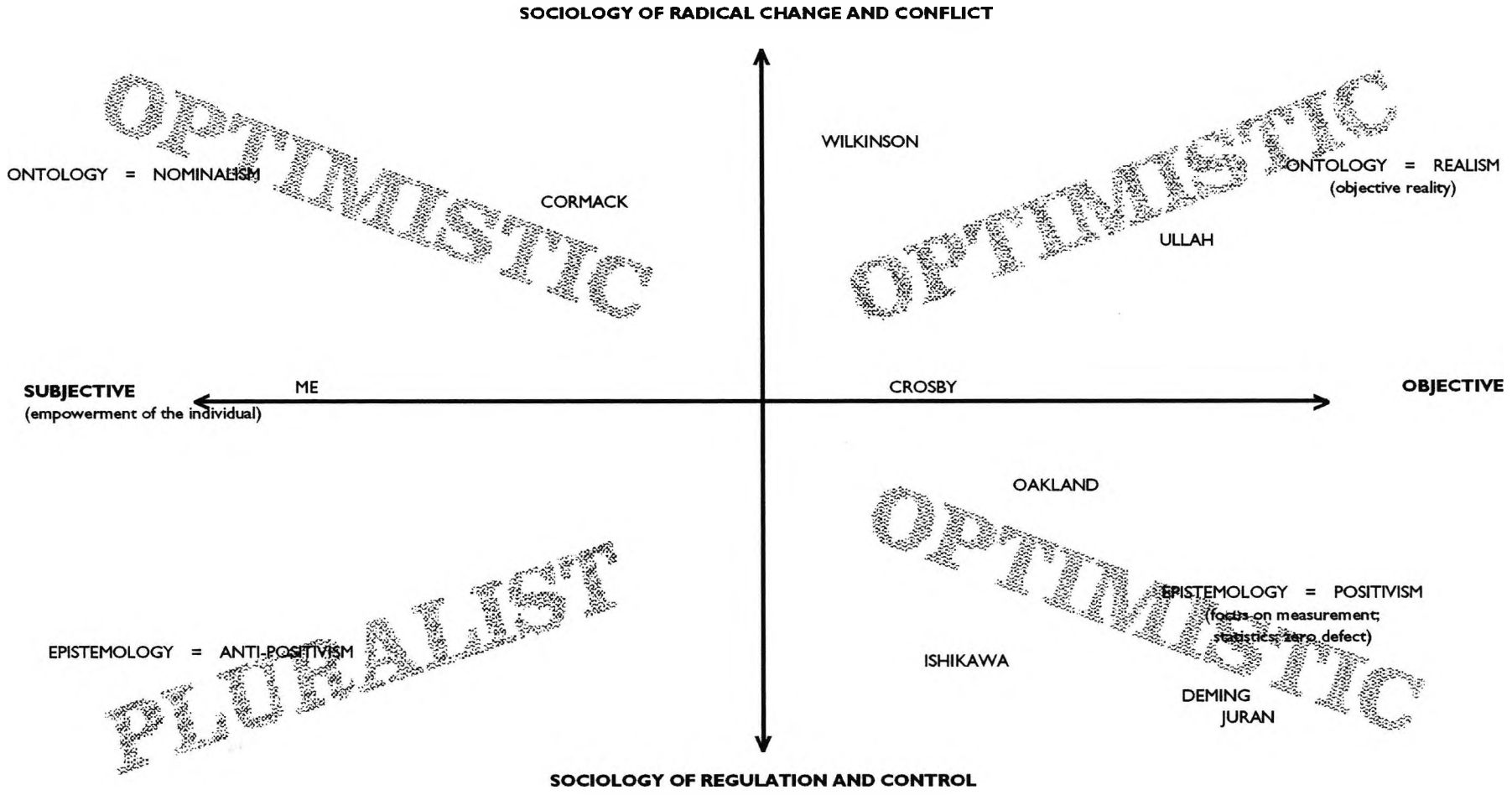
INTRODUCTION

At this stage of the thesis it is apparent that issues surrounding the implementation of Total Quality Management constitute a recurring theme in the Findings. From the standpoint of my personal philosophical beliefs I identified a number of ways in which I believed the accepted tradition of TQM was found wanting. The main reason for this was its emphasis on scientific management which, by definition, focussed on objective as opposed to subjective criteria. This section will 'decode' the views of some of the most prominent writers on quality, in addition to one or two less well-known names.

In Figure 40 I make a modified use of Figure 3 in order to illustrate the main philosophical positions which I have decoded. The two main axes used are subjectivity versus objectivity, and the sociology of radical change and conflict versus that of regulation and control. (The reader should refer back to Figure 3 for a detailed discussion of these criteria.) Figure 40 is based mainly on Burrell and Morgan (1989) and Wood-Harper (1985). The views of 8 writers are represented in addition to my own.

It is immediately apparent that there is a distinct bias (in my opinion) towards the objective and realist end of the philosophical spectrum. I will be justifying my reasons for this but it is, at least, unsurprising given the origins of the quality management ethos. I refer, of course, to the engineering discipline, the manufacturing sector of industry and, more specifically, the production line process itself. The terms 'Quality Control' and 'Quality Assurance' have their roots there. The very terminology itself is evidence of this. Yet it is a perfectly logical situation. What could lend itself more readily to a quantifiable, controllable process of quality measurement than the production process? Whether or not a production process is fully automated, it suggests a series of discrete units of activity. A nice Tayloristic slotting together of jobs. Easily monitored, counted, rectified and accounted for.

The engineering model of organisation is mechanistic. The processes and sub-proc-



Note: optimistic/pessimistic/pluralist relates to views on effect of technology for humans - for example, see Hirschheim and Klein, 1989. Figure based mainly on Burrell and Morgan, 1989.

FIGURE 40: DE-CODIFYING THE LITERATURE
(c.f. Figure 3)

esses that make up the production line are mechanistic. A mechanistic world-view gives rise to a mechanistic mode of analysis and implementation. It is not the people that are the focus here, it is the processes, the mechanisms. Have we not moved away from such sterile conceptions of organisation, though? Do we not pay attention to the organisation and adopt a more organic world-view? Recognition of the importance of 'soft' issues in business (like human resource management) is parallelled by a softening of philosophies. Even systems theory has its 'softly, softly' versions now. Where has this left approaches to quality management?

Developments in thought as seen through the quality management literature would suggest that attempts to soften-up have occurred there, too. The question is, to what extent has this taken place and how does it align with developments in the organisational literature that present a vision of future organisations as fluid, people-centred and dynamic? My answer is, not enough and not very well!

THE WRITERS

I am going to adopt a right-to-left route through this diagram, beginning with the most positivist of approaches (Juran) and working my way towards what I see as the most spiritual (Cormack), saving my own for expansion in the following section.

As a post-structuralist (see Stage Two of the theory journey) I recognise the importance of language in the construction of meaning. My analysis of Juran (Juran and Gryna, 1970) could be summed up with a simple word list culled from his writings: an 'accurate' picture of his thought processes! The following list serves to illustrate his positivism and the engineering origins of the 'quality' concept:

CONTROL • ECONOMICS • STATISTICS • SYSTEM • RELIABILITY • TESTS
SPECIFICATIONS • TOLERANCES • INSPECTION • MEASUREMENT • SAMPLING
PROCESS • AUTOMATION • ACCEPTANCE • MANUALS • DIAGNOSIS • FUNCTION

Fortunately, Juran uses the story of 'primitive man' to illustrate his concept of quality. I

say fortunate because I was trained in palaeolithic archaeology. This gives me a good foothold from which to assess his argument. I shall pass over the sexist connotations of his language use for the moment and instead concentrate on one very important point: the separation of the toolmaker from the end-use of the tool. It is a source of infinite irony to me that Juran uses this concept of separation over time to underpin his argument.

Juran defines quality in terms of fitness for purpose. He says that in ages past the toolmaker and the tooluser were one and the same. Hence, the toolmaker was easily able to judge what would serve the purpose and what would not. As history unfolded, he says, life became very much more complicated and the division of labour such that the toolmaker might not be involved in the toolmaking process at all. How, then, could fitness for purpose be assured? His answer is, through the introduction of objectified specifications.

This is how the quality function came into being. It fulfilled the function of applying specifications. It is also important to note Juran's reference to Taylorism in the USA as leading to the quality function separating out the planning from the execution stages. So, not only do we have a separation at the macro level of needing quality, but also at the micro level of applying it in the workplace.

Before I expand on the theme of separation, I want to make a point of archaeological interpretation. Juran's thesis is based on the notion that in the beginning the man was the toolmaker and the tooluser, too. Quite apart from there being no evidence to suggest that tools were made exclusively by men, there are long recognised cases suggesting that functional separation of tool manufacture and tool use may have occurred way back into the palaeolithic; practically as early as we have 'clear' evidence for tool production at all (see especially work by Binford).

What is the bearing of this upon the realm of quality management? Homing in now on the theme of separation, it is this - the role of aesthetics. Juran's discussion illustrates the separating out of aesthetic considerations from the production process and their replacement with a set of objectified measures (or, specifications). On this level, I agree

with him! Since palaeolithic times we may very well have lost touch with the aesthetic aspects of quality management.

A point which Juran does not tackle is that palaeolithic tools were often curated because of their aesthetic qualities rather than simply their fitness for use! It was also these aesthetic qualities which gave rise to certain tools apparently acquiring economic status. The value of a tool was not expressed only in terms of its ability to do a job, it could also reside in its ability to please the senses - the colour, the shape, how it felt, what material it was made from, and so on. What happened to these qualities over the millenia? They were rationalised out, engineered out, dis-counted.

What am I arguing for here? I am not suggesting that 'quality' in a tool is dependent upon every end-user being part of the production process. That would be absurd and impossible in today's society. But then, I have already argued that such a situation may NEVER have existed anyway. No, the argument is more subtle. It is that separating the human quality from the quality of the product is non-productive. I believe aesthetics are seen as one of those 'soft' areas because they are central to the very core of what makes us 'human'. I do not want to sound like an Epicurean but I do want to emphasise how much is lost when we put up barriers between the individual and the work process. I am coming back to the importance of engagement. As it was with information, so it is with quality. Interaction, social mediation, call it what you will. It is the relationship between the construct and the constructor that should be the focus of attention.

What would Juran have to say about this? I believe his answer is clear. He sees the social aspect of organisations as a PROBLEM. He mentions the importance of recognising cultural differences but only in relation to their contribution to the social 'problem'.

The most promising statement for me is where he says that Quality Control staff must understand that the premises on which they base their proposals are merely products of the culture in which the expert happened to be reared and not necessarily universal truths. The specialist, therefore, needs to see things from the view of the other person and appreciate their cultural beliefs. At a superficial level this would seem to encourage tolerance and understanding of differing viewpoints. However, the concern for Juran

remains how to achieve an objective measure of quality in the face of all this individualism and variability. He takes a rather negative view of what should be an organisation's most valuable asset; its people. They are social beings but it is the social aspects which are the major stumbling block to his quality principles. On the one hand, he claims to respect cultural differences yet on the other he seeks a technique which can by-pass them.

Juran is also a technological determinist who believes that technology has been a major beneficial shaping force in human history, recognising that activities have tended to be arranged around the technology rather than vice versa. This optimistic view of the role of technology can be used to explain his belief in the need to objectify quality by focussing on the processes involved rather than the people:

> *"As the benefits of technology have become widespread, men have organised human affairs around these benefits. An incidental result has been to make society increasingly dependent on the successful performance of the quality function."*
>
> *(Juran and Gryna, 1970, p22, my emphasis.)*

This is not incidental, this is deterministic fatalism! He has simply applied the same logic to achieving quality as he has to the spread of technology. The relationship between humans and technology is apparent: the technology is in control, we simply re-arrange ourselves around it. As Pirsig said (1974), it is not the technology per se that is ugly but the relationships involved. We have to take responsibility for those relationships in defining our future. How can we do that if our role is non-participatory? By 'buying-in' to technological determinism he has essentially abdicated such responsibility.

Having driven home a theoretical wedge and made us the recipients of the technology rather than the shapers, the rest of Juran's argument follows easily. We have no dialectical relationship with the technology. We are separate from it. This gives rise to a quality gap. How do we fill this gap? By creating an intermediary: mediating between us and the technology in order to re-establish the quality link which was severed. Hence, we become dependent upon it for assurance that quality is being maintained.

Like Juran, Deming makes some positive concessions to the nature of people at work

but they do not sit comfortably within the positivist framework (Hodgson, 1987, Deming, 1982, City University, 1991). Deming's approach is based on the principle of cause and effect. He uses the analysis of causes as the prime means of identifying reasons for the lack of quality and he produces different classifications of these. This deductive approach is an important part of his aim to be scientific. He augments it with quantitative techniques, and, like Juran, promotes the use of statistical methods.

He applies the systemic metaphor and argues that the organisation must be stable. If the system is unstable it cannot be measured and if it cannot be measured it cannot be controlled. The importance of control is expressed through his discussion of the role of management. He, like so many writers on TQM, believes that the commitment of top management to quality principles is an absolute pre-requisite for success. However, he also feels that the authority invested in middle management should enable them to carry forward a quality programme in its entirety.

This puts a lot of pressure on middle management groups. It is a top-down approach which under-estimates the importance of participation and commitment at all levels. Although Deming emphasises that management should be by co-operation rather than conflict but he does not expand on the relationships that are necessary to achieve this. He talks about the need to break down barriers, especially between different departments but he does not discuss the sort of communication needed within an organisation.

Deming exhorts managers not to use work standards that are based on numerical quotas since these can be both de-motivating and unrealistic, becoming quickly out of date. One reason relates to the fact that he does not believe in the 'average' worker. Those falling below the average marker may be encouraged to 'fudge' their work and those above it to be lax. This quantitative concession to individualism does not alter the view of organisations as stable systems, however, and all that this implies. None of the dynamism of day-to-day human interaction comes across in his model. The over-riding focus is still on control, regulation and process.

This focus is echoed by Ishikawa:

"...the process, which is a collection of cause factors, must be controlled to obtain better products and effects."

(Ishikawa, 1987, p63.)

Ishikawa, however, tries to explode the myth that leading from the top is the key to total quality, saying that top-down and bottom-up are needed in tandem. He emphasises the importance of cross-functional management and draws attention to the problem of achieving this within a vertical organisational (and social) structure. So he has points of similarity with my Tree Lifecycle. Or has he?

In discussing the role of cause and effect, Ishikawa illustrates his positivist stance. He follows the Pareto principle of the 'vital few and the trivial many'; he believes it is possible to standardise for two or three of the most important causal factors, to control for them and, thereby, to maintain control over the entire system. This is one of the justifications for his claim that Quality Control can work irrespective of the context provided the same principles are always adhered to, irrespective of social system, history, political back-ground, etc.

He recommends 7 tools of Quality Control which are: Pareto chart, cause and effect (fishbone) diagram, stratification, check sheet, histogram, scatter diagram, and graph and control chart. This is a highly quantitative tool kit and his aim is to objectify quality through the use of statistics (symbolically exemplified by the cover illustration on one of his books). He talks a lot about 'facts' and of their use in preference to 'gut feeling' and yet also sees a role for the subjective senses. Once more, like Deming, we see a concession to the individual which sits precariously upon a quantitative foundation.

The role relates to the way in which quality characteristics are tested and measured. He says that sometimes it is so difficult to know the best way to do this that, in the end, the five senses may be used to make the determination. On the surface this concession seems small and almost apologetic for failing to provide a total assessment guide. Yet there is something much weightier here. It feels like the first hole in the theoretical dam. Cracks are beginning to appear and sooner or later the water will come crashing through! What is the hole? It is a concession to the role of aesthetics. At the most

fundamental level of quality assessment, Ishikawa leaves us with the senses to guide us. Not the charts, not the statistics, not logico-deductive imperatives.

Ishikawa was the first writer I came across in this area who mentioned religion and spirituality in relation to his work principles. This leads him to make two important points. The first is that he believes humans are by nature good rather than evil. There are implicit assumptions here concerning the willingness of individuals to respond to their employer's requests. The second concerns voluntarism: there can be no coercion from above, only influences in both directions.

He discusses respect for humanity through full participatory management and the ability to talk to eachother freely and frankly (the "spirit" of Total Quality Control). Considering the situation in the USA, he concludes that problems arise because managers lack concern for social responsibility and the welfare of employees: "Society suffers from their unconcern." Nevertheless, he also says that "irrational behaviour" in industry and society can be corrected. This emphasises his realism and his over-powering realism drowns out any message of spiritualism which may have come from his thesis.

Ishikawa takes a broad-brush approach in line with the scientific aim of generalisation. There is no discussion of the role of values and of individuals in detail. Although he sees the failure of Taylorism and the zero defect movement in the USA as a consequence of ignoring employee 'humanity', he also blames it on the lack of scientific tools. Hence, his focus remains squarely on the objective processes of Quality Control and not the subjective perceptions of individuals.

This is also true of Oakland (1989). However, Oakland's argument has more of an individualistic twist because he states that the focus of control must shift from outside to inside the individual employee. He even speaks of the empowerment of people to act and of teamwork, although there is no real discussion of this. His approach owes much to his belief (like Ishikawa) that humans are good by nature. The proof of this in the work context is that all people are ambitious and want to succeed and, therefore, do not need to be coerced.

This is a generalisation, of course, and I would claim to know at least two or three people

who are openly career un-ambitious and proud of it! This aside, the implication of his argument is that since people are inherently good and willing to co-operate at work, the focus for attention should be the processes and tools involved in implementing quality management rather than the staff *per se.* Subscribing to the unitarist philosophy, by definition, militates against a treatment of individualism. We, thus, remain in the same arena as the other three writers: that of control and process.

I have already mentioned elsewhere that I agree with Oakland when he says that the biggest challenge a company has to face is the change needed in the professional staff themselves. This confirms his point about internal rather than external control for the individual. Part of encouraging internal control in staff, he says, is access to training. If people's willingness is not in question, then one focus becomes the skills required to act. If you give people new skills you will give them a new attitude, thus, training provides the impetus for this change. Oakland is not the only one to emphasise the importance of acquiring new skills in relation to quality management but it suggests a dubious role for training.

Both Sponsor A and Sponsor B invested heavily in training yet this did not prevent the apparent failure of their quality programmes. Training in itself does not change anything, especially not individual attitudes. People are not necessarily easy to brainwash and training is not (should not be) a brainwashing activity. The role of training should be a support role: to provide the resources needed to release individual potential. Oakland's negative connotations are also echoed in his overall view of TQM as a "method of removing waste". In other words, he adopts more of the original auditing approach than one which emphasises innovation, creativity and positive potential.

Oakland paints a cut-and-dried picture; as is often the case with quantitative approaches. His recipe for success includes, as usual, management commitment and process control tools (statistics, charts, diagrams). Indeed communication itself is via charts, diagrams, etc. and, despite his claim that teamwork is an essential component of TQM, there is virtually no discussion of human relationships. For example, he urges managers to encourage trust and the free exchange of ideas and information but he fails to address

the problems this philosophy creates within the context of a technique that demands total control.

Oakland promotes a thoroughly systematic approach to TQM. He sees consistency as the key to quality since it leads to total control, and the application of quantitative tools as determining the extent to which consistency is being achieved. His faith in consistency does not prevent him from ommitting to address the 'ifs' of quality.

He says that IF there is a good understanding of quality, and IF there is management commitment, and IF there is a written policy, and IF there is a satisfactory organisational structure, then the planning stages for introducing quality can begin. This seems to me to be putting the cart before the horse. The IF issues are the TQM issues!

Although he claims not to subscribe to the notion that checking, testing and measuring at the end of the process will result in quality, all he really does is to turn this on its head and urge that the control factor be applied at the beginning of the process. As he says:

> *"This concentrates all the attention on the front end of any process - the inputs - and changes the emphasis to making sure the inputs are capable of meeting the requirements of the process. This is a managerial responsibility."*
>
> *(Oakland, 1989, pp6-7.)*

This concentration on the front end of the process is exactly what formal software methodologies do. As was seen in the previous sections such methods can still fail to achieve the quality ideal. Formal methods serve to separate subject from object and subject from subject, resulting in a quality gap.

Figure 40 shows that Crosby's ideas (1979, 1986, 1988) straddle the control/change boundary so it is perhaps unsurprising to find a number of potential contradictions.

Crosby distinguishes between quality and quality control/assurance. The latter, he says, are technical disciplines for supporting quality. Quality itself, on the other hand, is made up of people, their relationships and their attitudes. This definition promises a much more people-oriented view of quality than the writers covered so far. In a number of

ways that is what you get, but it is still rooted in the scientific paradigm despite his statement that "leadership is not scientific".

Crosby is another unitarist, believing that all people are basically good. People want to be proud of everything yet he admits "who knows what makes them proud?". It is as if he has a good theory but knows that the idiosyncracy of human nature will prevent its being applied.

He conveys a curious empathy with the unpredictability of individuals that is in direct conflict with his quality strategy. For instance, quality is tangible and 'precisely measurable' in terms of 'cold hard cash' (a materialistic view). On the other hand, quality is made up of people whose views on something will differ according to their personal attitudes, not to mention that money is a concept rather than a reality (a subjective view)! He makes no attempt to reconcile these contradictions or to discuss how these are to be negotiated within the organisation in order to find common ground. He does tell us, though, that consensus management was never his idea of running a company!

Crosby blames management style for many of the problems that occur when introducing TQM rather than the quantitative tools of its application. He also says most of the problems reside in the process. Is he suggesting, then, that management style is the same as process? If so, then this view contradicts what often happens in practice which is that the tools and methods actually become the process for achieving quality. He fails to make the vital link between management style and selection of tools. The two are not separable and need to be in harmony. Thus, whilst criticising management styles which do not give credence to individuality, he still promotes the use of objectified measures of quality. As he says, objective evidence is vital in order to convince anyone of anything.

The organisation is in a continuous state of flux, which is neither good nor bad (i.e. it depends on the context). People, too, are in a state of constant change (except, of course, that they are all inherently good). At this point we see a distinction from the other writers. He ascribes characteristics of change to individuals and to organisations. Does this mean they are also difficult to predict?

No. In fact, Crosby is so sure of this that he makes two substantial claims:

- measurement can define the entitlements and expectations of human existence

- expense account predictions can be made for the month ahead and be absolutely correct

This is pure determinism. But its impact is softened by yet another contradictory statement that there is no proven way of knowing what customers are thinking about or needing. No wonder he said leadership was unscientific!

Having said that quality is not about subjectivity and that uncertainty must be ruled out, he goes on to discuss spiritualism. Conversion is in the soul, he claims. Organisations are people in the same way that people are churches. Prayer is important to the life of an organisation. How does this fit with all the objectivity needed to achieve quality?

Possibly my favourite point from Crosby is that the purpose of an organisation is to help people have lives. I believe this holds up whether you see it in terms of the employees or the external customers, suppliers, and so on. This belief puts people at the heart of the matter for Crosby. Unfortunately, his concentration on precision and objectivity takes much of the individualism and humanity out.

Ullah (1991) is writing from the perspective of a psychologist. This automatically puts people centre stage along with a consideration of behaviour and attitudes. One fundamental point which he makes is that there is a weak relationship between attitudes and behaviour. Immediately we get a sense that Ullah allows much more freedom of being than the other authors. In the work situation different people will have different responses to jobs. This creates a significant problem for the implementation of TQM when it is assumed that everyone will relate to it in the same way. This was evident from the findings at Sponsors A and B where TQM was introduced in a blanket fashion employing mass communication techniques.

Ullah stresses the need to understand the personalities of individuals in order to assess the likely success of TQM. He, therefore, promotes individualised communication methods and constant feedback. His discussion of feedback, in particular, suggests that he views the organisation and the relationships involved as an evolving, changing entity, and that different players in the organisation will have different agendas.

He is also the first person so far to openly recommend the setting of organisational goals participatively rather than from above. Thus, he moves closer to the notion that everyone has to take responsibility for quality rather than just the management. This strategy also encourages staff to see the results of their own activities. This is an important point because it implies that individuals are being brought closer to their work. Engagement is taking place and the quality of relationships is being improved.

Ullah is another writer who sees training for new skills as a component of TQM but specifically relates this to enabling the person to do their job according to new quality standards. It is, therefore, more a plea to release potential than to change attitudes.

His perspective on motivation is more subjective than Juran's model (which was based on Maslow's hierarchy of needs). In order to motivate someone, he argues, it is necessary to consider three things: beliefs, expectations and values. If we believe our efforts will result in success, and if we expect this behaviour to have an outcome that we value, then we will be motivated to carry it through. Does all this mean that Ullah is adopting a subjectivist philosophy? Well, no. He is a traditional psychologist in that he believes the variability between individuals can be accurately measured with personality tests and questionnaires. So, although he sees people as being at least as important as the company's products, he also believes quality control measurement can be applied to them.

He identifies the main reason for TQM failure with the absence of accurate personality tests. Attempts to measure individual attitudes have, he says, been largely unsatisfactory and unscientific. Just as Oakland recognised consistency as the key factor in determining product quality, so Ullah sees it as the key to selecting appropriate tried-and-tested personality instruments. One danger I foresee here is that managers will be

tempted to recruit only the sort of personalities that fit the TQM bill; those who are most responsive to change. This would seem to contradict much of psychology's established theory that suggests the best teams are those consisting of a wide range of personalities (e.g. the Belbin theory)?

Ullah is undoubtedly a realist. His understanding of human nature leads him to view the world as extremely complex and perhaps difficult to predict but nonetheless accurately measurable. It simply requires complex tools to measure complex psychological variables:

> *"By objectively measuring these we can do much more than simply point to our hunches. We can predict and explain."*
>
> *(Ullah, 1991, p80, author's emphasis)*

Integral to Wilkinson's discussion (1990, 1991) is the recognition that there is a schism between the management approach of TQM and current approaches to the management of staff. This leads him to adopt a fairly pessimistic position on the successful adoption of TQM in the UK.

A management gap exists between the philosophy of TQM as emphasising self-control, and work designs rooted in Tayloristic/Fordist principles. Wilkinson homes in on the point that this is a clash between 'hard' and 'soft' issues; as intimated in my Introduction above. The hard issues are the tools and techniques of implementation (statistics, charts, etc.). The soft issues are concerned more with attitudes, customer relationships, and cultural matters.

As he observes, there is very little discussion in the literature of what atmosphere is necessary in order for TQM to work. There is no debate concerning the chasm between a company's self-awareness of the need for quality and the translation of this into new attitudes. This, together with the unchallenged unitarist assumption prevalent in the quality literature, gives the impression that implementation is relatively unproblematic. Implementation is assumed to be dependent upon motivation and this can be assured by providing training to encourage the necessary attitudes.

By highlighting that TQM is not a quick fix business solution, Wilkinson infers that TQM is not a methodology at all but an attitude. This is borne out by the case studies which demonstrate that implementation is a continuous process rather than one targetted to a particular time scale; such as three or five years.

He picks up on a number of the problems which I identified in my field work. For example:

- initial success of quality circles/action teams followed by de-motivation when their impact is minimal and/or when management are not closely involved

- conflict between inflexible hierarchical structures and the need for fully participative modes of communication

- possibility that middle management will view TQM as a threat; notions of 'flatter' structures

His comments on the role of Personnel are interesting. Whilst TQM is seen as a people issue, the Personnel function generally has a low status within the organisation. Thus, whilst it is important that they play a major part in the quality programme, to hand over entire responsibility would be to relegate TQM's significance. Here Wilkinson agrees with the other writers - TQM must be visibly promoted by line management rather than by the Personnel function.

He raises a number of questions concerning the likely success of TQM which he believes will only be addressable following further research. They are:

a) does TQM offer tangible benefits to employees or does is simply make their work more intense through increased commitment?

b) does TQM raise staff expectations which cannot be met?

c) does TQM threaten to undermine the trade unions?

d) does the unitarist philosophy remove the right of employees to some sort of extrinsic reward for the achievement of quality?

e) do re-organisation and cost-cutting exercises threaten progress and undermine commitment to TQM?

My answer to his questions, based on my field work, are: a) yes because there is too much concentration on the tools and techniques (especially documentation); b) yes; d) depends on the goodwill and honesty of the management; e) definitely! I cannot answer c) because I had no experience of trade unions in my two companies. However, my personal belief is that the nature of the relationship between management and the trade unions is probably the best 'measure' of quality management available! Good communication, good rapport and participation are surely the hallmarks of a happy relationship here?

Wilkinson's perspective is influenced by marxist theory. This is apparent from the focus of his concerns and the language which he employs. There are two assertions which I wish to make in this regard. One is that he has a materialist philosophy and the other is that he adopts a pessimistic view of the management-worker relationship. He says there is a need to be realistic not optimistic. The latter point probably explains why he is one of the very few writers on TQM to have questionned the notion of unitarism.

I believe his materialism is not so much evident by what he discusses as by what he does not discuss. He questions managerial motives for the introduction of TQM and some of the ethical concerns of the worker. He touches on the importance of the values and behaviour of employees; but then so did the other writers. However, he does not say much about feelings and emotions. Overall his reservations have more to do with issues of TQM implementation than TQM itself. Consequently, although he succeeds in outlining some crucial barriers to the introduction of TQM he does not actually question the thinking behind the concept. Perhaps his materialist philosophy is sufficiently in line with the quantitative methods usually applied to TQM not to require a deeper treatment. Nevertheless, I believe the contradictions he identifies at the surface level of management-labour relations indicate a dis-chord at a deeper philosophical and cultural level.

My analysis of Cormack is based mainly on the publication of his Annual Lecture which he gave to the British Institute of Management in 1991. Reporting on the lecture in their July edition of Management News, BIM chose the headline "Rediscover the power of values" and opened the summary with:

> *"Values and beliefs need to be back on the corporate agenda if excellence at work is to be achieved."*

This illustrates Cormack's departure from the traditional TQM party line. His concern is primarily with the feelings that people have at work as individuals rather than prescriptive methods of implementation. Excellence is a value not a skill. It occurred to me that this could be one of the reasons why my own research had begun as a search for skills (at the request of the organisations) but had developed into comments on quality management. So, my research could be seen as an illustration of just this point!

He recognises that training for TQM has been poorly focussed, concentrating on the 'what' rather than the 'why'. This accords with my own observations of formal methods and project management techniques at Sponsors A and B. His comment that continuous improvement should embrace the being as well as the doing is really the same argument that I have made about the need for engagement. Concentrating on the 'what' in training serves to alienate the employee from the work. Training needs to refocus on the 'why' and in this way contribute to the individual's sense of self worth.

He challenges the profit motive early on in his lecture, saying that personal and business values have often been reduced to this to the exclusion of social and spiritual values. He contrasts with other writers not only because he embraces spiritualism, but also because his criteria for assessing quality are inverse to everyone else's: 'how many times have we transgressed ethical boundaries?' rather than 'what do the statistics tell us?'.

We are pursuing a false logic, he argues, in attempting to import management techniques from another country (whether that be Japan or the USA). Instead, he adopts contextualism:

> *"This paper asks that we rediscover our own values, teach them and through them provide a new input to our staff from which excellence might grow."*
>
> *(Cormack, 1991, p5, my emphasis.)*

Discovering our own values is at the heart of the TQM 'problem'. Cormack queries whether British management is even able to articulate its own values and beliefs? The main reason for this is that we have traditionally excluded values from the workplace. In my opinion, of course, this is because we have sought to be scientific and science aims to be objective. The exclusion, therefore, is purely logical! Cormack calls this the exclusion of the "Whys of excellence". Japan, on the other hand, incorporate Shinto and Confucian values into their businesses. He sees this as the main motivator in Japan for acquiring the necessary skills to dominate so much of the world's commercial markets.

However, this is not to suggest that Japan is a perfect role model, and Cormack highlights some of the problems which their religious beliefs have contributed, including a high level of sexual prejudice and youth alienation. Hence, the call to rediscover our own values and not someone else's. We each have our own contribution to make and our own lessons to learn. This appeal to individualism at the national level is reflected at the organisational level, too, and it is here that Cormack's individualism is at its most evident. Each organisation must consider its staff as individuals not as an homogenous workforce requiring standardised training programmes. Excellence at the individual level comes from a sense of "what I am and what I can become as well as what I do". Skills will not produce excellence, this is achieved through values and beliefs which give significance and purpose to the individual.

Cormack identifies some missing values which include the value of personal worth based on the uniqueness and significance of the individual. People are a company's greatest asset because of their unique potential. Excellence should be sought, not because of profit, but because it brings satisfaction and fulfilment. This is a new and deeper perspective on Crosby's belief that a company legitimates its existence by providing people with lives.

Alongside this ethics-based role of the organisation, he re-defines that of the manager, too. Like Deming, he places a lot of responsibility on the shoulders of management except that he makes them custodians of business, staff and society. Yet, he recasts this role into one of a leadership which serves and underlines this with "to manage is a privilege not a perk".

Cormack is a Christian who draws on the principles of his religion and the bible in order to support his arguments. He believes that people have intrinsic value. This is based on his faith in God as Creator and in humans as created in that perfect image. Thus, although he recognises individual uniqueness he sees excellence as our pre-determined destiny. This is a deterministic viewpoint. It is also an optimistic one. It raises questions concerning the role of choice.

Cormack might answer these by saying that although the individual retains freedom of choice it is still within the confines of God's overall plan for humankind. Some would argue that this plan is a constraint on the development of humans. I believe Cormack's answer to this would be that it is actually liberating. Evidence for this is found in his comments on the role of an organisation's mission statement. Like other writers, he emphasises the need for consistency. For him, consistency relates to the upholding of ethical values. In order to ensure this the organisation must draw up a set of corporate guidelines, a business philosophy. As he says,

> *"Such statements are not a set of rules or laws within which people are constrained, but rather enabling and empowering guidelines which emphasise the spirit rather than the letter of the statement."*
>
> *(Cormack, 1991, p9.)*

Like training programmes, they should emphasise the 'whys' rather than the 'whats'. In theory this sounds reasonable. The practice, however, may be different. Both Sponsors A and B had mission statements relating to TQM. Nevertheless, they were still accused of paying lip service. It could be argued that Cormack's thesis encourages management to equate its role with that of Cormack's Creator: directing but benevolent. It also assumes that the intrinsic good of the individual (unitarism) will lead them to operate

within the confines of the mission statement; since this is their 'destiny'. Unfortunately, we know this is not always the case and there have been much-publicised cases of insider dealing, etc. This is one of the very reasons why Cormack's call to ethics is so urgent. Yet he puts insufficient stress on the case that having a set of guidelines does not of itself constitute TQM and does not ensure that people will buy in to them.

One of the basic 'whys' of the mission statement for Cormack is love. He insists that we must love our neighbour, and that means our customers and our bosses, be selfless and serve others. As he points out, mission statements should not be regarded as laws. However, this is beginning to sound like the ten commandments. Cormack recognises that people are constrained by laws. I would add that they are also tempted to break them. Therefore, the emphasis needs to be on participation and consensus. Part of recognising the value of individuals is giving them an active role in the development of the company and that especially includes the goals. Unfortunately, the theme of participation is one which Cormack neglects to address.

It is a long way from Juran's statistics and technological determinism to Cormack's discussion of love and spirituality. In the next section I will illustrate how much farther I believe the discussion needs to go before we are in a position to appreciate what TQM really means for us as individuals.

THE TOTAL OF TQM

INTRODUCTION

I am conscious as I sit down to write this that I must not make the same compromises here that I made when I was conducting my research at Sponsors A and B. In other words, I cannot submit to the Paradigm Yak!

I must say it as I feel it and not how I think the positivists would like it to be. The first point that arises from this is that I will not be presenting a prescriptive list of points on 'How to be successful at TQM'. I know that is what will be expected by many people. It will be expected because that is what we have become accustomed to receiving. But it is what we have become accustomed to that is at the root of many of the problems experienced when implementing TQM in this country. I mean this primarily in two ways:

1. We are accustomed to being given advice free of context.

2. We are accustomed to a generally conservative management culture, encouraged by and reified through the objectives of scientific management.

I will deal with these two points in turn.

THE PROBLEM OF CONTEXT

The fieldwork I conducted suggested that TQM was not being introduced into the organisations as effectively as had been intended. Similarly, it was evident from the literature that this situation was not unusual, e.g. Wilkinson et al (1990). But the continued emphasis by the business world on achieving quality standards in the face

of strong competition (notably from the Japanese) indicated that TQM was perceived as being important to the well-being of our nation. The desire to introduce a quality culture into UK business has given rise to much-publicised changes within our best known companies, often involving large numbers of staff redundancies, including at Sponsors A and B. It has also resulted in a proliferation of quality specialists, both internal and external to organisations. By external specialists, I particularly refer to commercial consultancies. This proliferation is a response to our urgent need. We are as a child in search of guidance. We find ourselves to be in a situation which is new to us and we need help from those who claim to have some insight into what is required. By dint of our business culture, a culture which extols the virtues of science and seeks to emulate its principles in our management techniques, we expect to be given rules and regulations by which to judge and measure ourselves. We expect to be given a solution. We look to the 'experts' to hand us a prescription: a cure for our lack of quality. This is what we have asked for and this is what we have been given. But it has not worked. What would we say if we were handed a prescription which simply read:

"The answer must come from within yourself."

Our reply would probably be along the lines that the experts were dodging their responsibility and were not prepared to commit themselves to a diagnosis. There are similarities here with the approach of the traditional doctor of medicine versus the holistic medic. Some people may see 'alternative' medicine as a passing fad. Some people see TQM as a passing fad. But there are other similarities which have significance at a deeper level and which will be explored further later. For the moment it is a comparison which I draw in order to suggest the neglected aspects of context.

A traditional doctor of medicine is used to making a diagnosis based on a set of accepted generalisations and 'if, then' logical deductions. So that if a patient has such and such symptoms, then it is likely that such and such is the cause of the problem. (Note the connotations of 'patient' as an object of study as opposed to the notion of patient as co-worker, for example, Healy, 1990). Sometimes further investigation is necessary to confirm the doctor's viewpoint. Of course, the question of whether the treatment provided is successful depends upon your point of view. Is it to be measured in the short term or the long term? We tend to measure it in the short term in much

the same way as we have been used to measuring our business success. What if the complaint reoccurs? Does this mean that the treatment has been unsuccessful? The traditional doctor diagnoses a patient based on the set of learned generalisations. They are also usually considering the 'illness' in isolation from other aspects of the patient's life and well-being. It is not often that a doctor will consider a patient's physical, mental, emotional and spiritual states during a consultation! Thus, it is not a holistic approach.

I believe it is no coincidence that there is a renewed interest in our society in 'alternative' or 'holistic' approaches to health and happiness. I believe we are fed up with short term answers. We want longer lasting methods of improving our quality of life. Ironically, one of the biggest contributors to this situation has been increased awareness of stress and its effects, especially stress which appears to be related to work. Just a few minutes walk away from the University lives a music therapist who holds sessions for business executives suffering the effects of stress. These people are trying to improve the quality of their lives. They, like so many of us, demonstrate how personal well-being cannot be parcelled up into 'on duty', 'off duty' moments. We are only just beginning to appreciate this. How we are at work affects how we are outside of it, and vice versa. It is the same with the quality of work as it is with the quality of life. It is a situation which requires holistic consideration. In order to adopt a holistic approach, we need to reclaim our context. This is a fundamental issue for TQM. I am not just saying that contextual issues get ignored, I am also saying that the notion of context itself may be mis-appropriated.

What is the context within which TQM is applied? I would expect most managers to respond to this by focussing on the nature of their business sector, market forces, and so on. This is the familiar territory of the economist, forecaster, and strategist. But, as usual, it is a high-level materialist approach. A holistic approach is needed if the 'Total' of TQM is to be achieved. The lost context is not the workplace itself but the individual and so the 'total' of TQM becomes the totality of the individual. Everyone needs to be considered as a context in their own right, hence the need for a new approach which current TQM approaches only hint at through their references to 'participation'. As someone who has emphasised the importance of contextualism in a methodology, this feature of what I see as the 'failure' of TQM comes as no surprise. It may come as a

surprise to those who are used to a more 'scientific' approach, because they will be used to the notion of generalisation and this does not appear to be compatible with a contextual and individualistic approach. However, you cannot adopt TQM. It is not an orphaned child that you invite into your family. TQM has to come from the people who make up the organisation, so that the organisation is TQM or more specifically, so that the people are TQM. This means that every company will be unique in the way it expresses this (something Deming also emphasised) which puts another slant on the old adage 'people are a company's most valuable asset'.

Having addressed the question of what the context is, there remains the question of how to awaken people to it. Eastern medicine has been practicing a response to this for centuries: a deeper understanding of the self. A popular message is 'only by attending to your own needs and being 'centred' will you be able to attend to the needs of others'. *[I get a tingle here.]* The Japanese are able to integrate their personal and spiritual beliefs and values with the notion of TQM at work. Could this be because they understand themselves better than we understand ourselves? We are not Japanese, that is why we cannot adopt a Japanese TQM philosophy. They learned about TQM from the West but they developed Japanese TQM out of their own context, out of their own beliefs and values. We will have to do so, too (Cormack, 1991) whilst bearing in mind that we are a very cosmopolitan nation. We will have to weave TQM from ourselves, rather than weave ourselves from TQM (as most experts would have us believe), and the pattern will be different for each organisation (see also Foster and Whittle, 1990).

The dangers associated with ignoring the individual as the focal point are exemplified by the fieldwork reported in this thesis. Themes of separation have come to the fore. Within the IT departments of Sponsors A and B formal methods were emphasised as the vehicle for the achievement of quality yet, ironically, this was the very barrier to quality attainment because its effect was to distance the individual from their actions.

Zuboff (1988, p349) quotes one of her field work informants:

> *"'When everybody looks at the data base, it should be obvious - data becomes the focus, not the people. People hear words differently, but with the right data, we have something objective beyond what each person hears.*
>
> *With all of this data, you can be more objective and less subjective. You don't have to debate; you can see what is true.'"*

This view of data is echoed in Harrington's discussion of information as a resource as opposed to a perception (Harrington, 1991). Juran, too, believes that no human being should be required as interpreters or evaluators, seeing transmission between humans as purely in terms of quantifiable units of measure (Juran and Gryna, 1970). As Zuboff points out, this view comes close to Frederick Taylor's dream of mutuality born of a perfect science. Information is presented in a way that claims to eliminate the conflict associated with subjective opinion. The belief is that individuals confronting the same data will find the same 'truth' revealed, and that in this way the system will eliminate disagreement about "what is". In other words, the way the information technology is implemented erradicates ontological ambivalence. It re-constructs your world according to the rules defined by the organisation. But what if we reconsider the nature of work and dialogue with information technology? Suppose we see it as the continual creation and re-creation of meaning. Meaning creation implies emphasis on intellectual and abstract skills. It also implies engagement. In my discussion of the definition of information technology (Two Journeys Intertwined), I said that data becomes information by virtue of social mediation. Someone had to be mediating with the data in order for it to have meaning; engagement was crucial. No engagement, no meaning. I am taking this argument further within the context of this research by extending this statement to: no engagement, no meaning, no quality. It is my belief that Sponsors A and B, by introducing working methods which obstructed employees in their engagement with their work, promoted a typically positivist and separatist idea and, thereby, introduced one of the most significant barriers to the achievement of quality. I will expand this point later.

THE SCIENTIFIC TRAP

Now to tackle the second point - scientific management. Is Quality an art or a science? The easy answer would be to say both but the point is that quality has tended to be presented in the literature as attainable through the application of scientific techniques at the expense of focussing on the 'softer' issues. There is no clear-cut division between art and science, anyway. The immediate need is to recognise that TQM calls for the total person and a combination of total potential abilities. (This comment was made in the report to sponsors and discussed earlier in the thesis.) There is little point in separating out the 'scientific' or 'technical' skills and tools and presenting these as the route to TQM, yet this is what comes across from virtually all the literature. As Cormack (1991) said, excellence is a value not a skill, and values are subjective and are to do with people, with individuals.

In contrast to the way it was implemented in Sponsors A and B, I have argued several times that TQM should emphasise the 'why' rather than the 'what' (see also Hodgson, 1987 and Foster and Whittle, 1990). At a crude level, it could be said that the 'why' corresponds to values and subjectivity, and that the 'what' corresponds to skills and objectivity. Again, I make the observation that this is why my research changed its focus from being a study of IT skills to being a consideration of attitudes and values in the achievement of quality. The sponsors had implemented TQM in a way which had put the cart before the horse. The 'what' was dictating the 'why', the rules were dictating the attitudes, and people were expected to fall into line either through minimal training or learning by example from their senior management. Individuals do not always respond well to this sort of approach. They are not objects which can be re-clothed in new attire or, as the manager at Sponsor B put it, sheep-dipped into a different set of beliefs. In a City University Business School newsletter on Europe, a Professor of Strategic Management in Paris reported that companies run into serious problems when implementing TQM without a strong existing participative management style. Only once participative management is established can 'sophisticated' quality techniques be introduced. If such methods are introduced too quickly they will simply reinforce Tayloristic modes of management. Too slow, and they will destroy motivation. Unfortunately, it often seems simpler to approach change in this way. Management may find it easier

to conceptualise in terms of objects rather than subjects particularly at high levels of decision making. In the work context, we are not accustomed to having to deal with problems at the individual or subjective level according to our specific circumstances. Neither are we accustomed to being told that we must change our perspective completely! We are accustomed to a generally conservative management culture, encouraged by and reified through the objectives of scientific management. Zuboff claimed that the scientific aspirations of management were a significant impediment to development of the workforce and to effective deployment of information technology (Zuboff, 1988, p222). I would extend this point by saying that it is also an impediment to the achievement of quality. I said earlier that we expect to be given rules and regulations by which to judge and measure ourselves. There is the rub. How do you measure totality? How do you measure quality? How do you measure management? Even if it were possible, is it an appropriate strategy? Zuboff warns of the pitfalls (1988, p395):

> *"The quality, rather than the quantity, of effort will be the source from which added value is derived. [Economists] ...measures will be systematically indifferent to what is most valuable in the informated organisation."*

And TQM cannot be legislated for either, despite the impression that standards like BS 5750 (ISO 9000) may give.

Notice how most writers on the subject of TQM feel the need to objectify their notions of it by drawing diagrams and models of what it should be like: this is how TQM looks, these are the steps you should follow. This satisfies a desire to objectify but does not take account of the view that "maps, growing ever more real, are much less true" (Winterson, 1989, below). All TQM "maps" do is test people's ability to follow rules. They do not constitute TQM itself. TQM is whatever you need for your own context - and only the situation itself can generate an appropriate response. Quality has to come from within, it is an emic construct not an etic one (see Journey Through Post-Processual Theory for discussion of etic versus emic). It is, therefore, by definition a subjective rather than an objective enterprise. By way of illustration, suppose that I ask one person "did you have a good time at the party last night?" they may reply "yes". If I ask another person from the same party the same question I may get a "no". Does this mean they went to different parties? No, of course not, it indicates that we each experience things

in different ways. Someone will respond to this example by saying that I have missed the point entirely and that what is required is a TQM prescription that is general enough to apply to everyone. Like quantification, generalisation is one of the prime scientific objectives to which we usually aspire. This is where we return to one of the main stumbling blocks of a scientific approach. As Lincoln and Guba (1985, p110) said:

> *"The trouble with generalisations is that they don't apply to particulars."*

It is clear that Sponsors A and B had adopted TQM according to the 'scientific' principles taught by quality gurus such as Deming and Juran (see Figure 40). The orientation here is 'fitness for purpose', or functionality, as inherited from its manufacturing and engineering roots. The sponsors' understanding of TQM's aims and objectives is well represented by the following message taken from one of their handbooks:

> *"Our primary goal is to serve our customers well in every respect. That means identifying their specific requirements and then meeting them - first time, every time. This is what Total Quality Management is all about."*
>
> *(Taken from a confidential handbook on Total Quality Management within Sponsor B.)*

Within a TQM framework everyone is considered to be a potential customer. Thus, there are customers internal to the organisation as well as external to it. Who are the internal customers? They are the employees. So, let us focus for a moment on the internal customers and see how the message changes:

> *"Our primary goal is to serve our employees well in every respect. That means identifying their specific requirements and then meeting them - first time, every time. This is what Total Quality Management is all about."*

This puts a completely different slant on the statement. This change in perspective, from etic to emic, is important because it is the potential resistance to this approach that I am suggesting is primarily responsible for the failure to achieve full TQM. The extent to which it challenges our traditional thinking is evident by reference to the criteria which we use to set our business priorities. Richard Branson was one of the few people to

invert the 'normal' order of these and, thereby, adopt an emic stance when he said of Virgin (airlines):

> *"Unlike many British companies, our philosophy has always been to put our staff first, customers second and the shareholders third... With a loyal, happy staff, a company can achieve anything... So putting staff first effectively puts customers first also - and, because our customers are happy, then our shareholders benefit and they come first also. This may sound obvious but it often appears that companies set about this in reverse."*
>
> *(Cowe, 1991)*

If we need to adopt an emic perspective and focus on individualism then the appropriateness of the scientific method, with all its emphasis on objectivity, is called into doubt. Unfortunately, this possibility may be more than most managers are willing to consider. I ended a previous section (Purple People) by saying that if organisations viewed quality as crucial to success and were aware of the changes that were required in order to achieve it but were unwilling to make them, then it was possible they did not really want to succeed. For a deeper understanding of why this may have come about, I considered Pirsig again (1974, p289). He talks about the phenomenon of getting 'stuck'. I see this also in Sponsors A and B. They are stuck in their current modes of TQM, in their current mindsets, but the problem is that they do not recognise their own stuckness and so they are unable to move forward. As I have already observed, while I was conducting my fieldwork I became caught up in the positivist mindset and ceased to fully engage with the research, making compromises along the way and letting quality slip through the intervening gap. I believe a similar situation gave rise to the problems encountered by Sponsors A and B with their TQM programmes. Weighed down by the heaviness of the positivist tradition (Paradigm Yak) they were ensnared in the scientific trap. They created divisions between subjects and objects so that Quality, being a thing of wholeness, disappeared in a puff of deductive logic.

Separation leads to the lack of engagement and, ultimately, of quality. Separation can take place not only between subject and object but also between subject and subject but first I shall review the separation between subject and object. Here is a comment on the 'use' of structured methods by an analyst programmer in a commercial organisation not involved in the fieldwork:

> *"Question: What is the purpose of a structured methodology?*
>
> *Answer: To slow down the production of systematically incoherent problems!"*
>
> *(Patterson, 1990.)*

This programmer clearly has no great love of formal methods. There are two points which he makes here. One is that they can have the effect of slowing down the time it takes to complete the job. This comment was common amongst the staff at Sponsors A and B. The other is that the methods, although claiming to make software production more systematic, still do not help to clarify what has gone wrong. It could be argued that this is the result of the lack of engagement. No matter how systematic a process is, if it does not involve engagement then no meaning will result from it. In my earlier Philosophical Reflections it was illustrated how formal methods effectively negate an individual's act of signification. How can quality be achieved if the reader of the text is given no role in its interpretation? The method cannot provide meaning of itself and so the message remains "incoherent".

Social relationships are key to uniting both subjects and objects in the achievement of Quality. The effect of adopting such a perspective on information technology has been expressed as:

> *"When information technology is thought of not as a 'technological fix', but as a [pattern of social relationships], questions about work roles and employment relationships, organisational effectiveness ... and alternative approaches to management and organisation come clearly to the fore."*
>
> *(Blackler and Oborne, 1987, p29.)*

This quote suggests that in shifting the focus of IT to the nature of social relationships the fundamental issues for organisations become apparent. I suggest that this not only applies to IT but also to TQM and that until we do shift our perspective we will not achieve full TQM.

Sponsors A and B had introduced 'quality' methods of work organisation that not only separated subjects from objects but also subjects from subjects. In Sponsor A, for example, I said that LSDM served to highlight a divide between analysts and programmers. The divide at the level of work process served to reify the rivalry which existed between the two groups. There were historical reasons for the rivalry which appeared to have led to differences in career paths. Summarising it crudely, I said that analysts were much more likely to be targetted for management positions. This meant that the programmer group were less likely to be developed to their full potential or to be offered a similar range of career choices. Thus, the introduction of TQM through formal methods mirrored already existing divisions in workforce relations and management attitude. It could be argued that, far from introducing quality, the methods were degrading chances of its achievement.

The following quote further indicates the importance of engagement between subjects and the need for quality relationships. It is taken from a memorandum sent in desperation and anger from a senior analyst programmer to a marketing manager within a commercial organisation, again, not involved in the fieldwork:

> *"I am sure this [a full detailed program] would be more useful than a single photocopied sheet of "typical output" and ten minutes "explanation" in non-technical terms of what the user thinks s/he wants, which is often at variance with what s/he really needs to do the job in hand. Either the Marketing Department learns to specify exactly what they want in unambiguous technical terms or the Technical Department learns to translate MarketSpeak into FORTRAN as happens currently. As language is by nature ambiguous, rich in metaphor and open to extensive interpretation, it is not unknown for misunderstanding to arise between the desired and the understood."*
>
> *(Edge, 1991.)*

In this example, Marketing Department are playing an intermediary role between the users and the Technical Department in much the same way that Finance were doing for Project Y within Sponsor B. As I demonstrated within Project Y, this arrangement effectively drives a wedge between the people who will be using the software and those who are designing it. (The breakdown of communications which resulted in Sponsor B was expressed in Figure 27.) There were also the problems encountered with the centralisation of resources, especially technical teams. Project Y found that their work was impeded and morale was lowered when, due to their priority rating, they failed to attract the necessary help from the technical support group. This was a clear case of values playing a major role. It triggered a downward spiral of missed deadlines and unfulfilled objectives. The worse the situation got, the more likely it was that the project would be scrapped. There was complaints of support staff 'buying out of timescales' and a hankering back to the days when they were all part of the same team; no separation, no divisions. Once again, we return to the principle of no engagement, no quality. If people cannot engage with eachother, especially their 'customers' (internal and external), then TQM will remain an elusive quality.

DESCRIPTION NOT PRESCRIPTION

The fieldwork within the IT departments of Sponsors A and B suggested that the following barriers can arise to the achievement of TQM:

1. Top-down implementation

2. Change by control rather than change by commitment at the individual level

3. Protracted nature of TQM 'campaigns'

4. Low visibility of top management and their commitment to TQM

5. Proliferation and ambiguity of methodologies, both at project management and software development levels

6. Unclear relationships between project management methodologies and programming techniques leading to a fragmented rather than an integrated approach

7. Process-oriented nature of methodologies and emphasis on written rules

8. Inadequate training for TQM

9. Lack of understanding at the individual level of potential long term benefits of TQM

10. Lack of communication between different groups in the organisation and the introduction of 'intermediaries'

The details of these points were discussed earlier in the thesis but I have re-introduced these barriers in order to highlight connections between the empirical work and the need for a different philosophy of TQM. It is often easy to detect the faults in something but not so easy to construct an alternative. Similarly, it is easier to talk about TQM in terms of what it is not rather than what it is. In this respect, it has close affinities with my research beliefs which I discussed in the Journey Through Post-Processual Research: the major connections being contextualism and subjectivity. I have argued that TQM cannot be applied free of context or as a generalisation framed in objective, quantifiable terms. The approach has to grow from the context and not vice versa. I began this section by saying that I would not be presenting a prescription for TQM and, indeed, I have not. However, it is appropriate at this point to present a summary. Since I find it easier to conceptualise TQM with reference to what it is not, I have produced a list of these features first followed by what I believe are fundamental pre-requisites of a TQM philosophy. How these are dealt with at the workplace will, by definition, depend upon the particular case, but the fact that they can be related back to the list of 'barriers' above illustrates situations in which the necessary philosophy is missing.

WHAT A TQM PHILOSOPHY IS NOT

Separatist

Optimistic/Pessimistic

Quantitative

Objective

Process-Led

Generalised

Separatism is evident in almost all the points 1-10 above but it is particularly clear in the use of formal methods and the attendant lack of engagement which these imply for individuals. Optimism and pessimism refer not just to TQM itself but also to attitudes towards IT and the nature of individuals themselves. There has been a lot of debate about whether IT is a good thing and whether individuals are inherently virtuous (see the literature surveys of IT and TQM earlier in the thesis). The debate is fruitless, however, for the reasons already highlighted in my discussion of existing TQM literature; and by Pirsig (1974). Values are not pre-determined, they are created, accepted, modified, rejected by us. We tend towards dualistic categories, frequently labelling things according to criteria of 'good' or 'bad'. Just as we feel the need to classify things we also tend to feel more secure if we can quantify them. These tendencies feed our sense of control. The basic principles of science tell us that these aims can be achieved through objectivity, i.e. by keeping the subject separate from the object. We are separatist in our approach. Therefore, in wishing to control quality in the workplace we concentrate not on the subjects (the individuals) but on the objects (the processes). By focussing on the objective processes we can gain control, measure and monitor. And there is another "advantage" to adopting a 'scientific' approach. Because we have erradicated the subjective elements, it means we can apply our methods at a general level. We can generalise TQM. TQM is for everyone and this is how you do it! That is what traditional wisdom tells us but this is not a TQM philosophy.

WHAT A TQM PHILOSOPHY IS

Engaging

Holistic

Individualistic

Self-aware

Sensitive to contexts

Grounded in subjectivity

People-Led

Context-Dependent

These points have been covered already in this section of the thesis but another word is needed on holism. Holism implies that subject and object are not divided. The point is that in the workplace the subject-object divide should be avoided. One way in which this can be done is to ensure that any so-called 'objective' methods which are introduced are, in fact, grounded in subjective experience. This calls for a greater sense of self-awareness as well as awareness of others and how they are affected by changes in work processes. The challenge for change is considerable. We are so used to the notion that we should keep our private and our work lives separate that increasing our self-awareness within the work context could be the most difficult change for most us. We may worry that we will be more vulnerable. It is as if we are being asked to lower our guard. Work processes have become so de-personalised (particularly in relation to information technology) that we are badly in need of this, though. This is where the commitment of top management is so crucial. It is needed in the sense that there needs to be a supportive environment. TQM business mission statements, including those of Sponsors A and B, contain messages like: 'We respect eachother as professionals'. There is no way that this attitude can be forced upon individuals and so its mode of presentation is incongruous. Nevertheless, its inclusion hints at an underlying realisation: TQM will not work if there is no mutual respect. As Deming pointed out, it also depends upon dignity for the individual. The mission statement would have been more appropriate, for example, if it had read something like:

'The management of this company are committed to providing a

supportive environment and one which enables the individual to realise their full potential'.

This sort of 'leading from the top' would be more effective at creating the atmosphere necessary before any formalised methods were applied. Much of the conflict and tension which arises at work could be due to personal insecurity. Individuals who want to perform well at work are much more likely to be upset if they feel they are being prevented from doing this than someone who does not really care. The earlier quote from the memorandum (Edge, 1991) illustrates the sort of frustration which can occur as a result. If individuals feel secure in themselves and are being developed to their full potential then I believe the problems which have been identified as barriers to achieving full TQM will be minimalised. They also need to be kept well informed. Information depends upon engagement, as does quality. People need to engage with their work and with eachother.

HOLISM AND THE INNER SELF

"...it is easy to be blinded by the bright lights of technological achievement to the extent that the propensity for individual development becomes totally obscured. ...give time and thought to deeper matters to help you to balance your scientific achievements with emotional stability and inner security; the suffering caused by such a neglect could be overwhelming."

(Hope, 1988, p74)

Members of the 'alternative' health and spiritual scene are talking about a radical change in perspective across many nations related to a shift in focus from the material aspects of life to the spiritual. Perhaps this is one reason for the timing of the Natural Law Party coming into being as a political force in the UK? Sensitives (psychics, healers, etc) speak of an increasing level of awareness which is currently giving rise to a lot of fear and insecurity as we feel ourselves casting off our old ways and exploring the new. Change, they tell us, requires faith and courage - primarily faith in ourselves. There are lessons here for us in the work context. The UK is a risk averse nation! If we want to make big changes to our organisations we need to have faith in our ability to do so. Here I return to the analogy between holistic and traditional medicine:

"The answer must come from within yourself."

This belief centres on the importance of both holism and individualism. These key themes are missing from TQM strategies in the UK. The holism of Eastern cultures contrasts to the positivism and, by implication, the separatism of Western cultures (look again at Figure 1 early in the thesis). Whilst we should not expect to adopt TQM prescriptions from other contexts, there are significant philosophical pointers here which could be of help to us. We need holism in the West because we have introduced too many dualistic splits into our lives. With respect to IT, for example, splits of subject versus object, optimistic versus pessimistic, good versus bad. Once again, Pirsig said that subjects and objects are not of themselves good or bad but that we assign such descriptions to them based on our value systems (Pirsig, 1974, p294). I argued the same for information technology at the beginning of this thesis. Our tendency to categorise everything into polar opposites as part of our sense-making process is often done without much thought or at least without consciously recognising our reasons for it. I suggest that we carry this mode of thinking through to the way in which we organise our work processes and this gives rise to separatism and a lack of engagement.

The volcano analogy I presented previously (Figure 35) was characterised by such division and separatism. The Tree Lifecycle, on the other hand (Figure 37), centred on consensus and integration. Like the Tree Lifecycle, Zuboff (1988) also urges inter-disciplinary team work and a shift away from linear, hierarchical structures. She refers to this as the 'concentric organisation' and talks about 'post-hierarchical relationships'. In describing the scenario she, too, identifies the need for a holistic perspective. As she says:

> *"The vision of a concentric organisation is one that seems to rely upon metaphors of wholeness - interdependency, fluidity, and homogeneity each contribute to organisational integration."*
>
> *(Zuboff, 1988, p399.)*

Continuous training and education of the workforce is emphasised as necessary to enable individuals to progress in their post-hierarchical and inter-disciplinary careers. After all, how can we make an effective contribution to the whole if we do not know what it is we are able to contribute? Once again, we return to the notion that in order to help others and maintain a holistic perspective, we must first look to our own needs. It was

in respect of the importance of personal development and training that Renan (1891) made the point:

> *"The mind is the goal as the goal of the plant is the flower; without roots, without leaves, there are no flowers."*

If the individual blossoms, the company blossoms, too. The statement by Richard Branson earlier on demonstrated this belief. In the context of TQM personal growth and development becomes a critical issue, as Deming was well aware (Hodgson, 1987). Whereas Deming puts most of the responsibility on management to learn about themselves, I extend this responsibility to everyone. In the post-hierarchical, integrated organisation of the Tree model (Figure 37) responsibility becomes an individualised and collective concept. Everyone must give attention to their inner self, not just management.

I have said that achieving TQM is partly dependent upon raising awareness of our contexts as well as recognising that the most important context of all is the self. Thus, the Total of TQM becomes the total person. I believe in the importance of holism, in the unification of subject and object, and these are unified in the concept of 'self', for it is the self that creates them. This is where cultures of the Far East have such a great advantage over us; their culture is more geared to focussing on the inner self:

> *"What the undeveloped person seeks is outside; what the advanced person seeks is themself."*
>
> *(Confucianism: Analects 15: 21.)*

As a reading of Cormack's address to the British Institute of Management (Cormack, 1991) will confirm, the philosophy of Christianity is well known to most managers in this country. Whilst this may suggest that we have our own spiritual resources to draw upon in the application of TQM, we also have to re-consider how the Christian philosophy is translated into practice. Perhaps the most apparent conflict between my arguments and those of the Christian creed relate to the concept of 'self' and it is here that I wish to extend beyond the message that Cormack gives us. Christianity, as it is usually taught and practiced in this country, is patriarchal. It also focusses on servitude and self-denial as the path to salvation. Attention is, therefore, diverted away from attending to our own needs, to attending to the needs of others. But these aspects of Christianity are

emphasised only at our own choosing. There are as many complementary messages, too. Indeed, I would argue that Christianity is a holistic set of values and that many of the divisions that have been created out of it are of our own making. We have interpreted the messages to reflect our social structures, and emphasised certain aspects of the religion in line with our own preferences.

Reading Zuboff suggests to me that this is also the case with our organisations. She says that the hierarchical arrangement of subservient staff and controlling management is equated with morality and virtue and that this spiritually validated power structure gives rise to a phenomenon of 'self-doubt' accompanying most employees (Zuboff, 1988, p237-239). This reinforces my earlier point about personal insecurity at work. Individuals become dominated by the personality of the employing organisation to the extent that they submit to the 'corporate faith'. In relation to Information Technology, the danger is that it will be implemented in a way which simply mirrors this power arrangement and which renders the organisation even less flexible or open to culture change and which further detracts from the needs of the individual. I will not repeat my earlier discussions of the dangers of IT re-inforcing the status quo. Instead, I want to highlight links with TQM.

The attitude of 'the company knows best' which subscribes to the Tayloristic and subservient view of the worker (Zuboff, 1988, p239) does not take account of the view espoused by TQM that the organisation is the people (Crosby, 1986, p243). Yet, as my fieldwork demonstrated, even when TQM methods are applied they can mitigate against TQM objectives. The classic example, taken from the fiedwork, is the formal method applied to the software development lifecycle which seeks to erradicate the personal element and replace it with an organisational personality. Here is a direct comparison with Zuboff's scenario of worker domination. What is the solution? It is to adopt a more holistic perspective and to re-claim those areas of our value system which we seem to have suppressed. It is to move from subordination to self-centredness. Even the word itself 'self-centredness' may encourage a negative response because of the connotations assigned to it through our personal socialisation into virtue and morality. But self-centredness need not mean attention to the self at the expense of others or neglect of their interests. On the contrary, it implies that there is a balance to be

redressed, a balance which is enabled by gaining deeper understanding of ourselves and being 'centred'. This process of 'centring' the individual will enable potential to be unlocked (which previously would have remained untapped) and which can be applied to the benefit of others. Understanding our inner self puts us in a better position to understand and help others. Indeed, Christian philosophy says it is a pre-requisite, although we tend not to emphasise this to the same extent as selflessness, for example.

Members of the 'alternative' spiritual movement often refer to the inner self as the Inner Child. This concept can be linked back again to the Christian idea that we must become like children in order to enter the Kingdom of Heaven: 'suffer little children to come unto me'. There are, thus, links between British spiritual tradition and the need for holism and 'centredness'. In terms of TQM, we may be alerted to a greater awareness of Japanese culture, but we should not only be looking to learn from them. Since modern Britain is populated by people with very varied types of spiritual and cultural background, we should start to recognise the valuable resources which this could offer, not only in the practice of management but in other aspects of our lives, too. We will then be able to claim that we are adopting a holistic perspective and engaging with our contexts.

To conclude, I have argued that a number of changes in philosophy are required in order for TQM to have more chance of success. These can now be summarised as shifts in focus from:

- QUANTITATIVE TO QUALITATIVE
- ETIC (objective) TO EMIC (subjective)
- GENERALISATION TO CONTEXTUALISATION
- HIERARCHY TO HOLISM
- SEPARATISM TO ENGAGEMENT
- SUBORDINATION TO CENTREDNESS

The rest of this chapter will include comments on how I perceive my own level of engagement and centredness in relation to the research journey.

THE FINAL JOURNEY

A TRAVELLER'S REFLECTIONS

My role throughout the last three years has varied, including: facilitator, negotiator, teacher, student, advisor, specialist, consultant, outsider, insider, confidant, manager, and employee. I changed my behaviour to suit the context.

Working within the sponsoring organisations could be likened to the role of an anthropologist (my academic roots and cultural bias show through again). When an anthropologist went to live in an alien community they were influenced by the values of the culture which surrounded them. Not just physically, as in rituals and ceremonies, but also mentally, chiefly in the way that they made sense of things.

It would be dishonest to claim that the Journey Through Two Organisations had left me in the same state as when I began. Whilst I was 'living' within the two companies my actions were modified, and now that I have travelled through them I feel changed - enriched. I have a wider and deeper understanding of the relationship between employers and employees. I respect the differences that exist between research methods. My research experiences have helped me to respect the differences that exist between organisational cultures.

The Journeys Through Post-Processual Research and Information Technology represented significant learning curves; particularly the latter. I 'grew' during their course. I had the opportunity to explore a research methodology, as well as to develop my knowledge of IT and to put it into practice through my work as a lecturer. I believed that teaching people with a business background helped me to see how individuals related to IT in the work context, as well as to understand how they approached it in the learning environment. Finally, there was a journey of self-discovery. This is reflected upon in the following sections.

DREAMS OF KNOWLEDGE

"Knowledge is the infinite poured into a finite mould."

(Renan, 1891.)

It was the search for knowledge, the answer to the Ultimate Question of Life, the Universe and Everything that Douglas Adams' fictional computer Deep Thought was built to solve. The computer produced an answer: 42. At that time no one understood its significance. As Deep Thought so sensibly said to its creators, now they knew the answer, all they had to do was formulate the appropriate question.

Perhaps there is a clue here as to why I was attracted to the area of information technology. Right back at the beginning of my journey when I had filled out that UCCA form (see Stage One, Journey Through Post-Processual Research), I had stated that the thread which connected all the different subject combinations was the desire to find out 'what makes people tick?'. For me, this was the Ultimate Question. I think it still is. That is why my work has had such an individualistic focus. Computing, along with the other subjects I listed, offered one of many possible routes to tackling this question. (I believe it is the neglect to address this question that gives rise to so many of the problems which companies experience in resourcing their IT departments, and in running their businesses in general.)

Much of life is a search for knowledge. The human race is keen to know the form and structure of what surrounds them, both tangible and intangible. Also, to understand our own being, where we came from and where we are going, if anywhere. And yet, the more we learn, the less we seem to know.

It is the same principle that gets applied to the British education system. When we start out on our quest for knowledge, we tend to be generalists. We know a little about a lot of things. As we continue along the traditional academic route, we narrow our focus more and more, such that we become specialists -individuals with in-depth knowledge of a particular area. However, with that level of learning comes a greater appreciation for the vastness of the areas with which we have no such familiarity. The farther along the path we are, the more distant seems the goal.

In the past I pondered on the nature of our universe. I, like many others no doubt, tried to imagine what infinity looked like or, if existence was finite, where it ended and where it began! It was one of those Ultimate Questions destined to bring about my frustration, bewilderment and sometimes a headache. I had a sense of my question being totally inappropriate to the knowledge which I sought. Somehow I felt the 'answer' was outside the rational structure of things. My inquiry usually ended with a recognition that I was not yet equipped with the understanding necessary even to formulate the appropriate question. It was not so much a recognition of defeat as a recognition of unreadiness, of deferrment to a time when I would be better prepared.

And then came the dream. I was not prepared for that.

There are sleep-dreams that stay with me in my waking life. Some because they have been recurrent - perhaps, ever since childhood - others because the experience of dreaming them was so powerful. My dream of knowledge falls into the latter category.

> *I was in a sort of black void - a symbol of my struggle to find the boundaries of the universe or to uncover the essence of infinity. It was also a symbol of 'being in the dark', of feeling that I lacked knowledge.*
>
> *I could see only my head. My face was in anxious anticipation, waiting for the moment of completeness to arrive, expecting it to be a triumphant, joyous experience. Fulfillment.*
>
> *Then, quite suddenly, it came. Total knowledge. The answers to all those questions, and more. I knew everything. Everything.*
>
> *But it was not a joyous experience at all. It came like the dawning of some awful realisation that leaves you full of dread. It was overwhelming.*
>
> *And in the very next instant it was gone. The knowledge had gone. I was gone. Everything was gone. Nothing left. That was it. Finished.*
>
> *This was not fulfillment, this was utter emptiness. Existence had ceased. There was no longer any point to it.*
>
> *My world had come to an end.*

As this thesis draws to its end I realise that it is but a finite mould and all the research I have conducted infinite in its potential for interpretation and re-interpretation. However hard I have tried to recapture the research experience, much of it will have flowed over the sides of the mould and back into the depths of my sub-conscious. And each reader will re-mould what is left into the likeness of their own mind-world.

As Smith (in Guba, 1990, pp167-187) said it is not possible to determine whether you have correctly interpreted the interpretations of others. Even if I could be sure that I had asked the right questions, there would be no straight answers, only possibilities.

But, then, without possibility there would be no room for further research.

THE MIRROR OF RESEARCH

I am looking at my research and I do not like all that I see.

Research is about gaining and contributing to knowledge but it is not just about externals. It is also about learning who we are.

So, who am I? Am I an archaeologist or a lecturer in Information Technology? Am I a philosopher or an applied researcher? Do I really need a label? Can't I just be and leave it to others to worry about how I fit into the scheme of things?

When I am talking to my students about research methods, I ask them to pause and reflect on four points. The first of these is that an appreciation of the full range of research methods helps to deepen a researcher's understanding of their own work, irrespective of their own preferred technique. The second is the importance of knowing why we do what we do, and how it influences the outcome of the research itself.

I am now pausing and reflecting on my own application of research and the third point, in particular, reminds me that I have not practiced what I preach. It concerns the need to have the courage of our own convictions but also to be honest about where we have had to compromise - for instance, for political or financial reasons. In the act of doing

the research I betrayed my convictions. I yielded to the positivist paradigm but I did not reveal this at the time. Hence, betrayal became part of the research itself.

The fourth point is the realisation that making a contribution to knowledge also encompasses learning more about ourselves as researchers and as individuals. This was the mirror of research and it was to be a reflection of whole research exercise.

FINDING MYSELF

The need for engagement and centredness applies as much to the research process itself as to the achievement of TQM. This much is evident from a consideration of my theoretical beliefs, particularly symbolism:

> *"The principle of extension is the belief that unites all analysts interested in pursuing the study of symbolism. It is a belief that when person(s) create either things or ideas about things or indeed ideas about ideas, an investigation of these human creations will reveal information about the creator(s) of that product."*
>
> *(Wexler, 1983.)*

So, what did my re-constructions say about myself? They indicated that I had been separatist in my approach. The most obvious example, and one which I reflected on in a previous section, is the construction of the red versus blue symbolism within Sponsor A. Just as I had identified the potential for TQM methods to be applied in a way which separated subjects from objects and subjects from subjects, so I had applied my own research techniques! I had separated myself from the research experience by compromising my approach in an attempt to appease the positivist paradigm - hence, the separation of subject (me) from object (research). At the same time, I distanced myself and my work from the staff and management within both the sponsoring companies - hence, the separation of subject from subject. In trying to avoid engagement I created my own version of the quality gap and betrayed my theoretical beliefs. By not grounding my theoretical symbolism in my own personal experience and trying instead to draw upon other sources, I was denying my own acts of signification!

This theme of separation was also apparent in the way I tried to justify my own research. As Renan observed (1891):

> *"The critic is he who examines all affirmations, and perceives the reason of all things. The critic runs his rule over all systems, not like the sceptic, in order to find them false, but to find them true in certain respects."*

I tried to play both critic and sceptic, even though I had only claimed to be a critic. The sceptic was my Yakness - my attempt to passify the demands of the positivism which surrounded me within the two sponsoring organisations, as well as within my own University. It was particularly evident from my reliance on other sources (e.g. the Tie Report) for boulstering of my theoretical creations. In contrast, the critic was my philosophical reflections which accepted that 'truth' was a relative concept, anyway. In my Yakness I had forgotten Flew's words (1976) that what is true or false is propositions, whereas what is valid or invalid is arguments.

I was experiencing self-doubt and this lack of confidence resulted in confusion. In presenting my arguments, I became caught up in criteria more appropriate to the scientific school of thought than the subjective approach I had outlined at the start of the exercise. This experience helped me to make another important self-discovery.

> *"HAUNTED FOREST*
> *WITCHES CASTLE 1 MILE*
>
> *I'D TURN BACK IF I WERE YOU!"*
>
> *(Signpost from the film 'Wizard of Oz')*

In an article about the Nobel prizes, Bryan Appleyard (1991) tells us that modern science was born in the 16th and 17th centuries and was a 'masculine' way of knowing. He contrasts this view of classical science with the 'feminine' qualities ascribed to a more subjective approach:

> *"Classical science has a strict view of the position of the human observer - he or she does not exist. What the classical scientist is attempting to do is to build a picture of the world that is "objective". This means that it is real in the sense of being independent of the subjectivity of an observer.*
>
> *And if you cling to that faith, then subjectivity [emotions, feelings] is a serious form of heresy. It mixes the human with the inhuman, masculine mind with feminine nature. It is witchcraft."*

The idea that research can be 'male' (involving subject-object relationships) or 'female' (subject-subject relationships) in its approach is not a new one but its personal significance only became clear once the research had been completed and I had had time to reflect on its presentation. With the help of another sleep-dream, I gathered in some loose threads of the research journey. My dream consolidated my denial of the 'male', positivist features of my work. In Appleyard's terms, I was afraid of being labelled a 'heretic' or 'witch' and so clung on to positivism during the fieldwork. Realising I had lost courage, I tried to hide from these concessions but it was of no use, they continued to pursue me like ghosts demanding recognition. I had to acknowledge them in order to maintain a sense of balance. Trying to deny the existence of either male or female traits within my research was meaningless and broke with the notion of holism. Both subjectivity and objectivity had played a role, whether or not I cared to admit it. The lesson for me was about needing courage in order to be true to myself and to risk making mistakes. Courage, like science, may not be identified with femininity. How much more important is it, then, in the face of 'male' attitudes to research? In conducting work which I believed would be ground-breaking for the two sponsors, I had not had the courage of my own convictions and had submitted to the Paradigm Yak. Now I took the Yak by its horns. I had lacked courage in the act of doing the research but in admitting this found I required even more. It is important for me to relay this message to other researchers.

[Note: Winterson quotes used with the kind permission of Bloomsbury.]

Of course, I regret not having adopted a more collaborative approach. I regret having separated myself from my own research and on another occasion would adopt a more holistic approach, involving the staff right from the earliest stages of the research (assuming that the parties concerned were agreeable to this). In this sense, then, they would become co-researchers, taking an active role in the research process, the sense-making and the production of recommendations. The staff would also have been empowered to act upon their own contexts. My belief is that because I focussed at the individual level, the Findings reflected their concerns more closely than many other more scientific and quantitative techniques would have done. Nevertheless, I fell into my own 'scientific trap', into my own quality gap, as already discussed.

There are one or two areas which I would be interested to explore in another study. One is to concentrate on individuals at a much higher level of the organisational hierarchy. This would provide a view of organisational culture (and TQM) to contrast with that of the staff at the 'sharp end' whose views are represented in this thesis, and offer senior management the opportunity to comment on how they perceive the reported gap between themselves and their staff; if, indeed, they perceive one at all. The issues highlighted in the final reports to sponsors (Appendix 11) were wide-ranging and there is plenty of scope for further work, especially in relation to the future success of UK organisations. With the advent of the European Single Market, there could be exciting, or excruciating, times ahead.

Looking back, I can identify a very pragmatic feature of my experience which might present a challenge to the researcher. I noted in the Journey Through Two Organisations the danger of 'drowning in the data'. This probably applies to much of what is classified as qualitative research. I addressed the problem by restricting the collection of documentation within Sponsor B but how this is done will be dependent upon the individual researcher and, to a large extent, intuitive according to the context. It is also important for me to tell other researchers that I experienced considerable anxiety during both fieldwork studies because I attempted to maintain a creative approach to sense-

making, letting my ideas flow from the data rather than vice versa. It was stressful because I did not know whether these 'creative' ideas would eventually coalesce. (For a detailed discussion of the role of anxiety in qualitative research see Guba and Lincoln, 1989.) Faith in my own research beliefs was fundamental to carrying me through these periods of doubt. If I had not allowed myself to be drawn into the positivist mode and succumb to the Paradigm Yak, I would have been more 'centred' and, therefore, less prone to anxiety; yet another irony exposed by my own weaknesses and lack of courage.

As I reach the last few pages of this thesis, another - perhaps the ultimate - irony confronts me. I adopted the metaphor of journey in order to present the experiences of this research work and, subsequently, chose some words from a favourite novel to underline my theoretical beliefs. Looking at them now, I realise a new depth in them related to my own personal research experience but which I had not hitherto recognised or taken heed of. Winterson (1989) says:

> *"A map can tell me how to find a place I have not seen but have often imagined. When I get there, following the map faithfully, the place is not the place of my imagination. Maps, growing ever more real, are much less true."*

This relationship between map and map-reader illustrates another aspect to the subject-object duality which has permeated this thesis. In Winterson's quote the traveller is the subject and the map is the object. When an object is created to represent an experience (of travelling through the land) it serves to separate the reader from that experience. Objectified by the map, the concept of journey becomes dis-engaged from the traveller's experience. Herein lies the lure of the map. The traveller longs for engagement with the experience that the map seeks to objectify. I believe this partly accounts for the fascination which travel holds for many individuals. It can be the same with research. This thesis becomes the 'map', a map which represents my research journeys and which supplants me, the human subject, in its telling. In creating it, I become distanced from the experience. It, therefore, constitutes an objectification of a subjective experience.

Winterson continues (op. cit.):

> *"And now, swarming over the earth with our tiny insect bodies and putting up flags and building houses, it seems that all the journeys are done.*
>
> *Not so. Fold up the maps and put away the globe. If someone else had charted it, let them. Start another drawing with whales at the bottom and cormorants at the top, and in between identify, if you can, the places you have not found yet on those other maps, the connections obvious only to you."*

Winterson is telling us that not only will experience contrast with objectified theory but also that each individual's experience will do this in a different way. So, not only do we have to be aware of the separatism which subject-object (or even subject-subject) dualities bring into our lives, but also of their neutralising effect: the neutralising of unique and individual experience. The only way to re-instate individual experience is to subject ourselves to it. We have to dispense with separatism and replace it with engagement in order for something to have meaning for us, in order for it to be 'true'. It is our truth and it is a subjective truth. But even this is not enough. There remains a further act of recognition; the acceptance of polysemy. Our truth is as valid as someone else's if it is grounded in our experience. Conversely, we have to accept the existence of other 'truths', other interpretations, other possibilities. This suggests that the journey is never ending. In this sense I echoe Deming's message about the road to quality (Hodgson, 1987). We will never reach a point of saturation because the potential richness of individualised experience mitigates against this. What we see as the conclusion to a journey may be just the beginning for someone else; and their conclusion, our beginning. Reality is a perpetual state of creation and re-creation of meaning. It is this existence of multiple realities, multiple possibilities that Winterson emphasises when she says (op. cit.):

> *"Every journey conceals another journey within its lines; the path not taken and the forgotten angle."*

There are many journeys in this thesis and many lines, thus the possibilities for re-interpretation and exploration are boundless. The call to other researchers is, as Winterson says, to "fold up the maps", go out and create your own from experience. There can be no conclusion only another beginning: another search for knowledge, another engagement, another perspective on 'reality'. I end this thesis, therefore, with the words that I wrote to begin it:

I believe there is no single truth
Only multiple realities
Constructed and re-constructed
On a moment-by-moment basis
By each one of us.

I believe there is no separation
Between subject and object;
We are all subjects -
We affect what we see
And we are all affected.

I believe the world is our mirror -
In our search for knowledge
We find ourselves.

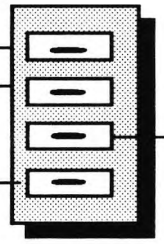
In creating this thesis I found myself.

Welcome to my reality.

THE FILING SYSTEM

The diagrams on the following pages list the contents of my filing cabinets. I am including these because I believe they may give the reader a sense of the influences on my thinking and areas of concern.

THE FILING SYSTEM



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Anderson, J.R., and R.
Applied Learning
Ashridge
Barron. I
B.C.S.
Benjamin, A. and SEMA Group
Blacklaw, P.
Blackler, F.
Bloomfield, B.P.
Blumer, H.
Boland, R.J. (Jnr)
Brooks, F.P.
Capra, F.
C.E.L.
Chorafas, D.N.
Clutterbuck, D.
Collins, A.
Compaine, B.M.
Cooley, M.
COSIT
Coulson-Thomas
C.S.A.
Deegan, M.J.
Downs, S.
Drucker, P.F.
D.T.I. and Government
Earl, M.J.
Eason, K.
Eaton, J.
Ennals, R.
F.E.S.C.
F. International
Friedman, A.
Frischknecht, F.
Guba, E,G.
Gunton, T.
Hales, M.
Handy, C.
Hardiman, B.
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Heller, F.A.
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Hodder, I.
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Holstrum, G.L.
Holtham, C.
Humanities Computing Yearbook
I.C.A.
I.E.T.
I.M.S.
Internal Audit
Intro U.K. Ltd
I.T.I.L.B

Jackson, C.
Judd, S.
Kaplinsky, R.
Kavanagh, J.
Katz and Kahn
Kilmann, R.H.
Kobler Unit
Latham, G.P.
Lessem, R.
Lloyd, B.
Lindstrom, S.F.
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McPherson, P.
Mangham, I.
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Miles, I.
Monaco, J.
Monger, R.F.
M.S.C., Y.T.S., Training Agency, ITECs
NABS & Building Societies
Naisbitt, J.

Sponsor B -
Highly Confidential

NCC
NCVQ
NEDO
Neale, I.M.
New Scientist
Nurminen, M.I.
Open University
Pacey, A.
Pagoda
Pearn, Kandola, Downs
Pondy, L.R.
Ponzio, A.
Porter, M.C.
Prudential
Pruyt, H.
Pyburn, P.J.
Rajan, A.
Reason, P.
Rogers, C.
Rosow, J.M.
R.S.A.
Sackmann, S.
Schuurman, E.
Senker, P.
Seward-Thompson, B.
Simon, H.A.
Somogyi, E.K.
Sprague, R.H.
Standard Chartered Bank
Strassman, P.
Turkle, S.
Virgo, P.
Webster, J.
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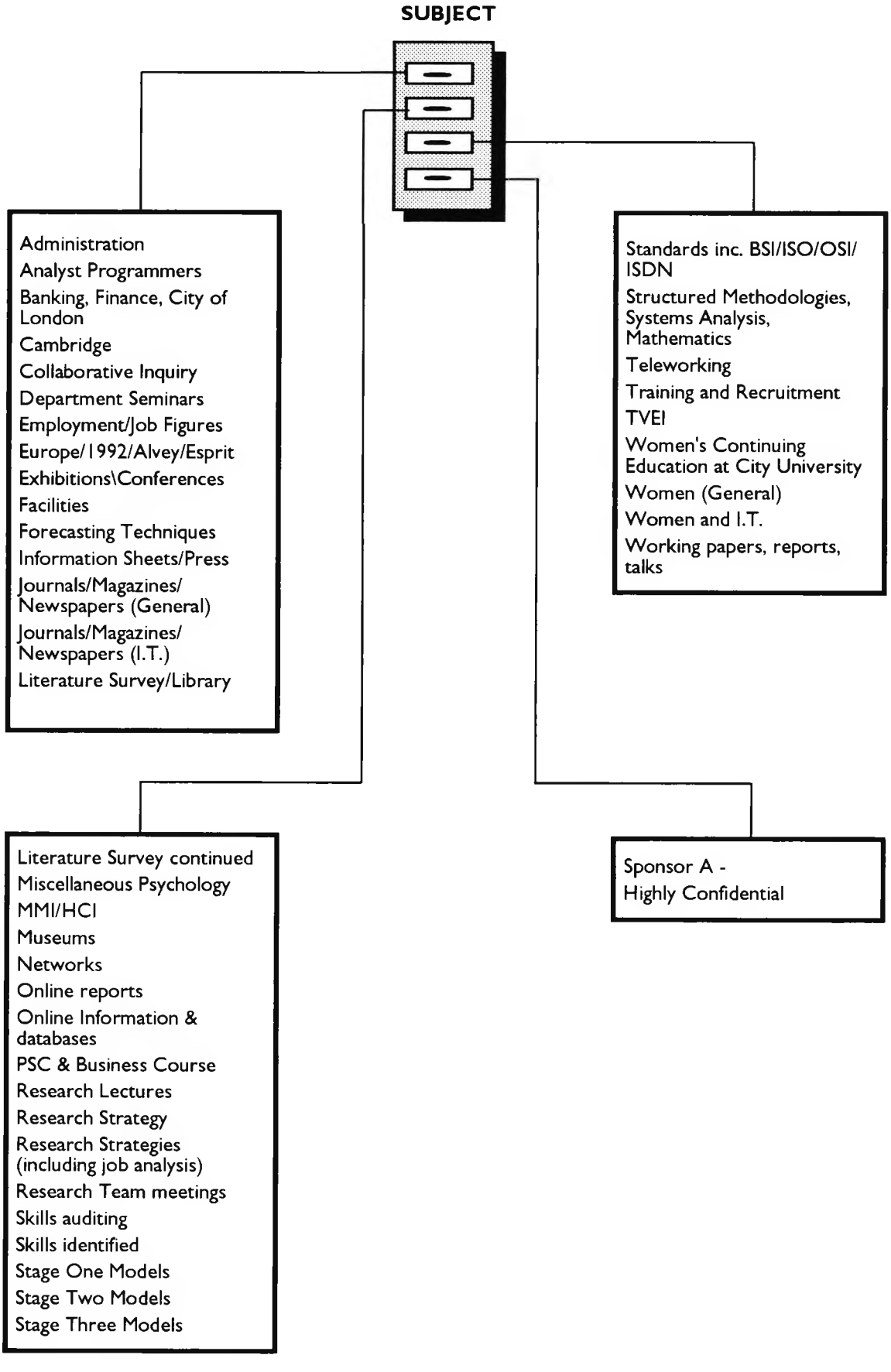
Zuboff, S.

THE FILING SYSTEM



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APPENDIX 1

UCCA Application Form

UCCA

Application for October 1985

Attach your £4 applicant's fee here. Do not staple.

First read page 4. Print boldly in black ink.
This form is reduced when photocopied.
Do not write in green boxes.

3 Choice of university and course

Make no entry here until you have read the current UCCA handbook and universities' prospectuses

Bracket if equal preferences

(a) University/College code name	(b) Univ code no	(c) Course code	(d) Course code name	(e) Previous application (year)	(f) Enter any other details here only if requested by the university/college in its prospectus or the UCCA handbook	H
CHM/L.CAV	15	LV66	ARCH/ANTH			
BRISL	12	VL77	PHIL/PSY	1976		
DUR/NO	20	LV66	ARCH/ANTH			
EXETR	24	LV77	PHIL/PSY			
SUSX	89	ML97	CompAI/Scc			

If you have previously applied through UCCA please give serial number of your most recent application 303396

APPENDIX 2

Main Issues Arising from First Bibliographic Search

(Working Paper)

CITY University
BUSINESS SCHOOL

MAIN ISSUES ARISING FROM FIRST BIBLIOGRAPHIC SEARCH

Written by Carole Brooke

CIT Research Scholar

RESEARCH INTO THE FUTURE IT SKILL NEEDS OF THE CITY OF LONDON

WORKING PAPER NUMBER 2

Centre for Personnel Research and Enterprise Development
City University Business School
Frobisher Crescent
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London EC2 8HB

November, 1988

INTRODUCTION

As indicated by the original Brief (reference 1) research will monitor and predict the IT skills climate in the City of London with respect to the next five to ten years. The relationship between IT skills and the ability to maintain a competitive edge in business, particularly in the finance sector, will be of central concern. The stipulated timescale will encompass, for example, issues relating to 1992 and the single European market. Such processes of CHANGE and their implications for the IT skills climate will, therefore, form an important part of the study. For this reason it has been useful to identify the following stages during the literature search:

STAGE 1: Change is initiated by certain triggers. Examples of such triggers, and their implications, will be discussed under Stage 1.

STAGE 2: Once an organisation is aware of the implications of change, it needs to consider how these will affect its own corporate strategy. New circumstances may call for a new response, and an analysis of internal organisational culture and policies will be necessary before this can be ascertained.

STAGE 3: Having identified the key issues for action, any changes that are to be made have to be managed effectively. Aims may be clear

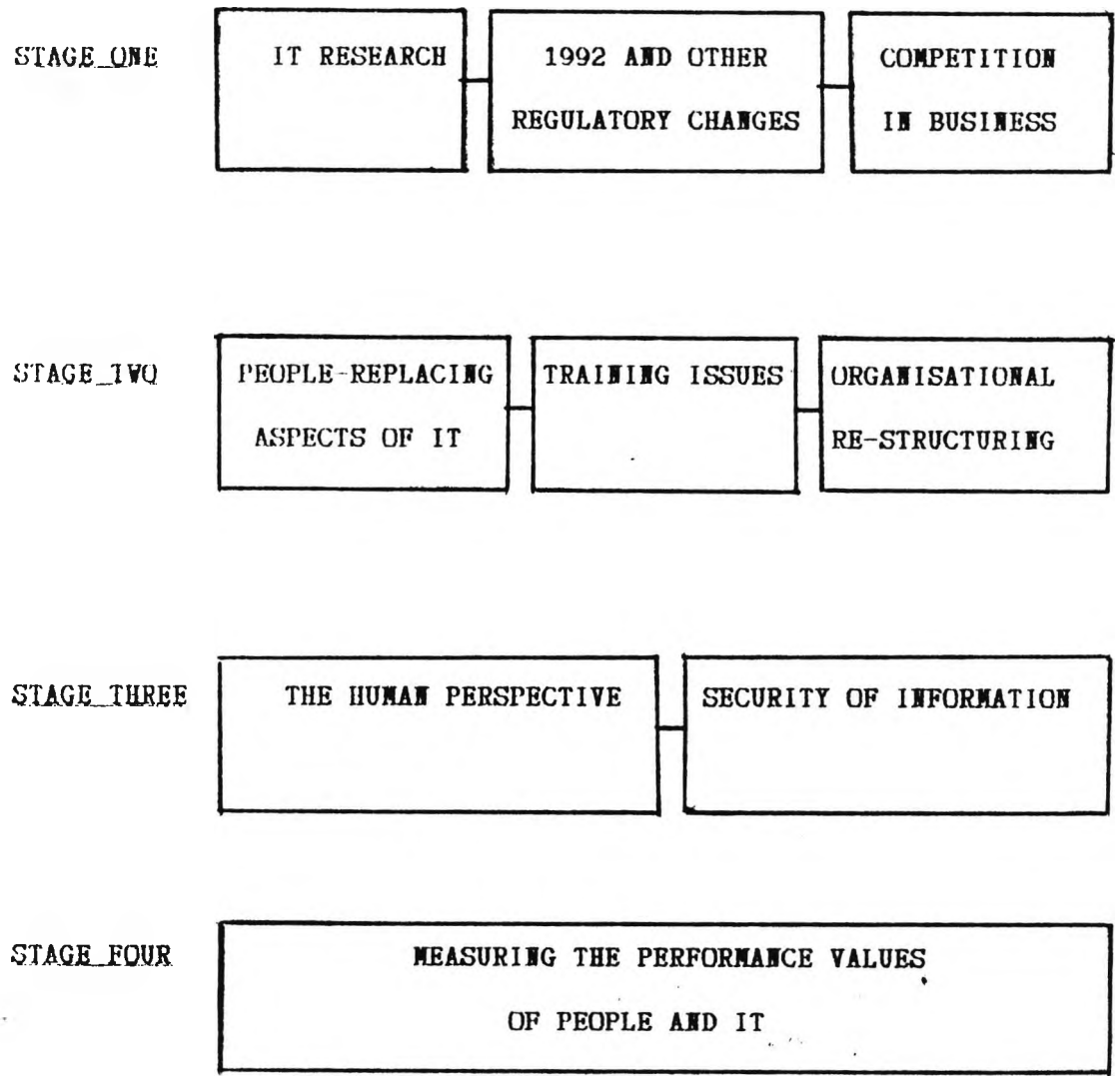
but appropriate methods need to be carefully selected in order to achieve success. The happiness and cooperation of employees will decide this to a large extent.

STAGE 4: Once change has been implemented within an organisation, regular reviews of its effects should be carried out. This reviewing procedure will provide the opportunity for an organisation to determine whether or not its newly adopted strategy is both internally accepted and externally competitive.

Change requires that a business continually re-appraise its aims and methods. One aim of this project should be to set an example, ensuring that it always applies the most appropriate methods to the scenario under study.

Figure 1 illustrates the major themes identified during the first bibliographic search and is arranged according to the 4-stage process of change, as outlined above. It is hoped that, having considered the themes and issues here presented, those involved in the project will be able to identify the particular areas which they feel research should

FIGURE 1


STAGE ONE
IT RESEARCH
1992 AND OTHER REGULATORY CHANGES
COMPETITION IN BUSINESS
STAGE TWO
PEOPLE-REPLACING ASPECTS OF IT
TRAINING ISSUES
ORGANISATIONAL RE-STRUCTURING
STAGE THREE
THE HUMAN PERSPECTIVE
SECURITY OF INFORMATION
STAGE FOUR
MEASURING THE PERFORMANCE VALUES OF PEOPLE AND IT

STAGE 1

Change in the use of IT is discussed here with respect to developments in IT research and to changes in the laws governing the conduct of financial business. Taken together, these triggers account for many of the events that have been witnessed in the City over the last couple of years. With an expected annual growth rate in IT markets into the 1990's at between 15% and 25%, continued change is inevitable (reference 2).

IT RESEARCH

Developments in the field of IT have been rapid and wide-ranging and it would be neither possible nor relevant to mention them all here. However, it is relevant to consider the current situation in the UK and Europe with regard to research initiatives since such initiatives provide a key to future directions.

Several large-scale IT research projects have been initiated in order to maximise IT's contribution to business. ALVEY was set up to run for five years, funded by SERC, and encouraged collaboration between research and industry. It created a stimulating environment for IT experts helping to slow the brain drain to the USA. This programme has now ended and a new national programme called IT '88 is being funded jointly by the DTI and SERC (reference 3). The final list of chosen projects for funding under this research will be drawn up at the end of 1988. The emphasis of IT '88 is on interdisciplinary work and is seen as providing a chance to gain a

competitive advantage over our European colleagues. France and Germany, for example, still have separate research and industry ministries.

Particularly because ALVEY had already built up a pool of expertise (especially in software skills) the UK was welcomed into ESPRIT (European Strategic Programme for Research and Development in Information Technology). ESPRIT was launched in 1984 by the Commission of the European Communities, focussing (like Alvey) on pre-competitive cooperation. The Commission is currently drawing up "The Framework Programme" which is a detailed blueprint for the European high technology cooperation required to give European industry an internationally competitive position in the open markets of the 1990's (references 2 & 4).

A second planned European programme, EUREKA, is currently underway and is concentrating on IT, telecommunications, robotics, biotechnology, materials, energy and transport technology, manufacturing and environmental protection. Although EUREKA will create standards in the same way as other projects have done, it will also aim to remove technical barriers to trade and to open up a public procurement system (reference 4).

Work on such projects has taught the IT community to be more sensitive to market needs. The participation of users is emphasised to infuse a sense of perspective (see also Preliminary Report Number 1), although the question of how far this has been taken by developers and managers of IT will be addressed further below.

Since most large firms prefer to work alone, the question could be asked, "to what extent are companies willing to take part in collaborative exercises?" With the onset of 1992, this may become less of an issue, as the UK strives to maintain a competitive edge in the European market.

Technological change can lead to improvements in both processes (speed and quantity of information) and products (innovations and reduced production costs), but it is the speed of information processing itself that will decide who leads in financial markets. Already, office-based computer processing speeds have reached very high levels. For example, Atari have produced a PC system called Abaq, a transputer workstation that can process 10 million instructions per second (10 MIPs). It can also perform financial modelling. In terms of MFLOPS (millions of floating operations per second), the Cray-4 64 processor computer is expected to be functional in the 1990's at a faster rate than the current Cray-2 which operates at 1700 MFLOPS (reference 5).

Machines can scan information very quickly and, therefore, act upon it much faster than a human. (This is the essence, for example, of SEAQ.) The important issue here is that the human-machine relationships are continually changing. Technology is now at the stage where it could be argued that machines no longer exist to support people but vice versa.

1992 AND OTHER REGULATORY CHANGES

1992

City firms may take some comfort from the fact that the City European Committee has been set up to ensure that 1992 does not disadvantage them in any way (reference 6). But what of the known implications? The single market will consist of over 320 million consumers, larger even than the Japanese or American markets (reference 7). This presents a challenge on two fronts: internal company organisation including marketing and service support, and sales strategies. 1992 will put a premium on obtaining accurate information fast and will be crucial to effective decision-making. Information Technology will be an essential management tool.

With so many changes taking place across Europe, how can the average business keep apace? The DTI provide numerous information channels but, this aspect is also being taken up by private sector information services. For example, INFOMAT (reference 8) are providing a 1992 European Alert. The information is conveyed either through the post in the form of a weekly bulletin (plus summary of key issues), or via an on-line database. Whereas the Government and DTI could be seen as having a politically vested interest in reports leading up to 1992, the private sector are not so 'biased'. Therefore, a niche for such services is evident.

A European single market will call for the development of common standards and the DTI have mentioned the desirability of working towards integrated networks (reference 9). In theory, the National Computing Centre will be

responsible for ensuring that standards are maintained. On the microcomputer front, a universal operating system could be devised. One idea for microcomputers - UNIX, which originated in the USA, is currently in use. However, trying to enforce a universal operating system seems unrealistic, particularly in the world of mainframes. IBM, for one, have such numerous and diverse mainframe systems that they are not even compatible with eachother; a question of basic hardware incompatibility. Nevertheless, it is interesting to note that, in the PC field, it is IBM who are forcing the standard.

If economies of scale apply to IT, 1992 could lead to collusion on the part of companies in an attempt to keep out other competitors, either at home or abroad. In the UK this could have implications, particularly, for smaller businesses. If large companies close ranks, the European market may become 'monopolised'. Thatcher's political climate has produced an increase in small businesses. The next five to ten years could be crucial to their continued survival. Also, in the event of such a monopolisation, the whole field of IT may be affected if there is a downward trend in the motivation to innovate. However, this needs to be viewed in the context of a possible move toward the customisation and differentiation of products, which is discussed further below.

OTHER REGULATORY CHANGES

Increasingly, deregulation of the telecommunications and broadcasting sectors is leading to information becoming the foremost international

commodity and a vital element of economic activity in general (reference 2).

A consequence of the deregulation of financial markets has been that all kinds of financial institutions now offer a full portfolio of services. This has created a new dynamism in the financial marketplace and a need for financial and strategic information on building societies and insurance companies (reference 10). This increased financial competition calls for a data base from which to monitor own and competitors' performances. Some of these issues were discussed in Preliminary Report Number 1 (for example, TEKRON and FIND databases), and points are made later in this report, particularly as regards maintaining a competitive strategy in the European market. Since $^{9}/_{10}$ adults in Britain indirectly invest in the Stock Market this area should be of broad interest (see reference 16).

The International Stock Exchange itself has been fundamentally affected by the introduction of new technology. In October 1986 the Stock Market switched over to a new computerised system called SEAQ (Stock Exchange Automatic Quotations). SEAQ is a view-only system, not a dealing medium. It displays the latest prices with a constant on-screen update (called real-time prices). In this way, the rise and fall of the market can be seen in action. Since, the UK straddles the dealing times of the New York and Tokyo floors, this offers an excellent opportunity for the UK to develop a lead. The inevitable expansion of the market, with increasing specialisations, will also lead to the production of new skills. Thus, the UK's lead will depend to a large extent on its success in fulfilling these new skill needs.

COMPETITION IN BUSINESS

In her report, Shelagh Heffernan states that the dynamic nature of technology calls for a broad approach in the finance sector (reference 11). Institutions will be looking to provide more than one service since "the degree of substitution between financial goods and services will be a determinant of competitive structure and strategy". This situation is already apparent following changes in the regulation of financial services. Consequently, institutions will be in greater competition over a broader range of services, whilst consumer expectations of their expertise will be heightened.

Another observation concerning the nature of information technology is that it demonstrates the Domino Principle. For example, when the Stock Exchange introduced IT into its operations, the market had to respond in order to continue dealing effectively. The importance of this realisation lies in the fact that IT is a prime vehicle for competitive strategy. A quote from Lord Young, illustrates the current business climate and the need for "Information Technology research to be converted into successful products" (reference 12). Although factors like 1992 will inevitably present new issues for consideration, there will be an on-going number which need re-asserting with respect to maintaining a competitive position. One of these is training. IT is already being used by business to achieve a competitive edge; some database examples were given in Working Paper Number 1. In order for business to be able to continue to do so effectively, IT needs to be considered as an integral part of any corporate strategy. However,

effective IT management requires the appropriate skills and knowledge. Issues relating to training strategy are discussed in Stage 2.

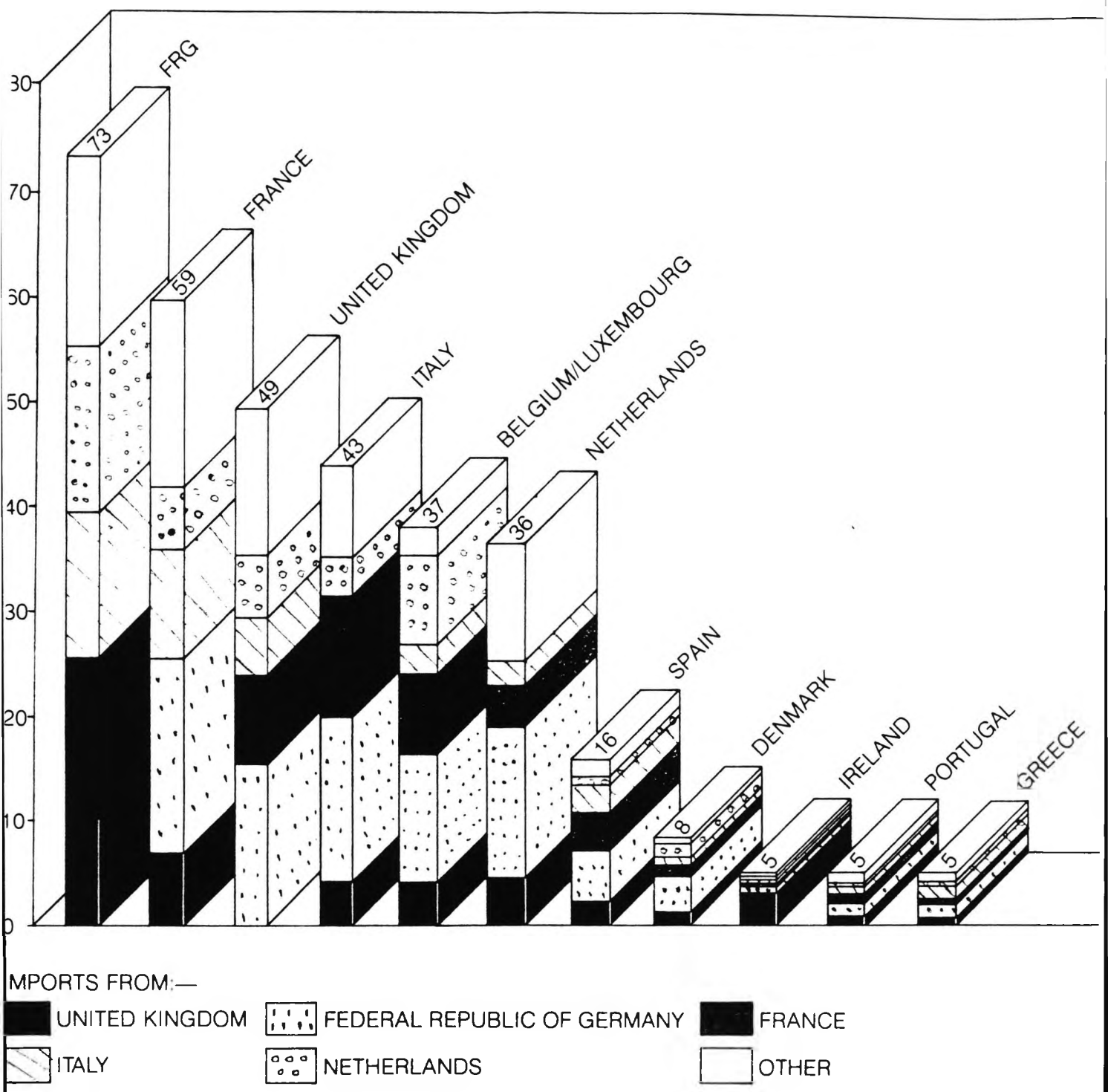
Heffernan defines competitive structure as the 'relationship between prices and the long run marginal costs of production' (reference 11). For the finance sector in the City this presents several problems: (a) marginal costs will change as rapidly as the industry in its response to the marketplace, and (b) the basis for the City's competitive edge is its ability to respond to unique and individual needs. In other words, product differentiation rather than product homogeneity. This environment has the potential to generate high costs, whereas the homogenous scenario focusses on achieving the lowest price for a standardised product. Product differentiation could have important implications for the City with respect to the regulatory changes that have already been effected, as well as the coming of 1992. As the UK enters the European market, the City will need to be aware of how its products are going to fare and this involves understanding the general European trend toward product differentiation. Figure 2 illustrates that the Federal Republic of Germany has been most successful so far with exports to the rest of the EEC (reference 9).

The UK finance sector may become characterised by particular, rather than general, expertise. Where increased customisation persists, competition will centre on the ability of City institutions to provide the necessary specialist and problem-solving skills. This situation can be considered in conjunction with Strassman's notion of role specialisation (reference 20).

FIGURE 2

TRADE BETWEEN MEMBER STATES

Total imports from other EC countries 1987, £ billion



He has suggested that developments in IT will not so much result in a drop in employment levels but, rather in the "upgrading" of job types. The basis for this idea is that IT is quickly and easily able to automate the more routine functions performed by individuals within an organisation. At the same time, IT will not only enable services to be broadened through increased speed and efficiency but, also for individual roles to be developed and expanded, providing more job satisfaction for the employee. This positive interpretation of the affects of IT upon individual roles concludes that a similar affect will apply right up the organisation hierarchy, such that each level in the hierarchy will be called upon for their expert and specialist, rather than their general, capabilities.

Taking this notion of internal role specialisation, together with that of product customisation, it may be that there is an urgent need for the re-orientation of current employment and planning policies, particularly in respect of IT skills. The project could examine this hypothesis by assessing to what extent these two notions are manifest in the City and by considering how best to respond in the circumstances.

Another issue which seems to permeate the literature with respect to competition in business, is that of the conservative style of British management. This is so often linked to an inadequacy in formulating competitive strategies, that it appears as a taken-for-granted. Certainly, the media sees a need to bring to the attention of managers the fundamental importance of assessing European competition, and of analysing their own competitive standpoint. Articles on 'how to get ahead' and surveys of experiences from readers are becoming more common. (One approach suggested

was to consider how companies deter competition by their response to technological developments and to changes in law (reference 13)).

Ultimately, management may be assessed on its ability to introduce IT successfully (reference 14). Where other European countries have already succeeded in doing so, this will put more pressure on the UK in its efforts to maintain a competitive edge. The suggestion seems to be that the UK is not as well prepared in these respects as the rest of Europe. Is this really the case? The project could explore this question and make recommendations for corrective action as appropriate. If change is required, it will have to come at both corporate and individual levels, and is likely to be of an all-pervasive nature. Managers may need to think differently in order to ensure that they are adopting a competitive viewpoint at every stage of the business plan.

STAGE 2

PEOPLE-REPLACING ASPECTS OF IT

IT is not only in competition with other users in the marketplace but is also in competition with the humans that use IT. In general, it is assumed that an increase in technology will lead to a decrease in staffing levels. However, it is interesting to note the example of the major clearing banks, where there has been a tendency toward increased personal services, particularly where branches have installed fully automated systems (such as statement requests, balance enquiries, credit payments, etc). Many branches now have 'consultants' at open plan desks in the public lobby. Part of this trend is also due to the increase in the number of services now provided by high street banks. This example could be used to reinforce the earlier point of Strassman's, that the main effect of IT will not be to decrease employment levels but, to initiate role changes (reference 20).

IT's ability to improve on the performance of a human worker is directly relevant to future developments in the finance sector. In "The Money Programme" one interviewee said: "There are too many fund managers. Computers are better at speed, prediction and accuracy because they have no gut feelings... they operate entirely on statistical information" (reference 15). His point was not that fund managers become redundant but that the way in which they performed their jobs should change. He commented that the worst fault of a user was to try and think for the machine. The package which he had been using for financial dealing had so far made losses below and profits above the human average. However, as one

expert remarked, if a computerised system is that good, everyone will soon be using it and, therefore, its competitive advantage will be lost. The buy/sell margin logic would also disappear. Computer specialists, when posed with this situation, responded that it was solved by continually improving the available systems. Far from being a problem, software programmers seemed to see this as a challenge.

American dealers already use systems that constantly 'think' ahead and advise staff on financial strategies. Professor Merton, of Harvard Business School, commented during the programme that the development of strategy versus the ability to process information could lead to a market breakdown. In other words, there may be a ceiling beyond which the machine cannot go and at which point the whole concept of competition on the financial front becomes meaningless.

There are some issues worth considering here. Too much dependency on computers could lead to a situation where they are no longer properly supervised. As mentioned in Working Paper Number 1, it was a computer-driven dive that fired the Stock Market crash of Black Monday. In the Money Programme, Ian Reid of Data Logic said "we are more likely to learn from crashes than from forethought" (reference 15). It would seem that faith in the competency of technology is such that its potentially serious weaknesses are often over-looked.

In support of this point a member of the Stock Exchange's technical staff can be quoted from a recent meeting (reference 16). When it was pointed out by a delegate that such dives were a risk to the health of the market,

he replied that UK dealers do not like interfering in such cases but prefer to believe that "the market has a message". In contrast, since Black Monday, the USA practice a stalling procedure whereby an initial dive will trigger a one-hour break in dealing. If the dive continues once dealing has re-commenced, then a two-hour break is called, and so on, until the market has reached some kind of equilibrium.

In considering some of the more negative products of IT usage, there are specific issues which need highlighting in relation to the effective application of IT in business. These include the dangers of information overload (the "unmanageability factor" of IT), mis-matching of job and tool kit, and the lack of planning devoted to IT implementation. It is often forgotten that IT may not always be the best solution to a problem.

TRAINING ISSUES

A National Computing Centre report has predicted that in the next two years 35,000 staff will be added to the current pool of IT workers, rising to 51,100 in the next five years (although this is probably an under-estimate). Whilst the finance and business services sector predicts a 50% increase over the next five years in IT staff needs, over and above current levels (reference 17). Whatever the exact statistics, there is clearly an urgent need for trained personnel.

The ever-decreasing number of graduates currently seeking employment coincides with a rise in the number of jobs requiring graduate-level education. However, this emphasis on graduate employment can be

challenged and a new approach to re-training encouraged in order to help fill the skill gaps. Most sectors of business agree that the actual subject of a degree is unimportant in equipping a graduate for IT work. On average only 14% have computing science degrees (reference 17). Since technical competence can be taught, then, it seems logical to suppose that there will be many other prospective employees who will be able to similarly re-train.

It is also apparent from advertising literature that new IT products are being tailored for the non-technologically minded. One leaflet announced that its product "minimises the technical expertise required to use a PC" (reference 18). A trend towards non-scientific staff calls for their increased overall training and updating in technological innovations. Undoubtedly, in the first stages, companies will look to outside help in meeting these training needs, either through consultancies or institutions like CUBS.

Independent consultancies have not been slow to appreciate the skills gaps which are occurring in IT. Many offer 'DIY' software training packages but a few, e.g. I.M.S.L., offer personal training services and have the approval of the DTI (reference 19). Database companies are also offering free seminars, conducting user surveys and making promotional offers in order to attract business. Essentially, this is an effort to maintain a competitive edge by way of upgrading their user support and training services.

The emphasis of training itself has changed. "Pick what you want and plug it in" has been used to summarise the situation (reference 15). Whilst this calls for new user skills, it also calls for increased knowledge on the part of employers and employees concerning the tools that are on offer. Managers, above all, will need to develop their own expertise if they are to ensure they obtain maximum performance from their IT systems.

A change is called for in attitude towards IT training for business and this will be a difficult task. The UK's record for investment in training is very poor. As far as IT is concerned, funds are usually ploughed into the technical side rather than into the human training needs. According to Strassman, this is an imbalance since he argues that the long term costs of system implementation will always outweigh the actual design costs (reference 20). This argument can be upheld if one considers the processes involved in either case.

The most costly element of system design is research and development. However, the majority of systems implemented within organisations are well-established, mass-produced models. The bulk of the differences between such systems reside in presentation and packaging, rather than in basic technological constituents. Major R&D developments are often either one-off experimental models (e.g. Cray-2) or new applications of old ideas (e.g. transputers). These may be expensive upon first introduction to the market but usually decrease in cost with time.

The cost of systems implementation, on the other hand, is often under-estimated by management. Most of this cost relates to the processes of

introducing the system, training its users, and maintaining effective performance both technically and culturally. A poorly managed implementation can result in the long term loss of efficiency and motivation. Getting a piece of technology to achieve its highest level of performance is a more straightforward and, therefore, initially cheaper, matter than maintaining a high performance level amongst all its users and managers.

Changing attitudes towards training will need to go beyond this, however. A good example of how entrenched attitudes have become at management level was seen at a recent meeting to discuss opportunities in the IT field (reference 21). All of the speakers stressed the complex nature of IT and the difficulties of entering the field without prior training, particularly if over the age of 30 years. Over the next five years, the prediction was that the growth area of IT could well be in the marketing/sales side and not in programming. It was suggested that there were opportunities in the marketing and sales functions for people from the older/untrained groups with good communication skills but, beyond this the overall feeling was rather negative. In response to a suggestion that employers needed to be re-educated with respect to future IT skill-matching and recruitment methods, one speaker commented that he would rather "get his education elsewhere". He was referring here to the all too familiar phenomenon of poaching (either directly or through an agency) rather than re-training internal or external staff. City specialists are particularly guilty of this. They are also the most frequent users of external consultancies for technology and computing.

But what will happen if this attitude continues? The USA and Japan have already moved in on the dealing markets and, following 1992, the number of participants will be further increased. Yet, the number of available trained staff will remain small. At present, two years is the average stay with one company in the IT field (reference 21). Continued 'poaching' will lead to more job-hopping which, in turn, will only strengthen the unwillingness of employers to provide training. Some businesses have tried to resist the affects of poaching by building up internal pools of expertise. To an extent, this has been practiced by UK banks who suffered at the hands of their foreign counterparts (reference 22). In the circumstances, though, the best course of action is to widen the pool of staff as much as possible, thus reducing the need to poach. However, in order to do this, people need to be encouraged to re-train. The initiative, then, has got to come from business.

What potential employment markets could be tapped to help allay the skills crisis? Although IT is still a male-dominated area, the number of women entering science and technology has increased in the UK and single sex schools, at least, have a higher level of women entering the computer field (reference 23). Women's training could have great potential for meeting the needs of IT, 1992, etc, because it has so far aimed to make women more skill-flexible in order to give them increased confidence and marketability in the job sector. Their training has, therefore, tended to encompass IT developments. (Women and Training News are launching a "Women into IT" campaign (reference 24).) Whereas women have been almost forced to grasp the IT nettle, those secure in work may have become complacent and less aware of changes on the IT front. Women already in jobs may have to fight

harder for training in new skills, however. Managers have tended to be loathe to release their staff for training (especially those in support roles) since, traditionally, training is seen as an expense not an investment.

If women returners, together with individuals from the unemployed sector, could obtain sponsorship for training, this would provide a much needed injection of skilled workpower. The Department of Employment run Career Development loan schemes designed to help individuals further their careers or to train for new skills. This option may be of special interest with respect to IT (reference 25). Another possibility is the conversion courses. These were introduced by the Manpower Services Commission in an attempt to respond to the general shortage of technologists throughout Europe (reference 21).

The DTI are encouraging businesses to review their recruitment behaviour methods. Their 1992 information pack for business provides a lot of useful information and contacts for employers and the Action Checklist gives basic procedures for evaluating existing recruitment strategies (reference 9). The Checklist emphasises that people are a company's most valuable resource; indeed, they are its only unique resource. Since the UK currently spends less on training than any other EEC country, the Council for Management Development and Education has been set up to look at this in preparation for the single European market. The DTI are providing the telephone numbers and addresses of bodies that give training advice, including the DTI's own Finance and Information Initiative and Spearhead

database. Upon request, the DTI will despatch printouts of seminars and conferences which are being held on relevant topics around the country.

The DTI literature also highlights the following points for action: IT as a competitive 'measure', identification of opportunity for IT usage, compatibility of in-house systems, competitors' use of IT, and preparation in order to take advantage of further developments in IT. Of particular interest was the referral to 'Employment Training for the Unemployed' and the comment that this will be "an increasingly important source of recruitment as the number of young people declines".

Turning now to the subject of Information Technology as a discipline, what efforts are being made to introduce IT to potential trainees and to promote its professional standing?

The British Computer Society runs a Professional Development Scheme (PDS) which works on the basis of credit units (reference 26). Student members work towards the next level of membership by completing a number of set tasks (witnessed by an appointed supervisor) and by taking exams. All tasks are performed at the student's place of work and the company has to pay a fee in order to take part in the scheme. (Possible problem here of uneven standards between companies?). Qualifications offered include T. Engineer and C. Engineer.

This raises the issue of the classification of the IT field as engineering. At a time when the public image of the engineer is at an all-time low, prospective candidates for IT qualifications (of C. Eng and T. Eng) may

feel slightly apprehensive. Whilst engineering is a highly skilled vocation, the question of how best to educate the public in terms of its image should be considered carefully. Incorporating IT into the engineering field may help, but may also serve only to confuse or delay recruitment of such 'non-scientific' groups as were referred to above.

The Royal Society of Arts is also making its contribution to IT training needs by introducing a set of Vocational Qualifications (reference 27). They are aimed at those without an advanced level of academic training, although the Advanced Diploma will cater for A'level standard students who also have work experience. This course is particularly useful in that it highlights the importance of effective communication and puts students on the design side of the desk as well as on the user side. This approach helps to encourage future systems designers to include the human element early on in their work. The scheme works on a similar basis to the PDS scheme, assigning credits at each stage and helping to build a marketable CV for the student.

With regard to further education establishments in general, there is a current trend towards the introduction of qualifications with IT elements, such as MBA's and business courses (reference 23). These are more common in other European countries and, as a result of 1992 changes, an increased emphasis may be placed on obtaining such qualifications.

Media efforts to spread knowledge of IT include a series of 25 minute films currently showing on BBC1 (to be repeated in Spring 1989 on BBC2).

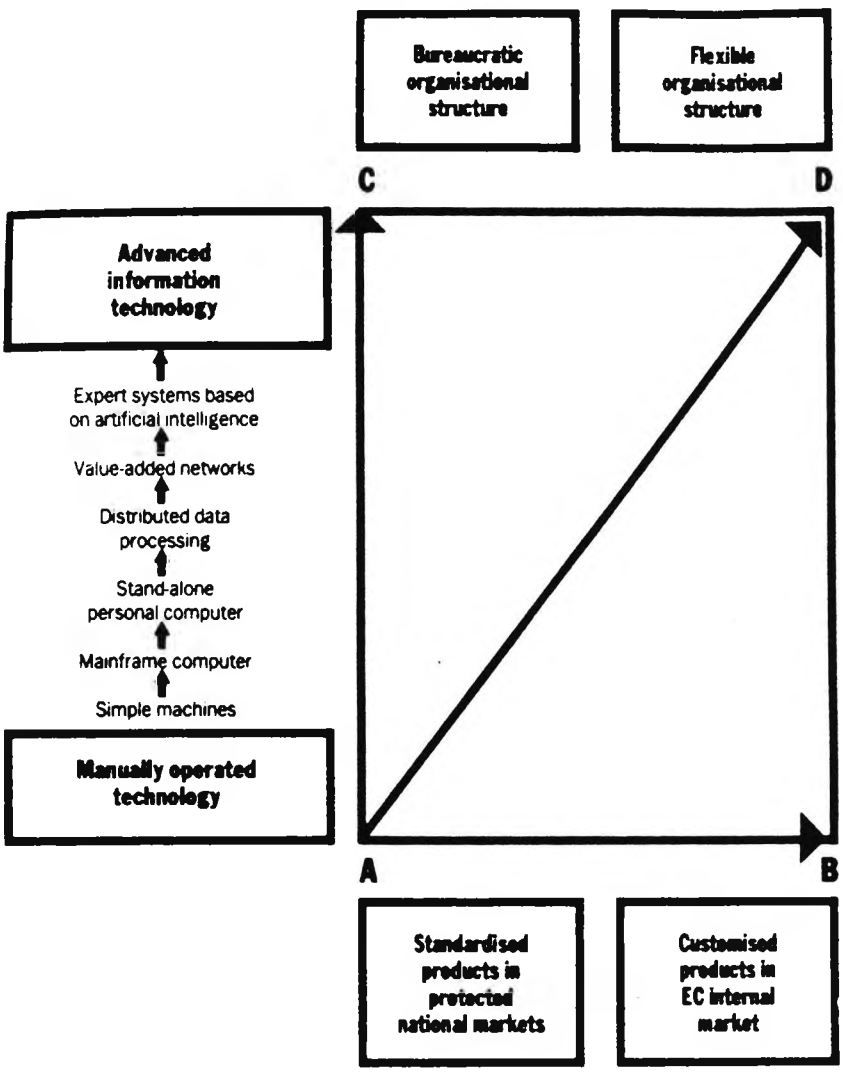
Produced in association with BTEC, the series will cover social issues of IT usage together with the little explored subject of software failures.

ORGANISATIONAL RESTRUCTURING

In the press review of "Create or Abdicate", a survey conducted by the London Human Resource Development Group (LHRDG) (see Figure 3), Rhiannon Chapman draws attention to the trend towards customised products in a European market (reference 28); see earlier remarks on product differentiation. The City has become more knowledge and skills-oriented as a result and this calls for a flexible corporate organisational structure, with de-centralisation of control and decision-making. This, in turn, requires a particular corporate culture, one which provides a supportive and participative environment, encouraging innovation and self-development.

It could be argued that British management tends not to adopt this sort of corporate culture. As mentioned above, they are often seen as more 'conservative' in their approach. The project could look at how British corporate cultures differ from their European counterparts and assess whether compatibility of organisational cultures is important for successful relations in a European single market. As the UK moves towards 1992, the standardisation of such British personnel practices and the development of compatible inter-organisational cultures could become increasingly important for achieving success in business. As this is such a broad area of research, the project could focus down onto those areas which specifically relate to IT skills training.

FIGURE 3


Bureaucratic organisational structure
Flexible organisational structure
C
D
Advanced information technology
Expert systems based on artificial intelligence
Value-added networks
Distributed data processing
Stand-alone personal computer
Mainframe computer
Simple machines
Manually operated technology
A
B
Standardised products in protected national markets
Customised products in EC internal market

Changes in organisational structure are already apparent as a result of the increase in desktop communication generally. Home banking, teleworking and portfolio management packages are examples of this (references 1 & 29).

The Henley Forecasting Centre predict that 20% of employees will be working from home by 2020 (reference 29). What are the implications of this? For instance, could London property prices drop and could London become a healthier place? For a woman, the choice between career and family could be relieved; F International are well-known for their initiatives in this respect. New "satellite offices" could spring up in provincial areas heralding a general decentralisation of the workplace. Time at a worker's disposal would become quality rather than merely quantity time, leading to improved efficiency and job satisfaction. Time, money and stress could be saved for both employer and employee.

Such decentralisation can be seen in the potential of systems like "Market Eye" at the Stock Exchange (references 16 & 30). This provides a direct line to home or office via the TV; no need for telephone lines. It is designed for banks, building societies, investment advisors, financial directors, accountants, solicitors and private investers. What would be the affect on the City as a centre of finance and control and what affects would it have on the employment market more generally?

With respect to actual roles within organisations, there are also signs of change. A Sunday Times article discussed the growth of a new type of Office Manager, called the Facilities or Premises Manager (reference 31). This role apparently has a wider range than the traditional function and

calls for someone versed in such processes as assessing new sites for offices as well as all re-location needs. The point here is that the environmental needs of staff are fundamental in ensuring continued recruitment success. (The familiar 'sick building' syndrome demonstrates this.) The introduction of IT without proper planning of the working environment is a common phenomenon. With the coming of 1992, the European Community could make this a major issue with respect to health and safety regulations.

In this situation, the training of Managers to fill posts such as Facilities Manager, becomes a focus for concern. Where will companies find such people? The recruitment consultancy is a perennial solution but the possibility for re-training the existing Office Managers is all too often over-looked. The single market may increase the number of businesses involved in re-location and/or expansion abroad. Since the post is quite new, it is logical that there should be an effort to create a pool of properly trained staff in this country in order to cope with future needs.

Meanwhile, a British Airways advert was seen in a newspaper recently for a Human Resources Adviser in IT (reference 32). This reveals concern for, and awareness of, future changes in IT versus the corporate issues of organisation and re-structuring. It underlines the need for capable direction of management by people skilled in the IT field.

Other new roles will emerge during the course of this research and one aim of the project will be to predict such trends. At a Women In Management meeting it was suggested that Network Analyst and Communications Co-

ordinator will be two new roles in IT (reference 21). Both of these reflect the importance of overall direction and integration in business communications systems of the future. 1992 may also serve to augment the importance of such roles, in terms of integrated networks (as discussed in Stage 1) and the speed of information processing.

STAGE 3

THE HUMAN PERSPECTIVE

Organisational restructuring involving IT needs careful consideration, especially since IT is not a quick-fix solution but, a resource like any other. Furthermore, it is a social product and its ability to create 'winners and losers' is often unappreciated (reference 14). In business, the development of IT will inevitably incorporate two levels: issues concerning the business strategy and issues relating to the employee-user. This conflict of group interests (broadly speaking the employer versus the employee) constitutes the political element of information technology. IT should, therefore, be viewed in its political and social organisational context, and management will have to develop political and cultural support for its objective, by identifying and responding to these various interest groups.

It has been said that in a crisis the conflicting interests of groups in an organisation are diminished as the business struggles to regain equilibrium (reference 14). 1992 could be seen as a similar sort of binding factor - presenting a challenge that will bring people together in organisations? On the other hand, trade unions will need to be convinced that such co-operation is in their interests. It would be interesting to compare their responses to those of other European organisations.

IT developments are already known for their tendency to omit the human perspective from the design stage onwards. ALVEY initiated a programme called Man Machine Interface (MMI) which underlined the importance of including the human factor at the design stage and introduced the idea of ergonomics into IT (reference 33). The user may be the 'boss' in terms of button-pressing but their needs often fail to be taken into consideration by systems manufacturers at the design stage and by employers during the implementation stages. It is unsurprising, then, to find resistance to IT in some quarters. However, such resistance should be treated as a postive method of pointing up problems in an organisation, and as an opportunity for reviewing the corporate culture and business strategy. Two general points can be made with regard to resistance.

Since commitment levels will vary according to the end-use of information, staff will be more positively motivated if the information can be shown to be beneficial to them. If they are also involved in the initial design and selection of the system then they will be even better motivated (see Preliminary Report Number 1, British Gas case study).

Anxiety can also result from the re-learning process involved in the implementation of IT. A fear of reduced efficiency and performance may appear during the time that an employee learns how to integrate the new technology with their work. This can be reduced through proper training and by keeping the worker fully informed of events during the implementation of new systems. Resistance to change will usually be reduced as a result.

Nevertheless, such problems prompt the question 'could IT lead to a complete breakdown in trust between the people using it?'. The issue here is one of CONTROL over information. Users consider their control is lost to the computer and, therefore, their trust is lost with it. This situation could be compared to that which existed in the manufacturing industry when craftsmen began to be replaced by automated assembly lines. The loss of control here related to the pace of work, and employees felt that they were being orientated by a machine.

This example could provide a timely reminder for those implementing IT in business. The lessons that have already been learnt in job design should not be forgotten when dealing with the office environment. If appropriate, the project could obtain information concerning job design issues from the Work Research Unit of the Department of Employment.

For the employer, IT can mean the de-centralisation of management itself thus leading to a perceived threat. The threat relates to the additional 'power' which information technology can bring to the individual within an organisation. On the other hand, it has been argued that IT can automate bias and reinforce the inequalities within a business (reference 14). Whichever view is taken, the adoption of IT clearly has serious implications for both employer and employee of a human perspective as well as a technical one.

SECURITY OF INFORMATION (also see Working Paper Number 1)

A recent Women In Management newsletter carried an article directed towards management, discussing the techniques available for 'monitoring' staff; in other words "office bugs" (reference 34). Here is a potential case of microelectronics invading personal privacy. This whole issue of security of information highlights the human aspect of use and abuse of data in a competitive and political environment. "MY WORD IS MY BOND" (Dictum Meum Pactum) no longer applies as a fundamental part of the Stock Exchange. Instead, brokers/dealers operate within a system of Chinese walls, while the Stock Exchange keeps a database of all trading prices on SEAQ for 7 years (reference 16).

Security of information came to the forefront of the business field when the Data Protection Act was introduced on 11th November, 1987. Guidelines have been issued (numbered 1-8) giving full details. With the increase in the collection and dissemination of information through IT, more companies will need to be aware of the implications. As far as 1992 is concerned, no harmonisation regarding copyright exists at present; although a Green Paper was published in June 1988 (reference 9).

A recently reported breach of computer security raises another issue particularly relevant to 1992 and linked to the matter of standardising operating systems (see Stage 1). Robert Morris Junior cultivated a virus which he planted in a version of Unix (Berkeley 4.3) running on a VAX (reference 35). Instructions told the virus how long to wait before duplicating itself, and how many copies were to run on each machine.

Although Morris' virus was not malicious, slowly replicating viruses which are, could easily be developing within computer systems today. As one commentator observed, "One day we will have a crash that makes this episode look like child's play".

As 1992 brings integrated networks and increased systems harmonisation, the potential devastation which such viruses could wreak is enormous.

STAGE 4

MEASURING THE PERFORMANCE VALUES OF PEOPLE AND IT

Perceptions of people-value are unique to the observer but, although it is not possible to impose a standard measure, methods of assessment should be consistent in each case. There is a typical bias against Administrative and Support staff who are often not seen as an investment or as contributing to the future of a business as much as others (reference 36). If they are not doing so, then it is the fault of management in failing to motivate or encourage self-development.

The demand/supply factor unavoidably plays a part in the quantification of staffing values. However, the knowledge-base of an organisation is made up of individuals and its true worth will be lost if one looks at the macroscopic level only. The problem is to measure performance such that it provides an accurate reflection of the business strategy's effectiveness. Heffernan includes: the number of employees leaving and entering annually together with total labour and advertising costs (reference 11). However, human factors have been omitted once again. Perhaps the best way to highlight the value of the missing human factors is to repeat that they constitute a company's ONLY UNIQUE RESOURCE.

Since it is the unique contribution of an individual's skills and experience that will be the determining factor in a company's success, the

following elements are presented for consideration in assessing individual 'people-values':

experience; education and qualifications; professional skills; practical ability and skills (outside of the profession); company knowledge; interpersonal skills (communications); potential for self-development; motivation and loyalty; flexibility of attitude; creativity and innovation; transferrability of skills; trainability.

Transferrability relates to skills acquired in fields unrelated to IT but that could be valuable if applied to it e.g. manual typing, logical problem-solving, effective communication, etc.

Trainability has been discussed at length by, for example, Sylvia Downs, who has monitored tests carried out to assess an individual's potential for training in a particular area. This literature will be reviewed in a later Working Paper. However, trainability tests, if considered appropriate and effective, could be helpful in identifying suitable IT trainees, especially from 'non-traditional' employment markets. Such trainability tests could be given by personnel departments, but also by employment agencies, job centres and other recruiters of IT workers. There would be advantages of such a scheme for both employers and potential employees through helping to narrow any skills gaps that exist and by increasing the pool of available trained IT staff, encouraging individuals to develop and broaden their own skills repertoire.

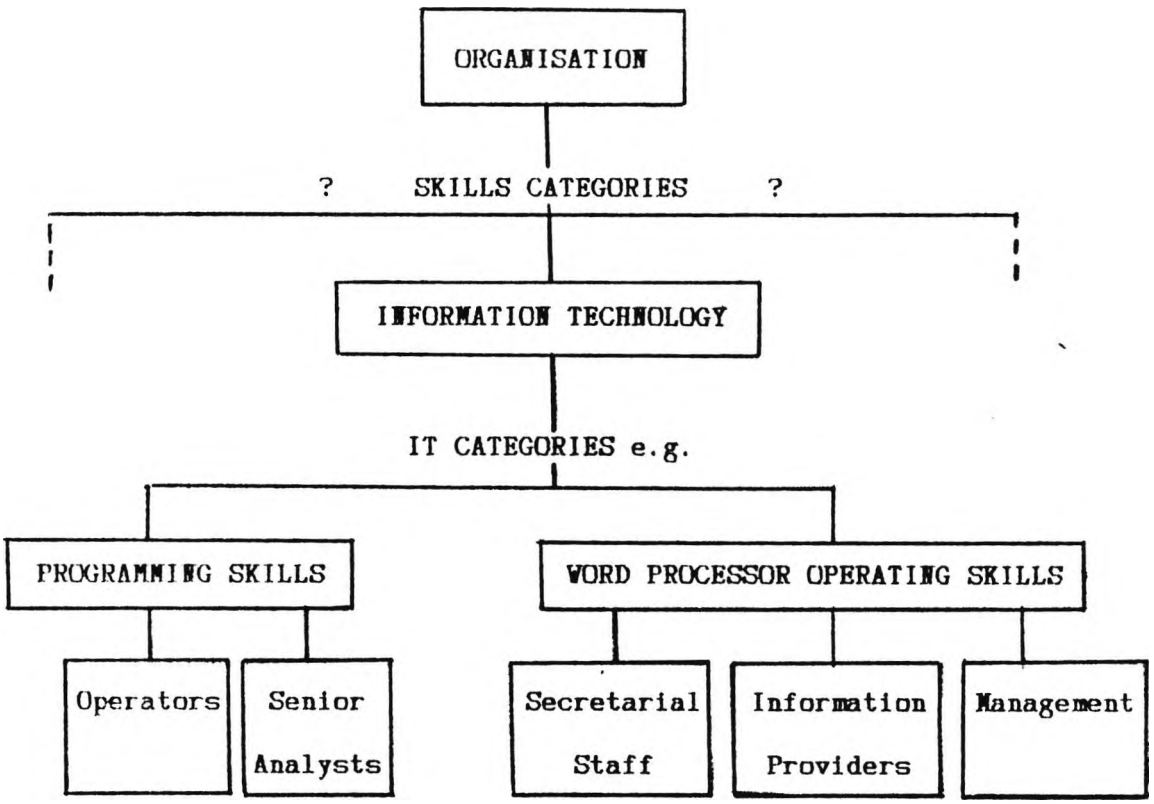
There is a considerable problem in quantifying the value of an IT worker. Yet measuring success in business must include both the human and IT elements. To convert people into a monetary or numerical value is not an entirely plausible aim and the rough guides that can be suggested will probably always under-rate an individual's worth. The City is an excellent example of a knowledge-based business market relying heavily upon human ingenuity, yet who would dare to quantify it?! One issue which the research project could address is the extent to which the introduction of IT in business affects the unique value of the individual employee.

In order to explore this issue, several other points will need to be addressed that are fundamental to the project:

- how does one define the terms 'Information Technology' and 'Information Technology worker'?
- what are the definable parameters of 'IT skills'; for example, do they extend beyond the physical content to include such abilities as good communications?
- to what extent are IT skills different from other categories?
- how can such skills be measured effectively?

In addition, categories which are distinguished within the IT field itself will need to be identified (e.g. programming, word processor operating), together with any variation in the levels at which skills are performed (see Figure 4).

FIGURE 4



Note: Figure 4 indicates how such a study might cross-cut the hierarchical 'tree' diagram of an organisation. However, it may also be relevant to go beyond the internal sphere and, for example, to consider how far the IT skills required of an organisation's clients will impinge on its business strategy.

SUMMARY

The first bibliographic search encompassed a broad range of issues relating to IT skills in the City of London. However, the following points emerged as being of prime importance:

(1) The need for methods of calculating potential skill gaps, allowing for the re-training of existing staff, the transferrability of their skills and an assessment of an individual's potential, perhaps using trainability techniques.

(2) The potential for exploitation of 'non-traditional' employment markets such as: the over-35's, women returners.

(3) An urgent need for a new attitude to training as indicated by point (2). The current skills shortage provides a most timely opportunity for British employers to review their recruitment strategies.

(4) A requirement for managers to continually reassess their aims and methods in order to remain competitive within a European single market.

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APPENDIX 3

Preliminary Report on Research into the Future IT Skill Needs in the City of London

(Working Paper)

CITY University
BUSINESS SCHOOL

PRELIMINARY REPORT ON RESEARCH INTO THE FUTURE IT SKILL NEEDS IN THE CITY OF LONDON

Written by Carole Brooke

CIT Research Scholar

RESEARCH INTO THE FUTURE IT SKILL NEEDS OF THE CITY OF LONDON

WORKING PAPER NUMBER 1

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September, 1988

PRELIMINARY REPORT ON RESEARCH INTO

THE FUTURE IT SKILL NEEDS IN THE CITY OF LONDON

PREPARED BY CAROLE BROOKE

SEPTEMBER, 1988

SUBSEQUENTLY INCORPORATED INTO THE WORKING PAPER SERIES:

RESEARCH INTO THE FUTURE IT SKILL NEEDS OF THE CITY OF LONDON

WORKING PAPER NUMBER 1

CONTENTS

INTRODUCTION

THE BRIEF

The Brief circulated to prospective candidates for the CIT research scholarship included the following key words:

SYSTEMATIC CONTRIBUTION - FIVE TO TEN YEARS - EXISTING/NEW SKILLS

CLASSIFYING - COMPETITIVE ADVANTAGE - BUSINESS STRATEGY

FINANCIAL INSTITUTIONS

In taking these key words as a basis for its direction, this report will consider specific issues relating to IT in business, its impact on individuals and society, and the role of the educationalist.

PARAMETERS

A systematic contribution is effective when standardised such that it can be applied more broadly. Therefore, the recommendations of this report will need to be in a form that can be implemented on a repeated basis. In view of the fact that the time-scale is oriented toward the next 5-10 years, the methodology will also need to be one that can accommodate long-term as well as short-term change and encompass breadth of information as well as depth.

The Company of Information Technologists (CIT) is funding a PhD research studentship for three years within the Centre for Personnel Research and Enterprise Development (C-PRED) at the City University Business School. The person appointed will focus his or her research on "The future IT skill needs in the City of London".

THE CIT is expected to be recognised as a full Livery Company in the near future. It is particularly concerned in promoting educational and training initiatives in IT. The present research is intended to make a systematic contribution to our knowledge relating to future IT skills and training needs of City people. The impact of IT on the success of City activities is enormous, but is partly dependent upon the developers and users of IT seizing the opportunities available to them. The existence of appropriately skilled people in key positions will affect the extent to which these opportunities are converted to competitive advantages.

THE RESEARCH will involve formulating a scenario of the skills and training needs of people who have a role in using and developing IT systems in the City, so that institutions are better able to adapt to and use the changes brought about by IT. The project is oriented toward the next five or ten years rather than the present (e.g. what existing skills will survive? What new skills will surface? How are these skill needs likely to be met?). Problems to be tackled in carrying out the research will almost certainly include: developing a methodology for building a sound scenario, making the link between an institution's business strategy and its IT skills and training needs, developing a framework for classifying IT skill needs.

APPLICANTS should have a good honours degree (or expect to gain one this summer), be familiar with the IT field and/or financial institutions, and be highly motivated to undertake research for a PhD. A qualification which is relevant to the context and/or methods of the research is desirable (e.g. business studies or computing; personnel management or occupational psychology). It is expected that the successful applicant will commence on 1st October 1988.

EXTRACTS FROM THE BRIEF

The stipulated time-scale provides an opportunity to consider the changes which may come about as a result of the forthcoming 1992 European trading regulations.

Essentially, the new legislation will mean that there are no barriers to trade with European countries, e.g. export duty and general 'red tape'. The markets for business will be increased and transport will be much freer. Marketing strategies will need to be aimed at Europe instead of just the UK. This could mean a massive upsurge in staffing levels and correspondent increases in skill needs. Although this suggests an opportunity for greater income from sales and new employment opportunities, similar changes will be occurring in the other countries. As far as IT is concerned, this would mean that the UK would experience greater exposure to levels of technology in the rest of Europe. The UK will have to take this into consideration in converting IT skills to its competitive advantage.

It would seem that 1992 could have far-reaching implications. London is currently the biggest Stock Market and securities centre in Europe, ranking alongside New York and Tokyo. However, 1992 could see the German Exchange in Hamburg competing with London. On a more positive note, however, the EEC already has a united IT programme, called ESPRIT. Hopefully, collaboration and funding for R&D projects will be augmented as a result of these legislative changes.

In addition to the 1992 changes, several other factors may be considered. Demographically, the country is experiencing the downside of a 1960's 'baby boom'. The number of 16-21 year olds entering the employment market has

dropped dramatically and can be expected to continue to do so for some time. The Government has declared its intention for the future to encourage 'mature' education in order to fill skill and knowledge gaps. At the same time, the role of women in society has developed to the extent that over 50% of the UK's female population is employed. Researchers and educationalists alike will need to take account of how such changes in workforce will affect the acceptance, use and development of IT, if at all.

Existing skills should be recorded and compared to those of the past in order to maximise the accuracy of predicting new ones. Questions such as "To what extent have attitudes altered?" will be basic to an understanding of future trends in IT acceptance and development.

Classification at the microscopic level could be taken to mean the labelling of individuals. At this level, classification would not only be potentially unacceptable to those participating in a study but, also unhelpful in illuminating the broad sweep of IT trends in the City. At a macroscopic level, however, the major areas of IT skill needs could be identified, increasing awareness of current and future training needs and encouraging a favourable public response towards meeting them.

Identifying the competitive advantages achievable through IT in relation to other countries (with respect to the GNP), and in relation to other companies (with respect to internal competition), raises several interesting points. The conversion of resources into wealth through maximum exploitation of IT is a multi-layer process. From designer downwards there is much leeway for misunderstanding and a breakdown in

communications. Designers may find their technology unpopular or unwelcome, and employees may find themselves out of touch or out of work. This highlights the need for educationalists at the place of work, together with those of a more peripatetic and academically-based nature, and their role will be discussed later in the report.

SOURCES OF INFORMATION

This report draws upon the bibliography, personal experiences in the field of business and IT, and information obtained from personal communication with individuals.

PERCEPTIONS OF IT

BUSINESS STRATEGIES

To utilise some key words from the Brief, a business's aim could be summed up as being the conversion of opportunity into competitive advantage. The business in question may be primarily a producer of IT or a consumer. With respect to the City, and in particular financial institutions, the latter is generally the case.

In order to 'compete', a business has to be aware of its competitors' strengths and weaknesses, its potential market, and what can be done in order to achieve maximum return. The most immediate concerns, then, are the begin and end positions of 'Where are we today?' and 'Where would we like to be tomorrow?'. Often, an upgrade in IT can augment performance. However, where this involves the streamlining of employee numbers, or the retraining or redeployment of staff, to what extent can a business expect to anticipate and prepare for change? Furthermore, how can it keep disruption to a minimum and resource-use to a maximum?

The aim of the business strategy is to present a coherent, ordered and successful development through time to its competitors and its public. But what of the face it presents to its employees? To what extent do company and employee interests conflict and to what extent can this be prevented?

THE EMPLOYEE

During times of change, the 'human' face of IT may present a very different picture to that of the business strategy. Employees may become confused, demotivated, insecure or even redundant. On the basis that success occurs when preparation meets opportunity, educationalists need to spread the message that, for both sides of the equation, planning and forethought pay dividends.

For the employee, the considerations are not so very different from those of the business strategy. 'Where am I today and where would I like to be tomorrow?' are basic starting points in any self-development/evaluation exercise. Furthermore, one needs to be aware of the competition - i.e. other employees.

Nevertheless, individuals (unlike institutions) are bad at recognising their strengths! They also tend to lack confidence. Many people are afraid to volunteer themselves for retraining either because their fear of failure outweighs their desire to develop, or because of mis-information received about the nature and purpose of IT. In the eyes of the employee, IT could more often appear as an adversary than as an aid.

It is a cliché that older generations resist change and development whilst younger ones accept them willingly and with a sense of adventure. Ironically, with the current demographic change in age distribution, it will be an older generation that is specifically targetted to meet future IT needs. One aim for educationalists should be to help break down these

age-related mind-sets. Individuals cannot be forced into acceptance of IT, only educated into it.

THE END-USER

End-users, as referred to for the purposes of this report, can be distinguished from employees as 'consumer members of the public'. Perceptions of IT amongst end-users will obviously vary but, some interesting comments have been made recently. Jean Gimpel is of the opinion that Western civilization is experiencing the downside of the second industrial revolution and that technical initiative and economic activity is drifting towards the Pacific Basin (reference 7). With an upsurge in demand for 'traditional' products - e.g. health foods, Victoriana, handicrafts - one could be excused for thinking that advanced technology is taking more of a back seat in the UK. Whilst there are (and may always be) anti-technological forces at work in society, it would be rash to overemphasise such trends. What revivals there have been are largely confined to 'fashion' fields of dress, food and interior design.

In today's consumer society, the demand for advanced technology in such areas as automobiles, domestic equipment and the working environment is, perhaps, even greater than before. Over the last 10 years, for example, the number of homes with personal computers has rocketed. It could be argued that, as a result of this increase in IT awareness amongst end-users, the importance to the business sector of IT exploitation as a means of demonstrating a competitive advantage, has been considerably heightened.

Consequently, IT is no longer privileged knowledge. Whilst this is a desirable situation in terms of education, the paradox exists that whilst end-user skills and knowledge develop, large sections of society and employees are left ignorant or indifferent towards the benefits that IT can bring.

Mention can be made here of legislation relating to end-users, including the Data Protection Act and issues relating to privacy of information.

Patents exist to protect certain types of technology but do not usually extend to the information which they utilise. Legislation has now been introduced to protect the rights of the individual and corporations in knowing who holds what information. Another facet of this problem is the protection from competitors and hackers (unwanted "end-users") of information contained in a system. Hacking has become a full-time activity and the implications are serious. As the operation of political and financial affairs becomes increasingly sophisticated, so its vulnerability to corruption by such people becomes a major cause for concern.

CASE STUDIES

BRITISH GAS

During the period 1981-1984, British Gas introduced wordprocessing to its support staff, a time when developments in the field of office technology were rapid. Employee fears concerning their replacement by machines were counterbalanced by hopes that office overloads would be relieved. Employers expected instant answers to their problems and a virtual doubling in work output.

It came as no surprise, then, that the technology met with a divided response. On the one hand, disillusionment set in as staff realised their short-term hopes had been unrealistic. Whilst staff wrestled with the problems that usually accompany implementation of a new system, management continued to believe that previously lengthy jobs could now be executed at the 'press of a button'. The overall lack of information and training given to both management and support staff alike led to frustration and a breakdown in communications.

In order to make best possible use of human and financial resources, attention could have been given to the following points:

- assessment of the IT needs of the employer,
- communication of these needs to the employees,

- discussion on how the needs could be met effectively,
- provision for readjustments according to existing staff levels and make-up of the workforce,
- forward planning to maximise the time available for induction and training,
- anticipation of further developments and their impact on the working environment,
- continuous monitoring of progress by the employer and, where possible, an educationalist.

If a programme like this had been implemented at British Gas, problems could have been kept to a minimum.

THE FIELD OF FINANCE

The field of finance is appropriate for the study of IT trends for several reasons. Financial information is produced from, and expressed in terms of, numbers, whilst IT developed out of its number-crunching capabilities. Advances in the field of finance are also more easily quantified (visually and monetarily) than, for example, in the field of graphics. With the City as the heart of wealth creation in the UK, it seems logical that plans for research should be focussed there.

When talking of City finance, most people probably think of the stock market. IT has already had an enormous impact there. October 1986 saw the Big Bang when legislative changes resulted in the Stock Exchange becoming

computerised. The floor of the Exchange no longer buzzes with jobbers. Only the jobs of stockbrokers remain.

More recently, Black Monday sent shock waves throughout the City. America's budget deficit (money spent exceeding taxes received) sent the dollar crashing and pushed up interest rates. Although IT was not responsible for triggering this event, it did have an affect on it. Many brokers had programmed their terminals to sell shares once they had reached a certain price. When the crash happened, the computers went into action. However, as a result of the extent of the fall in prices, the computer activity triggered a downward spiral. The more computers sold their shares, the lower the prices fell, and so on. What began as a minor panic, ended as a major one!

Thatcher's Government policies have resulted in a vast increase in the number of people who have a direct interest in the stock market, even though they may only have a very modest investment. Evidence of this increase in public investment is seen in the media. The Daily Telegraph Teleshare Service provides an information network, whereby electronic signals are converted into speech, giving share prices to the nearest second, together with portfolio details as requested. The service is available 24 hours a day, 7 days a week and is a simple telephone-based system (see illustrations).

Stockbrokers could be forgiven for feeling slightly insecure following the events of Black Monday. Some brokers fear that IT developments, along such lines as the Teleshare service, will eventually push them out of a job.

Financial information at your fingertips

If you have any investments quoted on The Stock Exchange there's a remarkable new service that helps you keep track of how those investments are performing on a second - by - second basis – *The Daily Telegraph Teleshare Service* – from the comfort of your own telephone. The service also offers a wide range of financial bulletins, regularly up-dated throughout the day.

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One broker commented that the increase in facilities which enable a client to dial direct in order to process deals could, over a period of ten years or so, result in the disappearance of all 'middle men and women'. The question is, is this a realistic fear?.

The people-replacing aspects of IT are often over-exaggerated and the tendency is to overstate its negative side at the expense of the positive. Despite a common belief that secretarial and support staff will become redundant as a result of office technology, anyone who reads the employment advertisements, or glances at a recruitment agency window, will see that secretaries today enjoy as much demand and remuneration as previously. This is partly due to the need for support staff who have IT skills, and partly because the desire for human advice and service persists. People still prefer to talk to people rather than machines that sound like people.

The field of finance is a complex one. Financial institutions, including Banks, Insurance Companies and Building Societies, do not file their information in the same way. IT has, therefore, to tackle this problem. In addition to this, the range of services which they offer has recently increased, partly as a result of changes in legislation.

Banks and Building Societies now provide pension plans as well as savings schemes, whilst insurance companies provide investment through managed funds. IT can have a role in helping to elucidate who is providing what service as well as who is merging with who. A financial institutions database (FIND) is currently undergoing development at Pergamon Orbit

Infoline and is designed to provide such information for the public and business competitors alike.

Meanwhile, a company called TEKRON have launched a series of Databases of Financial Information (see illustrations). Their Building Societies database was produced partly in response to the expansion of Building Societies into international money markets following the changes in the law governing their activities. TEKRON's European Database will be particularly relevant when the 1992 changes come about. Standardising the presentation of financial information provided by European member states will be a useful contribution. It seems that database development in general will be a growth industry.

A brief survey of database literature reveals that media laydowns often revolve around making institutions more competitive (see illustrations). However, a second selling point is becoming clear: that of simplicity of operation together with user-support services. This relates back to the need for education in IT use (see illustrations). Whereas it was once boastful to emphasise the complexity of a system, the trend has now reversed. "User-friendly" has been introduced into the English language.

Moving away from databases *per se*, on the more general front of IT, the field is wide open for those who can provide advice to institutions. The stage is, thus, prepared for the educationalist to play an important role.

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ORBIT Search Service, a division of Pergamon ORBIT InfoLine, is an online information retrieval service. ORBIT makes the world's key scientific, technical, and patent information . . . the information that is so essential for patent attorneys, researchers, scientists, and engineers . . . easy to access, easy to retrieve, easy to use. ORBIT specializes in information for:

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In today's highly competitive world, can you afford to be missing crucial information? Can you afford the time and resources required to manually search thousands of documents and records?

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"COMPETITIVE ADVANTAGE" IS A MAJOR SELLING POINT OF THIS DATABASE

Newsletter subscribers receive:

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How the Newsletter is produced

A small group of journalists work on press releases and follow up leads from news stories in newspapers and financial journals. Their output is in the form of newsbriefs which are entered into the financial news database.

Before a news item is loaded into the database the name of the company or society concerned is entered and all newsbriefs relating to the company or society are displayed on the screen. The journalist can then improve the latest newsbrief based upon the knowledge of earlier news. If the news item has financial facts which need to be verified then the journalist has fast access to the accounts and analysis of societies, banks and insurance companies.

All news items pass through an editorial control before they are loaded into the database. At this point, the editor of the Newsletter will identify the important newsbriefs which may become part of the editor's commentary and/or a key fact sheet.

The Newsletter is produced every second Monday with a new cumulativ index and posted first class to subscribers on Tuesday morning.

BUILDING SOCIETIES DATABASE containing the accounts and general information of UK building societies from 1981/82 to date. Details of the subsidiary companies of building societies will be loaded as they become available. Searches may be made for details of an individual society or comparisons between societies. A product and services file is being developed for each society on the database.

INSURANCE COMPANIES DATABASE containing the accounts, general information and returns to the Department of Trade & Industry from 1981/82 to date. Searches may be made for details of an individual insurer or comparisons between insurers. A product and services file is being developed for each insurer on the database.

REGISTERED BANKS DATABASE containing the accounts and general information of UK registered banks from 1982/83 to date. Database is currently being revised into the proposed EEC format for bank accounting. Searches may be made for details of an individual bank or comparisons between banks. A product and services file is being developed for each bank on the database.

FINANCIAL NEWS DATABASE containing financial news relating to UK based financial institutions, their products, services, plans, financial and marketing information. Searches may be made on key words to produce a news history on a specified institution or a news analysis of a subject such as pensions, computers or unit trusts. The database also produces fortnightly specialised newsletters for banks, insurance companies and building societies.

FINANCIAL ADVERTISING DATABASE containing details of display advertising in the UK national press and financial journals relating to finance and financial institutions. The database is fully relational and allows a wide range of searches to be made. For example the advertising expenditure of a bank may be listed showing how much it has spent, when and where it was spent and what categories of advertisements were placed. Or a listing could be produced showing the largest advertisers for pensions or unit trusts over a specified time period.

- - - - - - - - - TEKRON EUROPEAN DATABASE - - - - - - - - -

The European Database is the largest project ever undertaken by the Group and will require ACTIVE partners in each member state and substantial investment.

DATABASE OUTLINE

The database will concentrate on financial institutions which are registered in member states and are legally required to produce accounts for public records within those states.

Data collection and analysis in each member state will be done on the same principles as the tried and tested methods used by Tekron. From the outset, every attempt will be made to narrow the differences in accounting treatment and move towards a common European method of presentation. This will require two kinds of database to be constructed which will be referred to as "host state files" and "European files".

Host state files will be constructed in the host member state language and use presentation techniques which are appropriate for that member state. The planning of these files must be done with a view to the needs of the European file structure.

The European file structure is being developed by Tekron and will draw its data from member state host files. This will be done by ensuring that host state files are constructed and loaded using software developed in conjunction with Tekron and hardware is used which is compatible with Tekron so that all regular data transfers are progam runs and no data is keyed more than once. The language of the European file will be English and the common currecy will be the ecu.

THE TEKRON DATABASES

Special Support Services

BRS offers a wide variety of support service including:

- **Telephone Customer Service** — Our toll-free number 800-345-4BRS (800-345-4277) puts you in touch with BRS Customer Service representatives who have the training and expertise to respond to your questions.
- **User Education and Training** — BRS sponsors training sessions throughout the U.S. and Canada geared towards beginning, experienced and specialized users. For more information call toll free 800-345-4BRS (800-345-4277).
- **Bulletin** — The BRS BULLETIN keeps subscribers updated on new databases, developments and features. Searching tips and training schedules are included in each issue.
- **Documentation** — The BRS/SEARCH Service User's Manual illustrates the features of the search system comprehensively in one volume. Brief one-page summaries for each database are available. Detailed guides are also available for each database.

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PFDS runs a series of inexpensive training courses designed for every level of experience and subject interest. In addition we are always happy to run 'in-house' training courses designed to meet the exact requirements of your organisation.

Detailed, yet easy to understand guides are published for each database and for the PFDS command language. These are available for purchase, either individually or as part of the BUSINESS section of manuals. We also publish a bi-monthly newsletter, UPDATE, to keep you up to date with news of databases and software features.

If you need help or advice when using the service, our Help Desk is manned throughout the working day and we are always happy to be of assistance, telephone 01-993 7333.

Getting Started

All you need is a PFDS password (which we will supply free of charge), a terminal or micro-computer with suitable communications software and a modem or acoustic coupler. You will then be able to see for yourself just how useful PFDS will be to you.

As a new customer we shall give you some free time to allow you to become really familiar with the system. You will also receive your own confidential password and a free brief guide to using PFDS.

The password is free, but there are charges for using PFDS databases. Once you have used your initial free time, you will be charged for the time you use on the system and for the data you take from it. These prices vary from database to database, but typically work out at £1 per minute. A typical search takes less than 10 minutes to complete!

To obtain your password simply sign and return a copy of the PFDS Service Order Form and we shall send you confirmation of your confidential Username along with details of how to use the system.

Pergamon Financial Data Services

Pergamon Orbit InfoLine Ltd
Achilles House
Western Avenue
London W3 0UA
Tel: 01-992 3456
Telex: 8814614

Pergamon Orbit InfoLine Inc
8000 Westpark Drive
McLean
Virginia 22101
USA
Tel: (800) 421 7229

USER SUPPORT AND EDUCATION IS INCREASINGLY PART OF
'FIRST LINE SELL' IN THE BUSINESS FIELD

DEVELOPING A FRAMEWORK

THE ROLE OF THE EDUCATIONALIST

There are several different types of educationalist. Most larger institutions have their own in-house specialists attached to the Personnel Division. They are responsible for the training and welfare of staff implementing new systems.

As seen in the British Gas example, a badly managed transition can have damaging consequences. The aim of the in-house educationalist should be to make the changeover as smooth and satisfying as possible. These consultants have a unique advantage in knowing the company and its staff well. At best, they can provide an accessible on-site advisory service. At worst, they can appear indifferent and alienate staff.

A second type is the education consultancy. It seems reasonable to expect a future trend toward the development of such services in the UK, particularly amongst management consultants and institutions that provide financial services. An example is Arthur Andersen and Company, who not only provide a consultancy service to others but, also produce educational literature. "Trends in Information Technology: 1986" was directed toward executives who needed to learn about the latest developments in office IT in a fast and easily-digestible form.

Preface

One of the most significant issues facing management through the end of this decade is how to exploit information technology effectively. By using technology innovatively to create new products, capture new markets and reduce costs, companies are improving the effectiveness of their workforce and enhancing their competitive position. Organizations as diverse as banks, airlines and consumer goods distributors have gained sustained, significant and uncontested competitive advantages through the use of information technology. The impact on their respective industries has been dramatic. They established such a lead that their competitors were forced to join them. Those competitors who had kept pace with technology and who had responsive systems development groups were able to mount a timely challenge. Those who had been less diligent in attending to their information systems found themselves struggling to catch up.

FROM ARTHUR ANDERSEN & CO "TRENDS IN INFORMATION TECHNOLOGY: 1986"

An education consultant is hired by a company to assess, design, implement and monitor custom-made office systems (most frequently computerised). These educationalists have the disadvantage of having to familiarise themselves with the company set-up and manpower beforehand in order to complete a project effectively. There is also the risk of resentment by staff toward an outsider appearing to initiate change. Another potential problem with education consultancies is the mistrust that can arise from the belief that, having been paid for a job, they can turn their back on the company if the project ultimately fails.

Nevertheless, there are several ways in which being an outsider can prove to be an advantage. Firstly, the ability to stand outside of the situation can add a more objective dimension to the work study. Secondly, consultants generally operate to a tight deadline, ensuring that implementation is achieved in the shortest possible time-span. Also, staff may feel more open to discuss their grievances and problems with a third-party than with members of their own organisation. Finally, both education consultant and employing company alike have a greater commitment to make a project work, if only by virtue of the costs involved. The follow-up by an education consultant (equivalent to the 'after-sales service' of a database company) is more likely to be conducted effectively as part of a contract than, perhaps, as part of an in-house programme.

The final group for discussion here is the academic educationalists. This includes full-time academics employed in the research side of IT, together with advisors to the field of business. It could be argued that, of all three groups, this is the most objective in terms of assessing the future

skills and needs of UK businesses. As they are not subject to the hiring and firing of any one particular business, academic specialists can advise on the advantages and disadvantages to both employer and employee alike, making recommendations as appropriate. The research side of IT will always play a crucial role in the development of business for, as Pope said:

"Be not the first by whom the new are tried,
Nor yet the last to lay the old aside."

OBTAINING FEEDBACK

In order to provide a systematic contribution to research into future IT skill needs, a standard procedure should be drawn up to obtain feedback from the City, as well as from end-users (a potential market for the purposes of charting perceptions of IT in business).

In so far as classifications have already been adopted in this report, they relate to the division between employer, employee and end-user. However, the fourth dimension to be added here is that of the innovators, the people who design, build and introduce IT in business; such as the database companies.

Flow charts could be constructed to illustrate the processes involved in obtaining and monitoring feedback from each of these four main areas and for comparing their relative needs and responses.

RECOMMENDATIONS

1. Utilise currently available sources in order to identify existing skills and needs, for example:

   - databases such as the National Computer Index (see illustrations),
   - literature such as the Computer News Recruitment Handbook (see illustrations).

2. Prepare documentation for a survey to be conducted of City skills and needs to be conducted every two years, for a period of 10 years. This period to be followed by a review of the procedure itself.**

3. Target certain sectors of the City, with respect to both employers and employees, with the survey covering skills, needs and perceptions of IT.

4. Explore the education statistics: who is in education and what subjects are they studying?

5. Prepare a record of where the gaps lie and what will be needed to fill them, capitalising on such resources as the 'mature' market for education and the unemployed.

6. Issue a report at two-yearly intervals for presentation to the Government and the business sector. It is to be hoped that this will attract funding for research as well as reaching the eyes of both employers and employees.

7. Encourage input from members of the public and makes copies of the report available to them through public libraries, educational establishments and bookshops.

8. Liaise with the Manpower Services Commission in order to enhance employment information and attract funds.

** Note: Consistency in approach over an extended period of time is important in order to enable comparison of results.

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10. TEKRON Publications Ltd, general publicity material, 1988

KEY BRITISH ENTERPRISES FILE KBE

Specialists at Dun & Bradstreet have compiled this unique directory which provides essential information on 20,000 major British companies, which account for 90% of industrial expenditure in the UK. The KBE database is ideal for sales, purchasing and many other marketing requirements. Using KBE you can efficiently pinpoint and check specific company details such as address, directorships or trade names; or you can target types of companies by searching on business activity, overseas markets, number of employees or turnover.

Uses:
Generating mailing lists
Creating company profiles
Marketing projects

SCOPE OF COVERAGE:

File size: 20,000
Coverage: Current
Updating Monthly
Database owner: Dun and Bradstreet
26-32 Clifton Street
London EC2P 2LY
Tel: 01-377 4377
Telex: 886697

NATIONAL COMPUTER INDEX FILE NCI

The National Computer Index is a market intelligence database which identifies the use made of hardware, software and peripherals in 20,000 company sites in the UK. The database is updated monthly on a rolling programme so that each company is surveyed every year.

Using NCI you can target by a wide variety of criteria so that you can present the information in the most useful way. You can, for example, target by geographic location, DP budget, machine type or programming language.

Uses:
Identifying new sales prospects
Market research projects
Company profiles

SCOPE OF COVERAGE:

File size 10,000 sites
Coverage: Current
Updating Monthly
Database owner:: National Computing Centre
Oxford Road
Manchester M1 7ED
Tel: (061) 228 6333
Telex: 668962

Data Training Ltd

THE COMPANY

Data Training is an all British company, fulfilling an important national role by producing more computing professionals, equipping them and their installations to be more productive while contributing to improved standards of training and technique across our industry.

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THE ENVIRONMENT

Analysts and Programmers undertake extensive practical work within courses, to become effective for their installations immediately on completion of training.

Consultancy Support, before and after training, helps installations to plan and manage implementation of new advances in technology and techniques. Scheduled courses and Consultancy Support are provided from our specially equipped centre in London. Custom-built training can be developed for specific needs and delivered at client sites or at our own venue.

KEY FACTS

The company owes much of its success to the commitment and expertise of the Lecturers and Consultants, all experienced computing professionals who combine high levels of practical skills with the ability to impart their knowledge to others. Their experience has been gained in developing and implementing major systems over a breadth of applications, industries and computing environments.

We do not expect to recruit experienced instructors, you will be helped and guided in the techniques of teaching, and the continuing growth of your technical knowledge and skill is our responsibility. At Data Training, we share a common spirit leading other people to success is genuinely important to all of us. There is a bond between colleagues, and to the company, which derives from our consistence on fair opportunity and reward. Rest assured each new person is trained as only we know how, developing communication skills and sharpening knowledge of advanced methods.

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Because much of our success is reliant entirely upon you, the Data Training professional, we operate profit sharing schemes both monthly and annually.

All our people are given the free membership of a private health care programme, covering both you and your family. We also operate a non-contributory Pension Plan.

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CONTACT

Linda Thorpe, Resources Manager, Data Training Limited,
7/9 Norwich Street, Holborn, London EC4 1EJ. Telephone: 01-404-5444

(NB: Will be relocating in January 1989 within the London area)

APPENDIX 4

The Company of Information Technologists Postgraduate Research Scholarship

CITY University
BUSINESS SCHOOL

Frobisher Crescent
Barbican Centre
London EC2Y 8HB

Telephone 01-920 0111
Telex 263896
Fax 01-588 2756

THE COMPANY OF INFORMATION TECHNOLOGISTS
POSTGRADUATE RESEARCH SCHOLARSHIP

The Company of Information Technologists (CIT) is funding a PhD research studentship for three years within the Centre for Personnel Research and Enterprise Development (C-PRED) at the City University Business School. The person appointed will focus his or her research on "The future IT skill needs in the City of London".

THE CIT is expected to be recognised as a full Livery Company in the near future. It is particularly concerned in promoting educational and training initiatives in IT. The present research is intended to make a systematic contribution to our knowledge relating to future IT skills and training needs of City people. The impact of IT on the success of City activities is enormous, but is partly dependent upon the developers and users of IT seizing the opportunities available to them. The existence of appropriately skilled people in key positions will affect the extent to which these opportunities are converted to competitive advantages.

THE RESEARCH will involve formulating a scenario of the skills and training needs of people who have a role in using and developing IT systems in the City, so that institutions are better able to adapt to and use the changes brought about by IT. The project is oriented toward the next five or ten years rather than the present (e.g. what existing skills will survive? What new skills will surface? How are these skill needs likely to be met?). Problems to be tackled in carrying out the research will almost certainly include: developing a methodology for building a sound scenario, making the link between an institution's business strategy and its IT skills and training needs, developing a framework for classifying IT skill needs.

THE CITY UNIVERSITY BUSINESS SCHOOL is one of the leading schools in Europe, and the University as a whole has many courses and research projects in the IT field. The Business School has recently appointed Clive Holtham to its new Honeywell Bull Chair in Information Management. C-PRED has conducted over 50 research projects since it was established in 1978, and has expertise in the basic research skills required for the present project.

A STEERING GROUP has been formed to oversee the research. Current members are: Mr. Alan Benjamin (Director of Communications, CAP), Sir Peter Miller (Former Chairman, Lloyd's of London), Mr. David Fairbairn (Managing Director, James Martin Associates), Professor Andrew Chambers (Dean of the Business School), Professor Allan Williams (Director, C-PRED). Discussions are in progress with a number of financial institutions to augment the funds available for the research, and to make it possible to recruit a second PhD student and a senior research fellow. Any new sponsor will also be expected to second an executive on a part-time basis to the project. The project is being led by Professor Allan Williams.

FUNDS currently available will allow the CIT Scholar to receive at least £3,700 per annum plus Home/EC tuition fees. As part of his or her research training, the scholar may be involved in other approved research projects (not more than 6 hours in any one week). If these are externally financed, appropriate financial rewards will be given.

APPLICANTS should have a good honours degree (or expect to gain one this summer), be familiar with the IT field and/or financial institutions, and be highly motivated to undertake research for a PhD. A qualification which is relevant to the context and/or methods of the research is desirable (e.g. business studies or computing; personnel management or occupational psychology). It is expected that the successful applicant will commence on 1st October 1988.

Those interested in being considered for the CIT Scholarship should return a completed application form by 8 July 1988 to:
Anne Stewart, City University Business School, Frobisher Crescent, Barbican Centre, London. EC2Y 8HB

APPENDIX 5

IT Skills Project Information Sheet

CENTRE FOR PERSONNEL RESEARCH
AND ENTERPRISE DEVELOPMENT

CITY University
BUSINESS SCHOOL

Northampton Square
London EC1V 0HB

Telephone 071-253 4399
Fax 071-250 0837

FUTURE IT SKILL NEEDS IN CITY ORIENTED ORGANISATIONS

SPONSORS

PERIOD OF RESEARCH

Initially funded from 10/88 to 9/91

BACKGROUND

The project was instigated by the Company of Information Technologists financing a scholarship for a Ph.D student to research into future IT skill needs in the City of London. The sponsorship base was subsequently widened in order to increase the resources available, to ensure that the research was influenced by organisations having to plan for future IT skill needs, and to reduce the time lag between the findings of the research being available and their use by organisations. Two mechanisms have been introduced to help achieve these aims. Firstly, in addition to financial support, each sponsoring organisation is seconding up to a quarter of the time of a member of staff to the research team. Secondly, a steering committee which includes senior executives of the sponsoring organisations and the Business School has been established.

AIMS

The impact of IT on City oriented organisations has been enormous. It is also true that organisations able to harness the full potential of IT in developing and implementing their business strategies will have competitive edge for survival. Ultimately, this capability depends on people having the appropriate skills, not only the technical specialists, but also the managers who have the power to influence the use of IT. What existing or new IT skills will people need to have in the future?

How do these skill needs differ according to the roles which people occupy in the organisations? Are there any marked differences and similarities between skill needs found, for instance, between banks and insurance companies? What are the implications of the answers to these questions for the recruitment, selection, training and deployment of staff? These are some of the questions to which this research is addressed.

The research programme's statement of objective may be summarised as:

> "Identifying future IT skill needs with a view to enhancing the competitiveness of City oriented organisations. The research will help to ensure that organisations are geared to make the most effective use of human resources and IT in implementing their business plans."

METHODS

Action research is an appropriate description for the general approach being used, given the aims and the active participation of the sponsoring organisations in the research process. The research has now been underway for about eighteen months. During the first year a number of activities occurred, namely:

* a literature search, using appropriate data bases and consulting individuals in relevant networks. The culmination of this work over the three years will result in the production of a computerised bibliography.

* a review of models/frameworks used to classify IT roles, skills and competences.

* a review of definitions of IT and IT 'workers'.

* fieldwork within the sponsoring organisations aimed at identifying:

  (a) the existing roles in which IT skills are required for effective performance

  (b) anticipated changes to these roles

  (c) new roles likely to emerge.

In this second year we are involved in four major activities. The first, a Delphi study, aims to identify the uptake of advanced information technology within the financial services sector at three time points 1990, 1995 and 2000. The Delphi questionnaire was designed as a result of a literature survey and a questionnaire survey of technical experts. The Delphi panel comprises around sixty senior persons, with knowledge of the

application of IT. The panelists come from a range of leading organisations in the banking, building societies and insurance industries and from consultancy, journalism, academia and interest groups. It is envisaged that there will be three rounds and emphasis is being placed on both qualitative information and quantitative predictions.

Secondly, an interview survey is being conducted of people from a range of institutions including regulatory organisations, professional organisations, trade associations and firms within the financial services sector to obtain views on important trends/developments and changes, likely to occur over the next five to ten years, which will influence the industry and business strategy.

Towards the end of 1990, information from these two sources will be used to build a range of likely sector scenarios.

It is then intended to examine these scenarios to determine (a) their implications for company strategies, and the resulting IT function, and (b) key IT roles and skills and recruitment issues, given our knowledge of the demographic and market characteristics of the 90's. This will be developed further during 1991.

In the fourth activity, a member of the team is conducting in-depth fieldwork within two of the sponsoring organisations focussing on the impact that IT developments will have on the role of the analyst/programmer. Central to this part of the project is the development of a research methodology which will identify issues relating to the recruitment, development and retention of technical staff in the context of the demographic downturn, shortage of experienced staff and the increasing emphasis on IT as a means of maintaining a competitive edge in business.

RESEARCHERS

From the Business School:

Professor Allan Williams (Director of Research) 01-920-0111
Carole Brooke (CIT Research Scholar)

Sally Woodward (Research Fellow) 01-253-4399
Richard Reynolds (Research Scholar)

From the sponsoring organisations:

July 1990

APPENDIX 6

Sponsor A: The First Research Proposal

PILOT STUDY : PROPOSAL

BACKGROUND

The attached information sheet explains the origins and nature of the IT Skill Needs project for which are one of the sponsors. The CIT Research Scholar's PhD forms one component of the overall research and the pilot study will form an important basis for the completion of the PhD.

AIMS AND OBJECTIVES

The pilot aims to test out the methodology intended for use in the PhD. The objectives of the pilot are the same as those of the overall IT Skill Needs project, outlined in the sheet, except that the benefits from the pilot work will accrue only to in the first instance (see Results below).

The specialist IT group of analysts, programmers, and analyst/programmers has been identified by , as well as other organisations in general, as being of key importance to the future of business. The PhD and, hence the pilot, will focus on this issue and assess the likely changes with respect to these roles. Another specific objective will be to produce findings that will aid in planning, recruitment, training and deployment of staff over the next five years or so. In-depth job analyses will not be conducted but research will focus on the profiles of individuals.

The time-scale of the full PhD is three years, from October 1988 to September 1991. Most of 1990 will be dedicated to collecting as much data as possible and analysing it in preparation for the final stages of writing up. Since the pilot will only form part of this data-collection exercise, it is recommended that a maximum of 2 months (8 weeks) be set aside for its completion, to commence as quickly as possible.

Since the research aims to look to the future, it would be favourable to focus on an area of work for which there is a minimum of 5 years' history, and for the technology and methods in use to be fairly up-to-date.

METHODS, RESOURCES, ETC.

The research will be conducted by the CIT Research Scholar. A maximum number of 30 staff is considered to be a manageable size for study. Whilst all levels of staff may be involved at some point, the minimum of disruption to work will be caused, since the nature of the study is more observational than participatory.

The Research Scholar's data collection methods will be varied, including an analysis of any available literature and organisational records, together with consultation of staff. Any discussion time will be agreed beforehand with the appropriate superiors. It may also be desirable to consult individuals who are no longer involved in the work of the area under study.

All communications will be strictly confidential to the researcher and the individuals concerned.

RESULTS

The overall project, of which the PhD is a part, has adopted an Action Research approach. This means that during the pilot, information will be fed back to at regular intervals (and to no other organisation). The pilot will also be formally written up and a copy of this report passed to . The results of the pilot will not be disclosed to anyone except the University staff team members. Wider disclosure/publication will be undertaken subject to the appropriate confidentiality criteria.

It is very much hoped that the pilot research can commence as soon as possible so that the objectives of the project can begin to take shape and the work of the CIT Research Scholar moved forward in line with the deadlines set by the University, Steering Committee, and sponsors.

CAROLE BROOKE
CIT RESEARCH SCHOLAR
1.1.90

APPENDIX 7

Sponsor A: The Second Research Proposal

PILOT STUDY : PROPOSAL 2

This proposal is divided into three main sections: Ouput of the study, Resources required to conduct the study, and an Appendix which outlines the areas to be covered when talking to staff.

OUTPUT

The pilot study will contribute to the overall IT Skill Needs project at a number of levels. It is an important first step which will have a 'domino effect' in terms of output. This is illustrated below.

LEVEL 1. REPORT

As mentioned in the first proposal, a report of the research will be produced for once the research is complete (in addition to the continuous feedback provided by Action Research).

The report will take the form of an account of the research process itself (what has been done and who has been seen), followed by the findings of the study. These findings will be at both specific and general levels and may take the form of the examples given below:

Findings specific to the project

* technological distribution
* future skills

Findings general to

* observations relating to skills issues
* take-up of technology within the

LEVEL 2. PHD THESIS

The pilot will form the basis for the rest of the PhD thesis and will be a testing ground for the research methodology itself. Until the pilot has been completed, progress on the PhD will be limited.

LEVEL 3. MILESTONE REPORT

This report is to be produced in October 1990 for presentation to the Steering Committee of the project. Two of the major features of the report will be the pilot study and the Delphi study.

LEVEL 4. OVERALL IT SKILLS PROJECT - MAJOR REPORT

The PhD thesis will form an important part of the major report which is to be produced in September 1991 (i.e. at the close of the CIT bursary).

RESOURCES

The total time span of the pilot will be 8 weeks.

The first 4 weeks will be spent gathering information on-site at
The second 4 weeks will be spent analysing it off-site.

Breakdown of the 4 weeks spent on-site

WEEK 1:

The Project Manager may wish to discuss the study with the researcher before the work commences. A maximum of two hours of the Manager's time would be sufficient to provide a good two-way exchange of information. The Manager will be kept informed of progress made, thereafter, as often as requested.

During the first week on-site, the researcher will be able to get a 'feel' for the way in which the project team is organised: seating arrangements, office plans, communication lines, etc. It will also provide an opportunity for the staff to get used to a non-team member being present.

It will be necessary for the researcher to draw up an 'organagram' of how the project team fits into the rest of the IT Group and the itself, together with the main lines of communication.

At this stage, discussion with staff will not take place. Since this part of the research is non-participatory, it is called 'observational resesarch'.

WEEKS 2-4:

By the second week, it should be possible to select people from the project team with whom to have one-to-one discussions. An initial sample of, say, 12 people would be chosen. The criteria for selection will be decided at the time of the study and, if appropriate, this decision may benefit from the input of others (e.g.). If the initial sample size proves not to be large enough to provide a reliable information base, then it may be necessary to request additional people.

The time taken to conduct each discussion would be minimal (about one hour) and the sessions would be spread over weeks 2-4.

At the end of the 4-week period, the Project Manager (and others) may wish to be de-briefed on the research work.

CAROLE BROOKE
CIT RESEARCH SCHOLAR
JANUARY 1990

APPENDIX

DISCUSSIONS WITH STAFF - AN OUTLINE

Areas covered in the one-hour discussions might include the following:

* Job Title and Areas of Responsibility

* How the Project Team Fits into the IT Group and the Organisation

* Personal Details including:

  Age; Education and Training; Previous Experience; Career Aspirations

* The Work of the Project:

  Exposure to the Technology; Staff Experiences

* How Much Staff Know about IT Group.

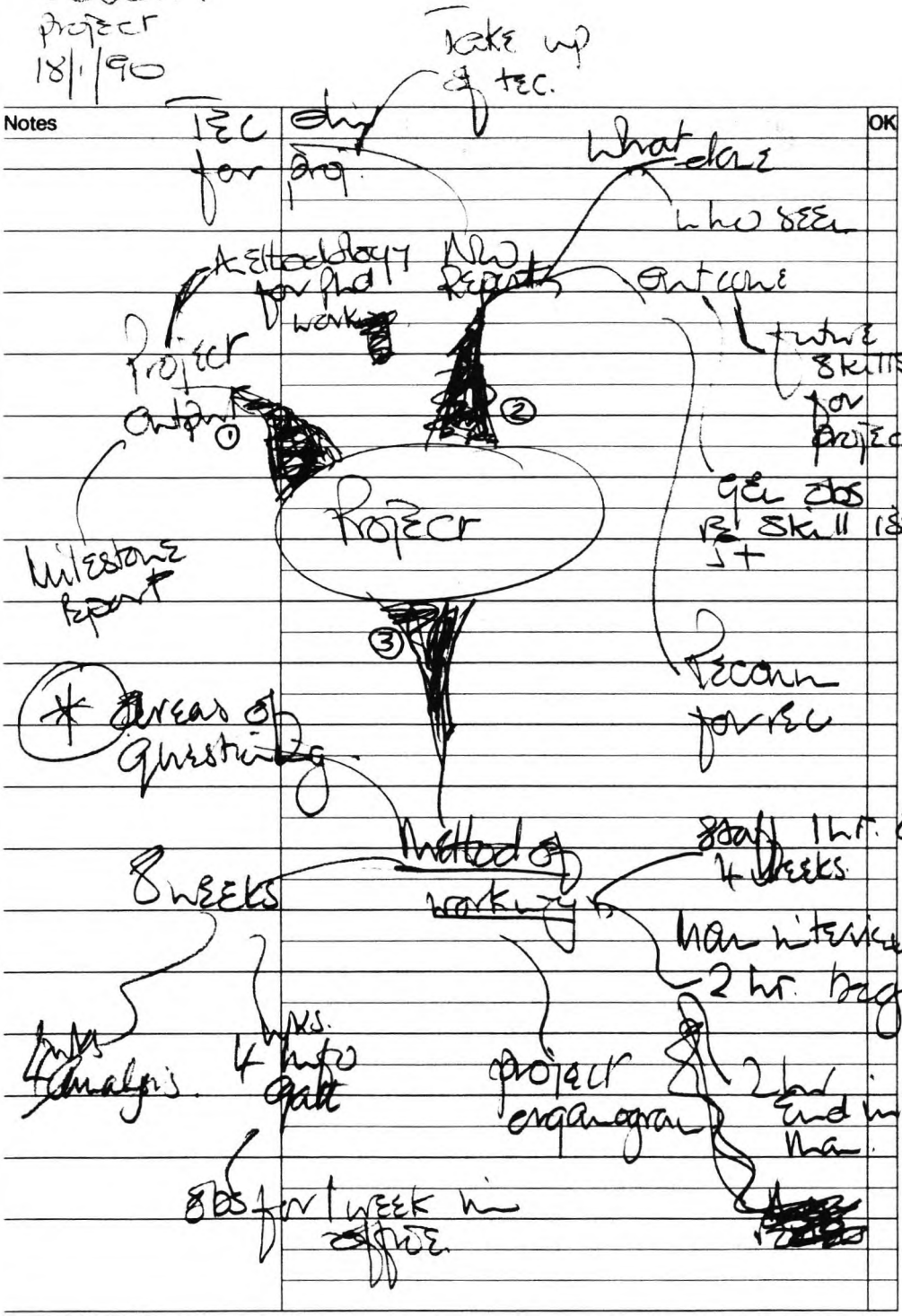
* How Much Staff Know about

CAROLE BROOKE
CIT RESEARCH SCHOLAR
JANUARY 1990

APPENDIX 8

The Mind Map

Cavelti
project
18/1/90



APPENDIX 9

The Feasibility Instrument

4th May, 1990

Dear

PHD FIELDWORK : STAGE TWO

As discussed at our Team meeting of 30th April, Stage One of my PhD fieldwork (conducted within) is complete, and I now seek another sponsor with which to repeat my research methodology and draw comparisons.

This mailing represents the Feasibility Instrument referred to in the Time Schedule (attached). Its purpose is two-fold:

1. To appraise your organisation of the criteria needed to complete my study and to ascertain which of the remaining three sponsors ( ) can best meet these.

The enclosed List of Criteria is in two parts: Practical and Scenario-based. Some criteria are vital, whilst others are desirable, and these are marked accordingly. In the event that no area can be found which fulfils all these, a decision will be made on the basis of 'best fit'.

2. Your company's response will be influenced by the perceived attractiveness and relevance of the study. To assist in this respect, therefore, I also enclose a Research Proposal.

We are all working to a very tight time horizon and, as you will see from the Schedule, I need to complete the Feasibility Study by the week beginning 4th June, at which time final decisions will be made. The target date for commencement of fieldwork is 11th June. Please do everything you can to help keep this part of the IT Skills Project on target.

I will keep you informed during the crucial 'decision week'. In the meantime, queries can be directed to me at my office, or messages left on my private answerphone number:

I hope that your response will be positive and look forward to hearing from you soon.

Best wishes.

Yours sincerely.

CAROLE BROOKE,
CIT RESEARCH SCHOLAR.

Encs. (4)

TIME SCHEDULE

DATE WEEK BEGINNING:	ACTIVITY:
7th May	Feasibility Instrument with sponsors for consideration,
14th May	Ditto
21st May	Ditto
28th May	Feasibility study drawn to a close,
4th June	Decision week: organisations' suggestions considered, decisions taken, all parties notified, and the necessary arrangements made for commencement of fieldwork,
11th June	Fieldwork commences at the sponsor's premises,
18th June	Fieldwork continues,
25th June	Ditto
2nd July	Ditto
9th July	Analysis and writing up commences,
16th July	Analysis/writing up continues,
23rd July	Ditto
30th July	Completion of Sponsor's Report,

CAROLE BROOKE
CIT RESEARCH SCHOLAR
May 1990

LIST OF CRITERIA

Practical Criteria

* four weeks on-site collecting information «VITAL»

* four weeks off-site analysing information and writing up «VITAL»

* access to the management and staff concerned «VITAL»

* <30 individuals in the area offered for study (considered a manageable size for research purposes) «DESIRABLE»

* fieldwork to commence on 11th June «DESIRABLE»

Scenario-based Criteria

* extensive use of leading-edge technology (but some use of old technology in conjunction with this is acceptable) «VITAL»

* the relatively recent, or forthcoming, introduction of Analyst/Programmers «VITAL»

* the presence of Analysts and/or Programmers, either in the past or currently «VITAL»

* the involvement of Business Analysts «DESIRABLE»

* long-serving as well as new employees «DESIRABLE»

* a broad range of seniority, IT experience, and general background amongst the staff «DESIRABLE»

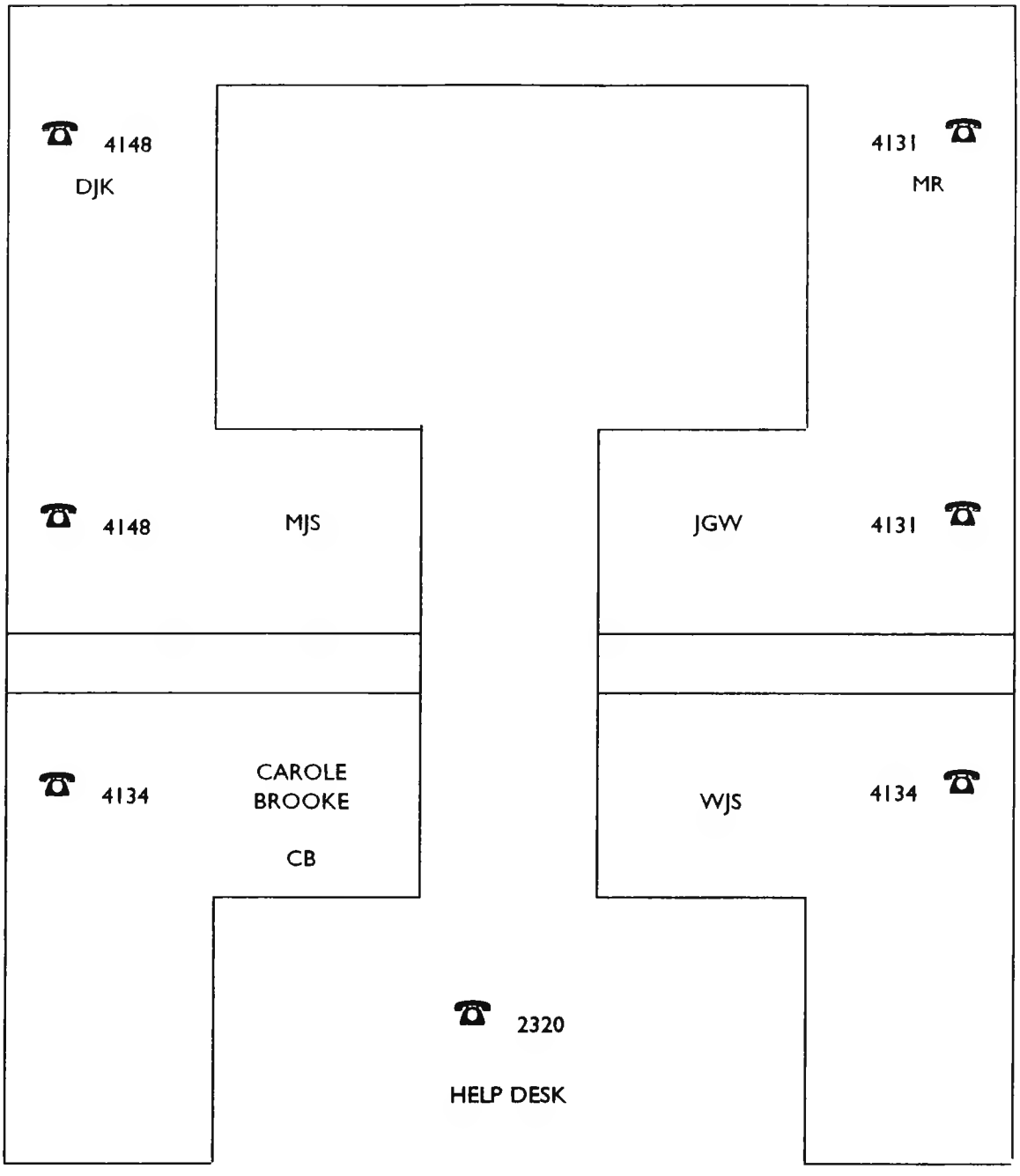
* a spread of technical and business expertise «DESIRABLE»

* men and women «DESIRABLE»

CAROLE BROOKE
CIT RESEARCH SCHOLAR
4th May 1990

APPENDIX 10

Project X: Seating Plan



APPENDIX 10: PROJECT X: SEATING PLAN

APPENDIX 11

Contents Lists from Final Reports to Sponsors

CONTENTS

CONTENTS

FIGURES AND APPENDICES ARE ATTACHED TO THE BACK OF THIS REPORT

APPENDIX 12

The Gospel According to the Project Manager

THE GOSPEL ACCORDING TO THE PROJECT MANAGER

In the beginning the Project Manager created the Programming Staff. The Programming Staff was without form and structure. And the Project Manager said: "Let there be Organisation", and there was Organisation. And the Project Manager saw that Organisation was good: and the Project Manager separated the workers from the supervisors, and he called the supervisors "Management" and he called the workers "Exempt".

And the Project Manager said: "Let there be a mission in the midst of the Organisation and let it separate the workers, one from another. And the Project Manager created the mission and he called it "The System". And the Project Manager separated those who were to benefit from The System from those who were to build it. And he called the former "Users" and he called the latter "Programmers".

And the Project Manager said "Let all the Programmers in the Organisation be gathered together into one place and let a Chief Programmer be brought up to lead them". And it was so. And the Project Manager saw that he was competent.

And the Project Manager said unto the Chief Programmer: "Create for me a schedule, so that I may look upon the schedule and know the Due Date". And the Chief Programmer went among his staff and consulted with them. And the staff was divided into two parts, one part was called "Analysts" and the other part was called "Application Programmers". And the Analysts went back to their desks and estimated, as was their custom. It came to pass that each Analyst brought his estimate to the Chief Programmer, whereupon he collected them, summarised them and drew a PERT chart.

And the Chief Programmer went unto the Project Manager and presented to him the estimate saying: "It shall take 10 months". And the Project Manager was not pleased and said "I have brought you up from the depths of the staff: you have not grasped the Big Picture". And the Project Manager hired consultants, and authorised overtime and he spake to the Chief Programmer: "Behold see all that I have done! The Due Date will be in five months". The Chief Programmer was much impressed and went from before the Project Manager and Proceeded to implement The System.

And the Chief Programmer sent his Analysts to the Users and said: "Let Specifications be written". And there were meetings, and lunches, and telephone calls. And the Specifications were written. And there was a Payday and the Happy Hour, one month.

And the Chief Programmer examined the Specifications and saw that they were too ambitious. And he separated the mandatory features from the optional features: and he called the mandatory features "Requirements" and he called the optional features "Deferred" and the Users called him names. Lo, the Chief Programmer gave the Specifications to the Analysts and said: Let the Requirements be analysed and let the Files be designated". And it was so. And the Chief Programmer said: "Let the Software Houses put forth their salesmen and let us have a Data Management System". And it was so.

The Software Houses brought forth all manner of salesmen who presented their packages, and claimed wondrous things for them, each according to his own file structure. It came to pass that a Data Management System was selected: and the Chief Programmer saw that it was good. And there was a Payday and the Happy Hour, a second month.

And the Chief Programmer said: "Let the system be divided into parts, and let each part be called a Module. And let programming teams be formed and let each be assigned to write a Module. And it was so and the Chief Programmer created the programming teams with two levels, a greater and a lesser, and he called the greater the "Senior Programmers" and he called the lesser the "Junior Programmers". And he gave the greater dominion over the lesser. And the Chief Programmer saw it was good. And the Junior Programmers saw it differently. And there was a Payday and a Happy Hour, a third month.

And the Chief Programmer said: "Let the programming be started and let much overtime be consumed, for there are but two months left". And the Programmers, both the Senior and the Junior, were much afraid, and they flowcharted and they coded, each in his own fashion. And the Chief Programmer looked upon the work and liked it not. And the Chief Programmer said: "Let there be a Standard", and there was a Standard. And the Programmers looked upon the Standard and liked it not. And there was a Payday and a Happy Hour, a fourth month.

And the Chief Programmer said: "Let there be Progress Reports, so we can monitor and control", and there were Progress Reports. And the Chief Programmer looked upon the Progress Reports and saw that the Due Date was not to be met. And the Chief Programmer arose, pressed his suit, shaved his beard and went unto the Project Manager and grovelled. And the Chief Programmer pointed his fingers, and caused Blame to issue forth upon all manner of creatures who sold Hardware and Software. And the Chief Programmer asked for an extension.

And the Project Manager was exceedingly angry, and cast doubts upon the Chief Programmer's ancestry: and uttered a multitude of threats. But it came to pass that an Extension was granted, and the Chief Programmer took the Extension back to the programming teams, and there was much rejoicing. And the programming of the Modules was completed. And there was a Payday and the Happy Hour, a fifth month.

And the Chief Programmer said: "Let the Modules be integrated, one with another, so that System Testing may begin". And it was so. And it came to pass that System Testing was completed. And there was a Payday and the Happy Hour, a sixth month.

Then the Chief Programmer did go to the Project Manager and said unto him: "Behold I bring you good tidings of great joy, which will come to all the Users, for on this day the System is completed". And suddenly there was with them a multitude of Users praising the Chief Programmer and saying: "Glory be to the System in the highest, but can you make this one small change?

APPENDIX 13

The New Street Theatre Company

THE NEW STREET THEATRE COMPANY PRESENTS:

"THE SOFTWARE DEVELOPMENT LIFECYCLE: A PLAY IN THREE ACTS"

Based on Method B

Written by: Carole Brooke and Eddie Osei

Directed by: Ken Crutch

****

ACT TWO PREVIEW

Thursday 9th August, 1990

CLOSED SHOWING - BY INVITATION ONLY

****

The performance will commence at 11.00 a.m. in the large conference room on the 14th floor. To end at 12.00 noon. There will be one interval of 5 minutes.

The performance will be followed by drinks at the pub.

FREE PROGRAMME

PRODUCTION SPONSORED BY FINANCE

"THE SOFTWARE DEVELOPMENT LIFECYCLE:
A PLAY IN THREE ACTS"

****

ACT ONE: EVALUATION

****

ACT TWO: BUILDING:

Scene One: Requirements Specification

Scene Two: Systems Specification

Scene Three: Internal Design

Scene Four: Construction

****

ACT THREE: SUPPORT

****

THE ACTORS (in alphabetical order):

Anand Bhansali, Les Busson, Justin Byrne, Ken Crutch, Paul Dann, Dave Ferguson, Lisa Fisk, Richard Hadwen, Mohinder Khosla, John Lau, Chandra Mouli, Eddie Osei, Mike O'Hara, Dennis Plank, Eleanor Reed, Jim Roche, Wendy Sim, Linzi Stock, Sue Tompkins, Andrew Will.

STAGE MANAGERS:

Ken Crutch and Lisa Fisk

SCRIPTWRITERS:

The Fixed Assets Team

TREATMENT WRITERS:

Finance

CASTING:

Levels 2 and 3

TECHNICAL TEAM:

Software Development Support

THE THEATRICAL METAPHOR

ROLES

PROJECT Y:

Actors
Director
Stage Managers
Scriptwriters
Critics

FINANCE:

Sponsors
Treatment Writers
Critics

SOFTWARE DEVELOPMENT SUPPORT:

Technical Team

THE REAL USERS:

The audience (critics)

PROCESSES:

THE PLAY = THE SOFTWARE DEVELOPMENT LIFECYCLE

ACTS = STAGES IN METHOD B

SCENES = PHASES WITHIN EACH STAGE

DRESS REHEARSAL* = THE TESTING

CLOSED SHOWINGS (press nights, etc)* = THE PILOT

PUBLIC SHOWINGS* = PROJECT Y RELEASE 1 +

SHOW CLOSES = PRIORITY 4?

* Note that there are overlaps with the processes above

APPENDIX 14

Beyond the Bottom Line: Competitiveness Through People

BEYOND THE BOTTOM LINE: COMPETITIVENESS THROUGH PEOPLE

In response to the increasingly competitive environment, characterised by uncertainty and unpredictability, large financial organisations started to initiate changes during the mid to late 1980s in structures, technology, and tasks. These are still under way. The aims being to increase sensitivity to their environment, to improve ability to introduce and manage change and heighten speed of response to change; to become proactive by anticipating and acting on the environment beforehand.

Many prescriptive steps have been proposed to achieve these objectives. Most are founded on the premise that information technology can be the key to organisational attempts to gain a competitive advantage. Wedded to this notion have been a number of practical steps which organisations have been advised to undertake to remain competitive.

As a consequence of the need to adapt to the environment and reassured by a convergence of advice on which steps to adopt, a series of trends have unfolded. These include market led strategies, a focus on customer satisfaction and attempts to keep existing customers, information technology (IT) delivery systems, flatter organisations, the pushing down of responsibility and the introduction of task cultures.

Evidence from a three year research project has confirmed the existence of these developments. The project was instigated by the Company of Information Technologists and undertaken by a research team comprised of members of City University Business School and managers from four leading organisations; British Telecom, Nationwide Anglia, National Westminster and the Prudential.

The aim of the project was to identify future IT roles and skills needs with a view to enhancing the competitiveness of City oriented organisations. Whilst much of the research concentrated on large firms in the financial sector, many of the conclusions are likely to be applicable to large user organisations in other service sectors.

Whilst finding evidence confirming that changes are under way, our research has, however, indicated not only that change-induced strategies are contextually dependent, but that they could be potentially flawed due to the omittance of the one factor which has in the past and will continue to determine an organisation's degree of competitiveness.

> **People within an organisation are the pivot upon which competitiveness ultimately depends, and, therefore,**
>
> **a successful organisation stems from the quality of its people, not from the application of technology or the range of products on offer.**

By placing the emphasis on, among other things, structural change and a customer focused ethos, both surrounded by the back drop of IT, we believe organisations are inviting the danger over time of misplaced priorities. Before change is attempted, raising awareness that people can enhance the competitiveness of organisations must be undertaken.

Inseparable to the issue of people is the dominant organisational culture. Most organisations recognise that the existing culture is unsuitable for the demands imposed by a competitive environment. Replacing a closed, cautious and process oriented work culture will need to be an open, innovative and more responsive work environment. Organisations can not (and invariably do not) expect this transformation to be either automatic or painless.

People and Culture Occupy the Centre Of Organisational Decisions

Most organisations, in order to contain costs (as well as to take advantage of new ways to organise work using IT), are now in the process of reducing staff numbers. As a consequence of reducing staff numbers, a fundamental challenge facing organisations will be to demonstrate a more open

and positive attitude to its staff. Changes in organisational structure, acceptance of new technologies, creation of new roles and business practices can be successfully introduced if commitment to these developments is first obtained from its staff.

> **Commitment must be founded on a shared set of values; not the organisations' preferred list but one derived from its members.**

Unless this occurs the potential residing in the initiated organisational changes will not be seen. For example, the benefits offered by IT, and more significantly, training in the use of IT, may have little appreciable impact if the organisational culture does not continuously reward (and provide the opportunities for) individual initiative and self learning.

From our research we are unable to offer our own guide or remedy. What we can contribute is a number of examples which illustrate why many of the organisational changes now under way could struggle to meet their objectives unless the affect of the changes on organisational members is understood. Being proactive in the business environment could become successful, but only after organisations are first proactive towards their own members.

> **Raising awareness about people in organisations is the priority and what better way to begin than to consider employees as if they were your most valuable customer.**

The following examples are taken from our research and address three organisational levels.

Changes at the Strategic Level

A recent development is the attempt to integrate IT and business strategies. In conjunction to this business units are being encouraged to assume ownership and management of the technology. This is impacting both the structure and role of the IT/IS function. Changes in roles and skills within the IT function will alter as a result.

Because of the changing position and role of the IT/IS function, the senior IT management team must adopt a leadership role to help ease the integration of IT and business strategies, and assume an active lead in introducing structural and role changes within the function. This will require communicating objectives and responding to the needs of senior and line staff within the business as they assume greater control over the technology. However,

> **our research has revealed the prevalence of a culture within the IT/IS function which is unique to the rest of the organisation.**

Organisations must try to break down the cultural barriers which form between professionals based in IT departments and users in other departments. While a certain amount of differentiation is desirable, the need for an effective partnership between IT professionals and users is paramount if a fast response to changing environmental conditions is to be achieved. Introducing the role of hybrids to bridge the gap between the IT/IS function and business units, to facilitate mutual influence and learning, consultation and support, is one strategic objective. But it is unrealistic to expect individual role holders to manage the necessary transition and overcome cultural differences without the crucial and visible support of top management.

> **All senior management must take an active role in assimilating IT from the periphery to the centre of the organisation.**

Changes at the Tactical Level

The IT/IS function is anticipated to assume an enabling and facilitating role. The function will be responsible for providing the infrastructure whereby information can flow electronically through the organisation.

Many organisations are reviewing if, and to what level, activities of the IT function can be contracted to a third party. The principal criterium to determine this is the extent to which an activity contributes to the competitive advantage of the organisation.

Whilst short term benefits may be accrued from contracting there is a danger that what remains performed in-house represents either strategically commissioned development work using the latest tools and techniques, or maintenance of old systems. Faced with a dichotomous choice IT professionals may seek alternative employment for their skills. In the long term this will be a waste to the organisation. In terms of the new, open and responsive culture,

> **organisations should determine which activities are contracted out based on the need to maintain the satisfaction and commitment of their IT professionals.**

Changes at the Operational Level

Many of the changes now under way will have the greatest impact on the organisation of work, roles and skills. The objective is to create a flatter organisational structure and to shift from a process to a task culture. Work will be performed by multi disciplined and highly skilled teams.

For these changes to be successful three human resource issues must be addressed. Firstly, the effectiveness of team working will depend on the availability of appropriate skills. The 1980s was seen by many to be the decade of skills shortages. Our research revealed that rather than a shortage of skills many organisations were unwittingly engaged in a skills wastage. In an attempt to acquire already skilled people the vast resource of potentially skilled people within organisations were overlooked. Most organisational members have now had some experience of IT. This experience should not be wasted but developed both for the benefit of the individual and the organisation.

Secondly, organisations must make provision for technical as well as managerial career paths, but at the same time building into the system the flexibility to enable individuals to cross between the two positions if a change in direction is desired.

Finally, the management of multi skilled teams will demand a new set of skills from role incumbents. They will be responsible for maximising the potential of individual team members. Team leadership must be aware that transforming work practices alone will not ensure achievement of the desired goals.

> **Intrinsic to successful team working is the need for individuals to accommodate the perspectives held by members from other backgrounds.**

The necessary acceptance will exist if what binds teams together is the shared set of values referred to earlier.

As we begin to witness the reality of a networked organisation, it is necessary to remember that information is only of value if used by people, and that the added value which can enhance competitiveness results when people are encouraged and allowed to use information in new and creative ways.

Conclusions

The changes now occurring across the financial services sector can realise their objectives, but only in the context of their impact on the organisation's people and culture.

Our conclusions are all the more significant given that our research was focused on IT skills and roles. The future for financial organisation lies with IT but only if driven by people. As four fifths of the working population at the beginning of the next millennium are already working, organisations must look to them and their needs to ensure prosperity, but preferably sooner rather than later.