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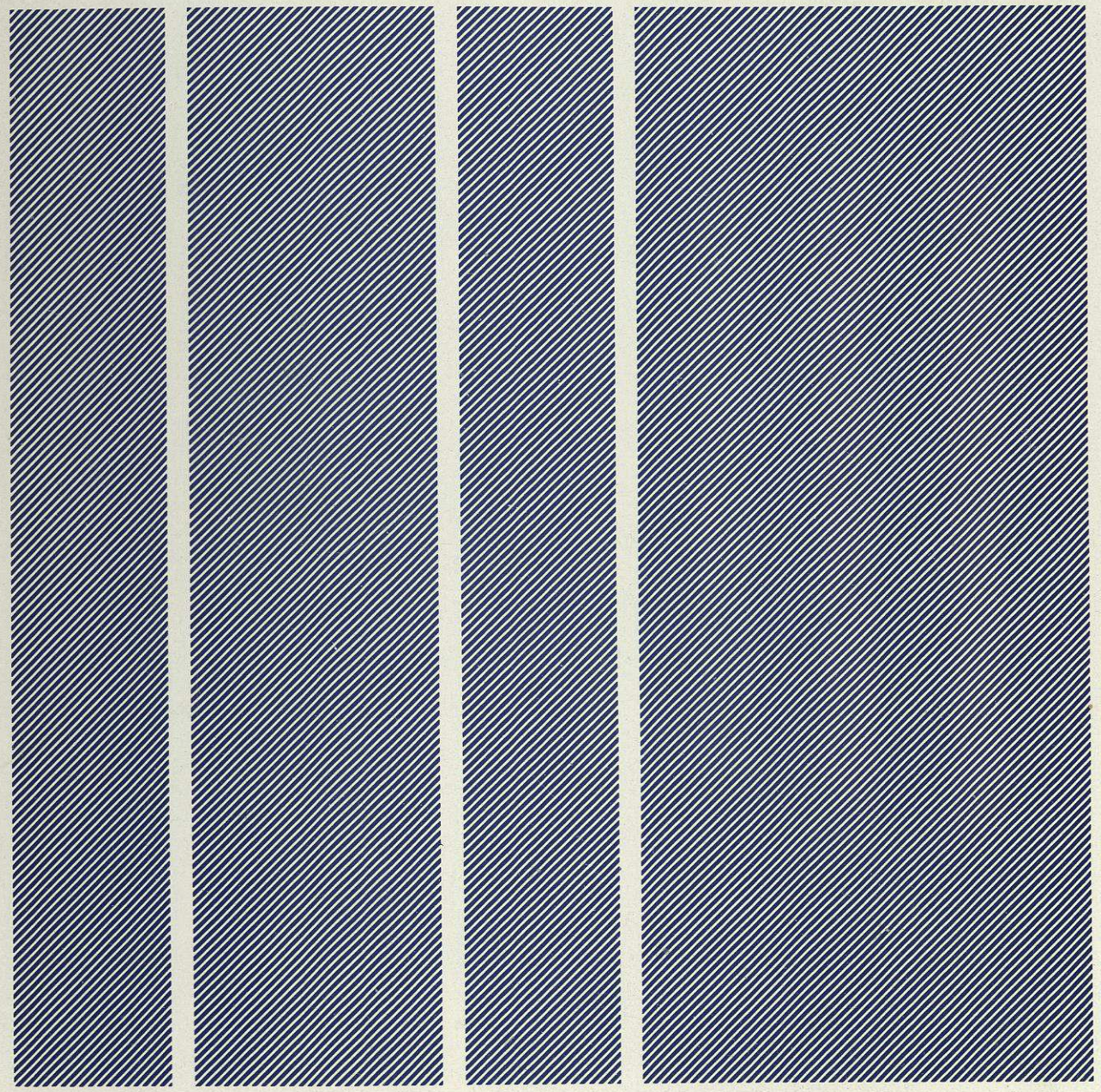
Developing and Implementing a Systems Strategy

October 1985



The Butler Cox Foundation

THE BUTLER COX FOUNDATION

REPORT SERIES NO. 49

DEVELOPING AND IMPLEMENTING A SYSTEMS STRATEGY

ISSUED OCTOBER 1985

Research Method

The research for this report was carried out during the Summer of 1985, and was led by *Tony Brewer*, a director of Butler Cox who specialises in systems management. He was assisted by: *Hugo De Haes*, a principal consultant with Butler Cox in Amsterdam, whose consulting assignments have included reviewing clients' information policies and providing training for clients' strategic planning teams; *Olaf Siedler*, a consultant with Butler Cox who specialises in business strategy; and *Elisabeth Somogyi*, Butler Cox's director of strategic consultancy, and a specialist in strategy formulation and the management of information systems.

A review of members' responses to the original research plan identified two important concerns. Several members requested that the research should include the difficult area of implementing a strategy and not be confined to the supposedly straightforward aspects of developing a strategy. Other members suggested that developing and implementing a systems strategy has a social and political component as well as an analytical one. As a result of these comments we modified the emphasis of the research so that these concerns were specifically investigated.

The research began with a review of the published literature on the subjects of business strategy, competitive advantage, systems strategy, applications of information technology, system implementation and the management of change. We also carried out a small survey of the views of chief executives on the subject of information technology and strategic systems planning.

The literature review identified the leading thinkers and practitioners in the field of strategic systems planning, and in June 1985 we visited the United States to discuss our ideas with some of them. We met with Bob Alloway (originator of the User Needs Survey methodology), James Cash (at the Harvard Business School), Jack Rockart and Michael Scott Morton (both at the Sloan School of Management), and Gregory Parsons (now at the University of Maine). Whilst in North America we also visited the systems departments in some large organisations to hear about their experiences of carrying out strategic system planning studies. Some of these experiences are reported in the case histories presented in the appendix of this report, as are the experiences of several European organisations.

We would like to thank these individuals, and also those organisations, who have given permission for their experiences to be included in the report.

Summary of research findings

Most organisations recognise the need for a systems strategy. As the use of information technology permeates through the organisation there is a growing awareness that systems need to be treated as a strategic business issue. Without a systems strategy, there is a danger of losing control of a strategic factor, and a risk that strategic decisions may be undermined by unsuitable tactical action. However, there is confusion about what a systems strategy is and about how to develop and implement a strategy.

Our research has shown that the traditional analytical approaches to systems planning were not able to produce plans that were truly strategic (although they did produce useful medium-term technical plans). Furthermore, these approaches largely ignored the problems of implementing a strategy. In this report we propose a new, unconventional approach to strategic systems planning that emphasises the social and political aspects of developing and implementing a systems strategy.

The main findings of our research are highlighted in the report synopsis.

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REPORT SERIES NO. 49

DEVELOPING AND IMPLEMENTING A SYSTEMS STRATEGY

CONTENTS

DEVELOPING AND IMPLEMENTING A SYSTEMS STRATEGY

REPORT SYNOPSIS

Most organisations that are at all dependent on information technology accept that they ought to have some kind of information systems strategy. This was the main message of Foundation Report No. 34 — Strategic Systems Planning — and, judging by the growing interest in the subject shown by Foundation members, the case is even stronger now than it was when that report was published in 1983.

Many approaches to strategic systems planning have been tried. Examples include IBM's Business Systems Planning, Nolan Norton's Stages of Growth, James Martin's Information Engineering, the Alloway methodology, and several analytical methods developed in France, such as Racines, Merise and Axial. Some of these approaches were described in Report No. 34. Others are referred to in Chapter 2 of this report and in the case histories in the appendix. Foundation members who have tried these approaches report that their use was worthwhile and that they produced useful results, often in the form of medium-term technical plans and better working relations with top management.

However, the so-called 'strategy' that resulted from these traditional approaches can scarcely be claimed to be truly strategic. It often had little impact on the organisation as a whole. Typically, it dealt with individual system development projects and particular items of a preferred supplier's equipment and software. Frequently, it omitted any reference to imaginative new uses of information technology that might have given the organisation a strategic advantage. These approaches generally laid heavy emphasis on exhaustive fact-finding and careful analysis, and they were time-consuming and technical. As a result, they tended to involve systems staff rather more than top management or users.

Various attempts have been made to improve the traditional methods but, in our opinion, none of them has been wholly successful. Thus, the situation today is that there is general agreement on the desirability of a systems strategy, but considerable disagreement on the best way to achieve it. This report must therefore answer the question "Is there a better way of developing and implementing a systems strategy?". We believe that there is, and that organisations can improve their performance through more-effective systems planning.

In this report we present a point of view on strategic systems planning that is quite different from that of Report No. 34. Our purpose is:

—To propose a new, unconventional approach to strategic systems planning.

—To describe a variety of planning tools and methods and to show how they fit within the proposed approach.

The main message of the report is that developing and implementing a systems strategy is not primarily a rational, analytical and technical activity. It is concerned more with commercial considerations than with technical considerations. Systems planners need to adopt a 'boardroom' point of view, giving more emphasis to social, political and business skills. Most systems staff, by aptitude and experience, lack these skills. The approach we propose will help systems planners to identify where these skills are needed for successful strategic systems planning.

CHAPTER 1

THE NEED FOR A NEW APPROACH

We believe that the traditional approaches to strategic systems planning are often inadequate because the results they deliver are not truly strategic. Nevertheless, attempts to improve the traditional approaches have accepted the assumptions upon which they are based — that strategic systems planning is basically an analytical process that takes place in a top-down fashion, in a stable homogeneous environment in which top management's goals and values are shared, or at least accepted, throughout the organisation. The result has been that, in trying to correct the deficiencies, newer approaches have concentrated on the analytical aspects and have introduced more exhaustive fact-finding or computer-based analysis. Regrettably, these so-called improvements have failed to solve the problem. The approaches have become more detailed and rigorous, but the resulting plans have not been any more strategic than before.

We believe that the underlying problem can be solved only by adopting a new approach. To appreciate why this is necessary, system planners must:

- —Understand the real meaning of systems strategy.
- —Understand the weaknesses of the traditional approaches.
- —Assess the trend in practical experience.

THE MEANING OF SYSTEMS STRATEGY

Strategy is an abstract concept. It is concerned with general objectives and directions of movement. A strategy can be described, but cannot be held or touched in the sense that one can hold or touch a system specification or even a computer program. Strategy becomes concrete and real only when it devolves into tactical action. But then it is no longer strategy, only the manifestation of strategy at a tactical level. For these reasons it is hard to describe a strategy, and harder still to say what is meant by implementing a strategy. During our research we failed to find any really satisfactory definition of a systems strategy in the literature, only descriptions of its characteristics.

The words 'strategic systems planning' could have two different meanings: either the planning of strategic systems or the strategic planning of systems. The term 'strategic systems' is now used frequently in the literature to describe information systems that have a crucial impact on the competitive position of an organisation. Examples include the American Hospital Supply order entry system, the range of systems services offered by Foremost McKesson to pharmacists, and the flight information systems offered by American and United Airlines. (For descriptions of these systems see the transcript of Dr Michael Hammer's presentation at the Foundation International Management Conference, The Hague, May 1984.)

One of the weaknesses of 'strategic' systems planning in the past was that it concentrated almost entirely on the existing and the obvious, and neglected the genuinely strategic issues. The result was that the so-called strategies were more like operations plans for the systems departments — of great importance to them but having little strategic impact on the organisation. This lack of strategic impact probably mattered little when information systems were merely a back-room service. Now, as information becomes an increasingly important component of products and services, and of the administration that supports them, information systems have increased in strategic importance. No organisation can afford not to search for strategic advantage through the application of information technology.

We accept that developing a systems strategy certainly includes the planning of strategic systems, in the sense of identifying imaginative uses of information technology that will give the organisation a competitive advantage. But strategic systems are not the only component of a systems strategy. Strategic systems planning should include the planning of the basic administrative systems that provide the bulk of the work in most systems departments. Strategic business planning includes the strategic positioning of existing products and services, as well as proposals for new products, services and markets, and strategic systems planning should follow the same approach.

Thus, the scope of a systems strategy includes the potential strategic applications of information technology, deservedly of great interest in the boardroom, and the long-term stability of the basic administrative systems. If the former is neglected the planning exercise becomes merely tactical from top management's point of view. If the latter is neglected, the systems service runs the risk of disintegrating through lack of management and coordination.

So, we believe that strategic systems planning includes all systems. But what do we mean by 'strategic'? The word is interpreted in different ways by different organisations. For some it implies long-term, high-level planning (see, for example, the SNCF case history in the appendix). Other organisations see a strategy applying to a single but crucial issue, such as the integration of newly acquired systems after a takeover. Others use the word to describe the achievement of some vision of the future (see, for example, the Kodak and Pfizer case histories). This multiplicity of meanings tends to add to the confusion. Moreover, an activity can often be defined as either strategic or tactical, depending on the point of view. A systems director's 'strategic' move to standardise on IBM, for example, may well be regarded as a technical tactic by his boss.

Our description is that a systems strategy is a fairly general statement of the direction in which information systems should develop, over the medium-to-long term, in order to support the organisation and achieve certain agreed strategic objectives. It should include some indication of the resources required and the priorities for the application of those resources. The strategy is written in boardroom, rather than computer-room, language and it provides the link, which is so often missing, between the organisation's business strategy and the detailed plans for systems applications, systems management and technical infrastructure.

It is important to have a systems strategy, and to get it right, because the strategy, although abstract, provides a framework for concrete tactical action. It therefore helps to ensure that day-to-day activities take place within, rather than outside, the strategic framework. The existence of a systems strategy will often help to place problems in their proper perspective. Often, problems at the tactical level are merely symptoms of more fundamental problems at the strategic level. Examples are provided by the argument about Wang versus IBM in the KLM case history, and the feeling of unease and complexity described in the Pfizer case history.

WEAKNESSES OF THE TRADITIONAL APPROACHES

We have argued that the basic weakness of the traditional approaches to strategic systems planning is that they are based on an inadequate description of a systems strategy. How can you hit a target if you do not know what, or where, it is? But there are two further weaknesses of the traditional approaches. They have failed to gain the attention and interest of top management because they have demanded that top managers take an interest in technical matters; and the approaches have largely ignored the problems of implementation.

Gaining the attention and interest of top management

If information technology really is a strategic issue for an organisation then, by definition, top management should be involved with it. If they are not involved then the issue is not regarded by top management as strategic. We believe that, today, information technology should be a boardroom issue because it can impact all of the strategic competitive factors that affect an organisation (see Chapter 4). Technology, and especially information technology, defines the range of an organisation's strategic options and the means to achieve them. It is not a question of whether there is a link between technology and business strategy, only whether top management chooses to see it.

As information technology diffuses through the organisation, the authority of specialised professional systems management is being seriously undermined, just at the time that information technology is being recognised as a strategic issue. This situation creates two serious problems: there is a danger of losing control of a strategic factor, and there is a risk that strategic decisions may be undermined by unsuitable tactical action.

For these reasons information technology should be an important component of an organisation's strategic thinking, and top management ought to be interested and involved in its management. But the experience of many systems directors is that their top management appears not to be interested. Why should this be?

The first reason is that it is very easy for different levels in an organisation to have different views about what constitutes a strategic issue. For a systems director, the choice of an operating system, or of a communications protocol, or of a database management system, is certainly strategic, in the sense that it will affect the level and nature of his systems service for many years. Because he believes that the technology is important for his organisation, and that any competent business director should understand it, he tries to involve his boss with the technology. The typical reaction of his boss is to feel uneasy. He feels guilty, albeit unconsciously, about neglecting the issues that are genuinely strategic to him. And he probably feels irritated about being involved with the

technology, partly because he does not understand it and partly because he employs a highly paid specialist to handle these (to him) tactical issues.

In addition, top managers know that, as decisions become harder to take and riskier, the decision-taking process becomes more emotive, less rational and more conservative. They tend to distrust people who believe that 'better' information and more-formal systems will lead to better decisions. They do not have a natural affinity with analysers and systematisers. The typical person who has been promoted through the systems department may not appreciate this attitude. He has been trained to think in terms of right and wrong answers, and he may feel very frustrated when top managers do not see things from his point of view. Peter Keen has suggested that information plays a much smaller part in decision taking than most systems people realise (see Reference 1). When decision takers are under pressure they disregard facts and figures; they simplify and rely on experience. As a consequence, top management may regard plans for new systems as irrelevant for their purposes.

Another reason that prevents top managers from being involved is that they may feel threatened by the organisational changes implied by a strategic systems planning exercise. Research studies (see Reference 2) have shown that, when threatened with organisational change, people typically exhibit one of three types of behaviour — aggression, projection or avoidance — depending on their status and role. The typical reaction of top management to innovation, and to the organisational change that goes with it, is to exhibit avoidance. If their previous experience of strategic systems planning has not been good, they are likely to be suspicious of further attempts. This attitude is described in the ICI case history, where top management had developed a suspicion of systems strategy as a result of having had their expectations raised but unfulfilled during lengthy formal planning studies in the early 1970s. As a result, strategic systems planning went out of fashion in ICI during the late 1970s.

For all these reasons, top management has readily available excuses for not getting involved with information technology, even when they know that they should.

Problems of implementation

Implementing any kind of system requires some degree of change. The more extensive the system, and the greater its impact, the greater will be the degree of change. If the new strategy is anything other than a continuation of the existing one, it follows that implementation at the strategic level will require a profound degree of change. The prevailing attitude has been that, provided the strategy is good enough, implementation will look after itself. Consequently, most of the traditional approaches ignore implementation.

The problems of implementation arise from people's inbuilt resistance to change and are associated with:

—Social inertia.

—Modification of objectives.

—Office politics.

—Differing value systems.

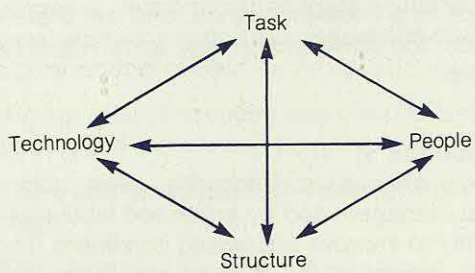
These are all negative factors, leading to deliberate or unconscious resistance to change, and to the use of counter-implementation measures.

Social inertia

All social systems have an inherent inertia, which tends to absorb and dampen out the intended effect of change. No matter how hard you try, nothing seems to happen. Most organisations consist of federations of work groups, which often have great autonomy, and sometimes also have the ability and the inclination to modify the organisation's strategic objectives. As a consequence, large changes are difficult to achieve, and they may be avoided or even resisted. Successful change needs to be incremental and evolutionary. Harold Leavitt (see Reference 3) has suggested that there are four social forces in an organisation, and he labels these as task, technology, people and structure. He contends that the interactions of these forces can be represented by a diamond shape, as shown in Figure 1. If technology changes, the other forces adjust to absorb and dampen out the effect. The result is that it is difficult to achieve any significant degree of change.

Most approaches to overcoming resistance to change are based on the Lewin/Schein theory of the management of change (see References 4 and 5).

Figure 1 Leavitt's Diamond



The interaction of the social forces in an organisation

(Source: H. J. Leavitt, Handbook of Organisations, 1965).

This theory states that change can be described as a three-stage process — unfreezing, moving, and refreezing. To achieve a successful change the situation must first be 'unfrozen'. In other words, the people affected must be prepared for the change and persuaded that it is in their personal interests. Next, the situation must be 'moved' from the existing to the desired state, without creating any additional resistance. Finally, if the change is to be made permanent, the situation must be 'refrozen', with the new situation accepted and preferred by those affected.

Most of the traditional approaches to strategic systems planning largely ignore this theory. They assume that the benefits of the proposed strategy are self-evident, so that no unfreezing is necessary. They ignore the counter-implementation tactics that often arise during moving. And they also ignore the need to establish and refreeze the new strategy.

Modification of objectives

In his presentation to the Foundation Management Conference at Torquay in 1983, David Buchanan described research that illustrated how the objectives of a plan may be modified during its implementation. He suggested that a systems plan that is justified in strategic terms by top management may be seen in tactical or operational terms by department managers and in working-activity terms by system users. "Middle managers have the ability to subvert the organisation's strategic aims by mis-managing the change process." The result is that the plan, as implemented, turns out to be very different from the plan as originally developed. Not surprisingly, top management then considers that the strategy has been badly implemented.

Another example is provided by the political manoeuvring that took place during the implementation of strategies in British Telecom (described by Roy Wernham in Reference 6). He concludes "Each organisational level appears to take action to put its own stamp on the strategy, so that strategy formulation and implementation are part of a continuous interactive process, rather than successive steps in a linear sequence, and are therefore much less 'top down' than many texts would have us believe."

Office politics

Impending change is frequently seen both by individual managers and by organised labour as an opportunity to improve status and conditions. There are many examples of systems strategies being resisted, not primarily on technological grounds, but because negotiations concerning their implementation had not proved acceptable to all the parties involved.

A new systems strategy can also be seen as a threat to the existing organisational structure, and be strongly resisted for this reason. In his book "Information Payoff — the transformation of work in the electronic age" Paul Strassman has described the characteristics of bureaucratic organisations. They exhibit high degrees of work specialisation and high levels of vertical integration, quality is determined more by the relationship between specialists than by the skill of individuals, and a large proportion of the available effort is expended on maintaining these relationships. Any threat to the structure is strongly resisted.

In the systems field many Foundation members must have experienced the arguments that can arise over the meaning and ownership of data. Control of data is frequently perceived as a source of political power and influence. Plans for new systems often pose a threat to the control of data and are therefore resisted.

Differing value systems

There is a tendency for change, especially that arising from implementing a systems strategy, to be driven by technical considerations and an 'engineering' view of people and systems. Interestingly, James Martin uses the term 'information engineering' to describe his approach to strategic systems planning and describes it as "the set of interrelated disciplines that are needed to build a computerised enterprise based on today's data systems. The primary focus of information engineering is the data that is stored and maintained by computers and the information that is distilled from this data" (Reference 7).

However, the engineering view, with its focus on commercial values based on efficiency and effectiveness, can conflict with human values based on job satisfaction, personal choice and the need for individualism. Frequently, systems strategies are justified only in terms of commercial criteria. They are aimed at satisfying economic and technical, rather than human, objectives. Nevertheless, those affected by the strategies perceive them in terms of human criteria. From their viewpoint some strategies are not justified and so they will be resisted.

THE TREND IN PRACTICAL EXPERIENCE

The third reason why systems planners should consider adopting a new approach to strategic systems planning is that there is evidence that the leading organisations have already appreciated this need and are approaching strategic systems planning from a new point of view. During our research we met with several organisations that had recently carried out at least one major strategic systems planning exercise, and the experiences of six of them are

reported in full as case histories in the appendix. We summarise below the main points from each of the case histories, illustrating a trend away from detailed technical analysis during the planning process and towards greater emphasis on the business and political aspects of working with top management. The case histories demonstrate also that there is a trend towards lower-cost studies with shorter timescales, with increased management involvement but over a shorter time period, and explicit recognition and management of the political impact of strategic systems planning studies.

Conglomerates Inc.

This case describes the attempts made by a large North American company to use traditional approaches to strategic systems planning during the 1970s. (We have presented this company's experiences anonymously because the results were not very successful.) The significant points to emerge were:

- —The planning exercises were carried out against a background of organisational restructuring and commercial decline.
- —Slow and inflexible methods, with an overemphasis on detailed analysis, were used.
- —These methods were unsuitable for the company's rapidly changing environment.
- —The high credibility of the MIS manager, good support from top management, and helpful input from IBM all contributed to a decision to use IBM's Business Systems Planning (BSP) method.
- —There was a close relationship between business strategy and systems strategy. One business strategy led to one set of applications; a different business strategy led to a different set of applications.
- —The main new application was not identified by any of the formal methods.

SNCF

This case describes the use of a formal method in the Société National des Chemins de Fer Français—the French National Railways. The significant points to emerge from this case history were:

- —The political pressure to run the railways profitably acted as an unfreezing factor, and raised management's awareness of the potential of information technology.
- —The appointment of a new data processing director also acted as an unfreezing factor.
- —A well-described formal method, which was easy to understand, comprehensive and proven, was chosen.
- —Top management, five user groups and more than 300 individuals were involved.
- —There was a heavy emphasis on cost-justification and profitability of projects, with consequent delay imposed by top management because these were not clear.

KLM

This case describes the use of the Alloway methodology in a international airline. The significant features were:

- —The systems department had a high level of credibility at the start of of the exercise.
- —The appointment of two new directors contributed to the unfreezing of the situation.
- —A strategic problem (how to organise and manage computing and office automation services) was recognised by its tactical symptoms (the argument about Wang versus IBM).
- —There was a strong emphasis (inherent in the method) on detailed analysis, and a high level of user involvement.
- —The resulting strategy combined both short-term and long-term actions.
- —A detailed analysis provided the material from which to develop action plans. These plans were largely accepted, because they were based on users' stated needs.

Pfizer

This case describes the use of an informal approach in a large North American pharmaceuticals company. The significant features were:

- —The starting position was apparently satisfactory but, nevertheless, there was a feeling of unease.
- —The focus was on creating and realising a vision of the future.
- —The strategy was formulated by discussions amongst systems managers, without either detailed analysis or the involvement of top management and users.
- —A great deal of attention was given to 'selling' the strategy to the various planning audiences.
- —There was resistance to the strategy from systems staff.
- —The success of the exercise was based on a close working relationship between systems management and top management, the high credibility of systems management, propitious timing, and moving with the general trend in the industry.

Kodak

This case describes the use of an unusual new approach in a large North American manufacturing and photographic supplies company. We regard the significant features of Kodak's experience as:

- —The planning group was established on the initiative of the divisional management.
- —The members of the group came from a wide variety of backgrounds in the company. Most came from outside the systems department.
- —The group did not use any of the traditional formal methods, but applied their group members' experiences of strategic planning in other areas of the company.
- —The group emphasised that user managers needed to integrate systems objectives with business objectives.
- —The group recognised the importance of selling the strategy to those affected by it.
- —The success of the approach depended heavily on setting up effective working groups and on achieving good working relations within those groups.

ICI

This case describes the use of Rockart's critical success factors (CSF) approach in a large United Kingdom chemicals company. In our view, the significant features were:

- —ICI used formal methods extensively in the 1970s. These are now seen as slow and clumsy, and as a contributory factor to the alienation of top management.
- —ICI now carries out an intensive one-week planning study, using the CSF approach, assisted by outside consultants. This planning study is followed by a detailed technical planning study within the systems department.
- —The CSF approach is applied at the strategic business unit level within an operating company, and involves the chief executive and his management team.
- —The CSF approach has been very successful, particularly in clarifying the business issues.
- —The benefits resulting from the planning process are felt far to outweigh any shortcomings in the actual results.

SUMMARY

In this chapter we have demonstrated that a new approach to strategic system planning is needed. A careful analysis of the real meaning of the term 'systems strategy' has shown that the traditional approaches to systems planning could never hope to deliver plans that were truly strategic. The case history experiences show that the weaknesses of the traditional approaches have been recognised by many organisations as they have grappled with the problems of strategic systems planning. The result has been a series of ad hoc solutions developed to meet the specific needs of individual organisations. In the next chapter we identify the lessons that can be learnt from the experiences and, drawing on other insights gained during our research, we propose a new framework for strategic systems planning.

CHAPTER 2

A FRAMEWORK FOR STRATEGIC SYSTEMS PLANNING

In thinking about any complex subject, especially one as abstract and difficult to define as systems strategy, it is helpful and natural to adopt some kind of mental framework. A framework provides a structure for organising the thoughts and language used to discuss the subject. A good framework should be interesting, thought-provoking and useful, and should serve to:

- —Highlight the more important features of the subject.
- —Suggest what aspects are less important.
- —Identify similarities and differences between the issues.

The use of such a framework for strategic systems planning would help to overcome some of the difficulties discussed in Chapter 1. It would focus attention on the meaning and purpose of a systems strategy. It would also help to ensure that all the aspects of strategic systems planning were considered, not simply the easy or obvious or analytical aspects. And it would provide a means of distinguishing between strategic and tactical issues.

Several frameworks for strategic systems planning are available and widely used. They include:

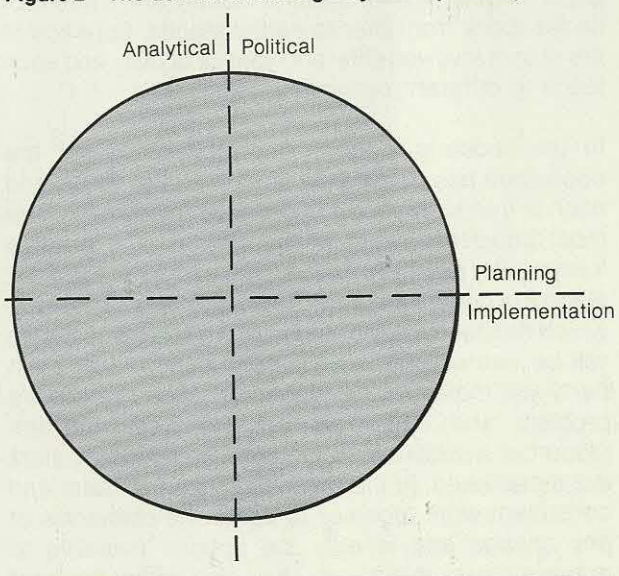
- —Nolan's stages of growth.
- —Data architecture approaches (including BSP and Information Engineering).
- —The technical approach.
- —The socio-technical approach.

All of these frameworks have their strengths and weaknesses. Conglomerates Inc. found that the stages of growth framework provided a useful analysis that identified missing systems and missing links between systems. BSP and Information Engineering are both good ways of developing a data architecture once an overall systems strategy has been agreed. Many organisations, especially those where the business strategy is not clear, have developed a technical strategy that has enabled them to take advantage of technical developments and to achieve benefits in terms of lower costs and increased security. And the socio-technical approach (developed by the Tavistock Institute and described in Foundation Report No. 25 — System Development Methods) has been used successfully, especially in inexperienced or conservative environments.

In developing our thinking about strategic systems planning, we have found it helpful to envisage the strategic planning and implementation domain as being divided into four quadrants, as depicted in Figure 2. One axis divides the analytical activities from the social and political activities; the other axis divides the planning aspects from the implementation aspects. This is a simple framework, which indicates the four main areas that should be considered during the planning process.

We began our research for this report where Report No. 34 finished — looking for better methods to apply within the traditional analytical approach to systems planning. Without doubt, a huge amount of time and intellectual effort has gone into devising better methods but, for the reasons given in Chapter 1, we believe that these methods will never be able to produce truly strategic results.

Figure 2 The domain of strategic systems planning



Fortunately, we were influenced by the work of Michael Treacy, who has argued (see Reference 8) that research on the application of information technology should draw on existing work in corporate strategy and industrial economics, rather than concentrate so much on reinventing old wheels. We therefore widened our search for strategic system planning methods and, to our initial surprise, we discovered a new approach that radically changed the emphasis of our thinking on the subject. We found a framework, known as the Kolb/Frohman model, that had originally been developed in the field of social psychology, and had then been transferred to systems project management. We believe that it can also be applied in the field of strategic systems planning. We now describe the model and show how it can be mapped onto the simple framework depicted in Figure 2.

THE KOLB/FROHMAN MODEL

The Kolb/Frohman model was devised in 1970 as a means of describing and explaining the consulting process (see Reference 9). It is based on the Lewin/Schein theory of organisational change — unfreezing, moving, and refreezing. It describes the stages through which a successful consultancy assignment should progress. It is concerned with the relationship between a consultant and his client: to whom does the consultant relate; who influences whom; how open and honest will consultant and client be with each other? It is also concerned with the nature of the work: how is the assignment defined; when does it start; when does it finish; who does what; what benefit does each party derive?

The model is based on a seven-stage process: scouting, entry, diagnosis, planning, action, evaluation and termination. The stages may overlap, they may occur sequentially or simultaneously and there can be feedback from later to earlier stages. But each of the stages involves different types of activity and each leads to different outcomes.

In the scouting stage neither the client nor the consultant has committed himself to the other, and each is free to explore the potential relationship. The most important result is the choice of a suitable formal entry point to a further relationship. In the entry stage the consultant and client negotiate a contract, which defines whether and how the following stages will be carried out and the contributions that each party will make. In the diagnosis stage the client's problem and objectives are explored, and the resources available from the client and the consultant are established. In the planning stage the client and consultant work together to agree the objectives of any change and identify the options available to achieve those objectives. They also select the best option. In the action stage the best option is implemented. In the evaluation stage the results of the action so far are reviewed and a decision is taken whether to cycle back to an earlier stage to improve the results or to proceed to the final stage. In the termination stage ownership of the solution is transferred to the client.

Development of the model

The model has been transferred by Michael Ginzberg from the consulting process to the process of developing and implementing an information system (see Reference 10). He believed that the success of a system development project would depend on successfully unfreezing, moving and refreezing. He therefore decided to test the applicability of the Kolb/Frohman model to the system development process.

Ginzberg studied 29 system development projects and measured their success in terms of user satisfaction. He then analysed the development activities of each project in terms of the seven stages of the model and showed that the more successful projects had been developed in a way that correlated strongly with the seven stages. He also showed that there was a much lower success rate on more-complex than on less-complex projects, but that there was some evidence to suggest that successful complex projects had paid particular attention to the entry and diagnosis stages.

These findings started us thinking about whether the Kolb/Frohman model could also be transferred to the strategic systems planning process.

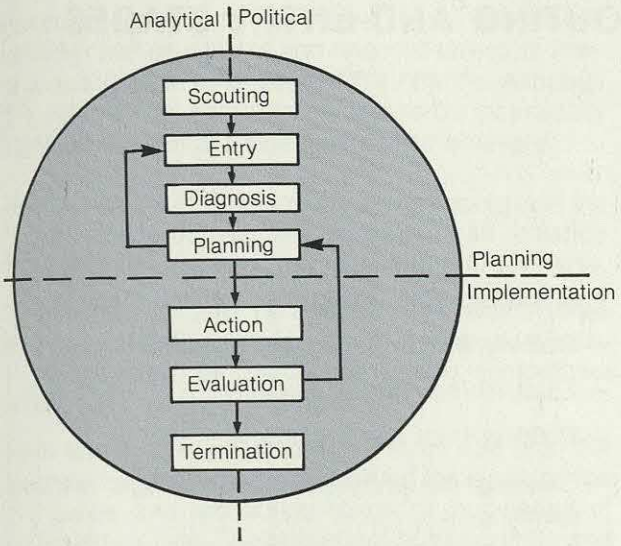
APPLICATION OF THE MODEL TO STRATEGIC SYSTEMS PLANNING

Strategic systems planning can be regarded as a highly complex project. We believe that Ginzberg's findings relating to the likely success of complex system development projects ought to apply also to the development and implementation of systems strategies. Figure 3 shows the Kolb/Frohman model superimposed on the simple planning framework shown in Figure 2. (For simplicity, Figure 3 shows each of the seven stages as being equally concerned with analytical and political aspects. As we point out later, this symmetrical emphasis does not apply in practice.)

We have redefined the seven stages of the Kolb/Frohman model in strategic systems planning terms, as follows:

— Stage 1 (scouting) involves making contact with top management, opening channels of communication, building confidence and credibility, raising awareness of common concerns and opportuni-

Figure 3 The Kolb/Frohman model and the domain of strategic information management



ties, and creating an opportunity for entry to the subsequent stages of strategic systems planning.

—Stage 2 (entry) involves establishing the nature, importance and benefits of a systems strategy, and gaining commitment by top managers, and authority from them, to proceed with the planning study.

—Stage 3 (diagnosis) involves identifying business objectives and related opportunities for using information technology. In the diagnosis stage the available resources are also identified and agreement is sought on the priorities.

—Stage 4 (planning) involves generating options, identifying resource and timescale implications, exploring the political implications of the various courses of action, and gaining agreement for a particular course of action (the strategic direction).

—Stage 5 (action) involves converting the agreed strategic direction into tactical goals, with resources and responsibilities clearly allocated. An important part of the Stage 5 activities is to remove any resistance to the planned changes.

—Stage 6 (evaluation) involves reviewing progress, and either adjusting the strategy to take account of changes in objectives or priorities, or amending the action plans to get back on course.

—Stage 7 (termination) involves either aborting the planning study if the strategy has not been successfully implemented, or absorbing the planning process into the everyday work of strategic systems management, so that strategic systems planning is no longer a special task but a normal part of the job.

Our conclusion is that the Kolb/Frohman model of the consultancy process does provide a useful framework for strategic systems planning. This framework highlights the need to focus particular attention on the scouting and entry stages, so as to gain the involvement and support of top management. It also focuses attention on the importance of the evaluation and termination stages of implementing the strategy. The model also supports our view that social and political activities are as important in strategic systems planning as is analytical activity.

In the remainder of this report we describe a variety of methods that can be used for planning and implementing a systems strategy, and we show how they fit into the above framework.

CHAPTER 3

THE GUIDING FRAMEWORK — SCOUTING AND ENTRY STAGES

We group the first two stages in the Kolb/Frohman model together because they are both concerned with gaining the interest and attention of top management and with creating an opportunity to carry out a strategic systems planning study. In terms of the Lewin/Schein theory of managing change, these two stages are equivalent to the unfreezing process.

SCOUTING

The purpose of the scouting stage is to create an opportunity for discussing strategic systems planning with top management. There are various potential topics of interest in the relationship between top management and information systems management. These topics might include the technology itself, the use of information technology as a means of reducing costs, the problems of using information technology, top management's personal use of the technology, and so forth. There is always a risk that the relationship will be diverted onto one of these topics. Indeed, some top managements may deliberately do this in an attempt to avoid involving themselves in strategic systems planning. Information systems managers must guard against this possibility and must ensure, in a subtle but determined way, that the relationship is always moving forwards towards the goal of strategic systems planning.

Successful scouting is a gradual, long-term process. It is a continuous, 100 per cent political activity and it can easily be undermined by a loss of credibility.

In theory,the scouting stage starts with no commitment on either side, with each party (top management and systems management) free to explore the potential relationship. Sometimes, the starting position may be favourable in that systems management may already have high credibility and a good working relationship with top management, or top management may be keen to discuss strategic systems planning. More likely, there will be negative factors to overcome. In the case histories, KLM and Pfizer started from strong positions, whereas Conglomerates, SNCF and ICI all had historical or current barriers to overcome.

The specific activities in the scouting stage are:

- —Gaining access to top management.
- —Establishing communications.
- —Building trust and credibility.
- —Creating the entry point for strategic systems planning.

Gaining access to top management

Gaining access to top management depends on status, good communications, geography and timing. Systems management needs either to have a high status in the organisation, or to be included in formal communications between top managers, or to be physically close to top management so as to be included in informal communications. As Paul Strassman said at a Foundation Management Briefing held in London in May 1985: "If the head of systems is not a party to discussions on organisational strategy he should ask himself why".

An external agent, such as a supplier or consultant, may be able to help in gaining access to top management. IBM is particularly good at this, as many Foundation members have doubtless found, and as is illustrated in the Conglomerates case history.

Establishing communications

Establishing communications with top management, once access has been gained, involves using a common language, finding common concerns to discuss (such as business opportunities, competitors' activities, and technological developments), discovering top management's 'hot buttons' and avoiding topics that, from top management's viewpoint, are low-level and boring. A carefully planned education programme for top management also can be successful as a means of establishing effective communications.

In his presentation to Foundation members, Paul Strassman also suggested that the systems strategist must acquire the skills of corporate planning (with which top management is probably familiar and comfortable). Strategic systems planning should

therefore be regarded as corporate planning with a focus on information technology.

As part of our research for this report we interviewed several chief executives and financial directors from organisations on both sides of the Atlantic. Although the sample was not large enough to be statistically significant, several interesting points emerged:

- —The majority of these top managers recognised the importance of their existing systems in reducing costs and increasing management effectiveness.
- —The majority also recognised that, within three years, effective application of information technology would be one of the keys to competitive success for their organisations.
- —In terms of its influence on overall strategy, the systems function was considered to be behind the finance and production functions but ahead of research and development, marketing and personnel.
- —The majority of these top managers recognised their responsibilities for setting the overall direction for the use of information technology, and about one-third of them saw this as a crucial aspect of their job.
- —There was a strong correlation between recognising the growing importance of information technology and carrying out medium-term (three to five years) systems planning.

Thus, our small survey suggests that the myth, believed in many systems departments, that top management is not interested in information technology and is anxious to avoid getting involved, is not true. The truth is probably that top management is very interested in applications and benefits (the ends) but is rarely interested in the technology and its language (the means).

Building trust and credibility

Building trust and credibility with top management, once communication has been established, is an essential step towards the goal of strategic systems planning. This activity requires systems management to demonstrate that it is reliable, useful and has good sense. The head of systems probably starts with certain disadvantages, associated with the usual perception of the systems management role in the organisation. Not only must he be able to convince a possibly sceptical top management that he can manage his own department competently, he must also convince top management that he has things to say that are worth listening to. Providing a good systems service has a continuous but slow positive effect in building credibility. A poor service can destroy credibility.

Systems management must therefore find a way of convincing top management that it is right and natural for systems staff to be involved in corporate strategic planning. This is a two-edged problem. Top management initially may not feel comfortable with the idea of systems staff becoming involved with strategic issues. Information systems may still be regarded as a back-room service. For the same reason, systems staff may feel out of place discussing strategic issues with top management. It is important to establish the legitimacy of the claim to be involved with corporate strategy in order to be able to widen the scope of strategic systems planning and to build confidence and credibility. Again, an external agent can help to legitimise the role.

At the scouting stage, building trust and credibility is more important than demonstrating technical understanding. Appointing a trusted general manager from another part of the organisation is sometimes a good way for top management to get strategic systems planning under way. When Kodak set up its systems strategy department the staff appointed had all established their reputations in other parts of the business, and most of them were appointed from outside the systems department. An interesting comment was made to us when we were researching the Pfizer case history. We were told that the systems director was a close professional colleague of the chief executive; he was seen by top management as Max Hughes, who happened at that time to be head of systems, rather than as the head of systems whose name happened to be Max Hughes.

Creating the entry point

Creating the entry point — that is, creating and grasping the opportunity to discuss strategic systems planning with top management — requires some form of unfreezing action. This action may arise from external factors such as technological development or competitive pressure, or it may be prompted by internal factors such as an organisational change or skillful action by systems management. In the KLM case history, the appointment of new directors to the engineering and maintenance division and to the systems department created a new situation and thus an opportunity to discuss strategic systems planning.

In non-competitive organisations (such as not-for-profit organisations or government administrations) the need for a systems strategy may be just as great, but unfreezing may be harder to achieve. In this situation, the unfreezing action might result from a change in government policy or from political pressure. In the United Kingdom, for example, the interest in strategic systems planning in the Health Service has increased because of the Government's emphasis on increased cost-effectiveness. For SNCF, the need to include information technology issues in corporate strategy was created by political pressure

to make the railways run profitably. Similarly, the political ambitions of government ministers may give rise to increased interest in information technology and strategic systems planning.

In his presentation to the Foundation Management Conference at Torquay in 1983, Calvin Pava described several changes in social attitudes and in the nature of work that act as unfreezing agents. For example:

— The validity of the hierarchical view of the organisation will decline. The person at the top may no longer have a complete understanding of the business.

— Various groups of skilled workers (power-supply technicians, air traffic controllers, radiologists, insurance brokers, physicians, lawyers, etc.) will promote the need for a professional, personal service as they attempt to find ways of preventing themselves being replaced by machines.

— The importance of time and space, as determinants of how work is organised, will decrease.

— Economies of scale will become less dominant.

— The nature of work will change, becoming less physical, more conceptual and more dependent on remote data and software.

— The meaning of productivity will change. Efficiency, in the form of machines and software, will be available to everyone. Effectiveness will become a competitive factor and will depend on qualitative rather than quantitative factors.

Competitive pressures always act as unfreezing agents, but they are stronger in some industries than in others. If they are slow to act, then systems management must be patient and must continue the scouting activities until either competitive pressures or some other unfreezing agent creates the right entry opportunity.

ENTRY

Once the scouting stage has been completed successfully, systems management will have created an opportunity to discuss strategic systems planning with top management. The difficulty at this stage is that top management may have a built-in resistance to any further involvement. The purpose of the entry stage is therefore to gain commitment by top management to a strategic systems planning study. Unlike the scouting stage, which is often very lengthy, this stage can be very rapid. Once top management has become comfortable with the idea of having a systems strategy, it is likely to want it quickly before the circumstances change. In our judgement, the entry stage is typically 80 per cent political and 20 per cent analytical.

The required activities at the entry stage are:

— Establishing the relevance and value of a systems strategy.

— Establishing the feasibility of carrying out the strategic planning study.

— Agreeing the scope of the strategy study.

— Gaining top management's commitment and support.

Establishing the relevance and value of a systems strategy

If a successful entry point has been established and top management is willing to discuss strategic systems planning, it is essential that systems management has something relevant to say. Establishing the nature of a systems strategy is difficult for the reasons identified in Chapter 1. It is often best to begin by discussing systems strategy in terms of its relevance and value to the organisation in general, and to top management in particular. It will also be necessary to reassure top management that the costs and risks associated with implementing the strategy are likely to be justified by the benefits. This cannot be finally determined until later in the study, but a prima facie case should be established.

An initial analysis of competitive forces (see Chapter 4) may suggest potential systems benefits that have not been appreciated before. And reference to competitors' activities may be a useful way of establishing the relevance of a systems strategy. Another way of demonstrating the value of a strategy is to show how existing problems at a tactical level dissolve within a clear strategic framework. If systems management can demonstrate that information technology is relevant to the organisation's overall strategy, top management will welcome the adoption of a strategic viewpoint of information technology.

If the relevance and value of a systems strategy have been established, it is probably best to avoid detailed or abstract arguments about what is or is not a systems strategy. Instead, we recommend the definition quoted in Chapter 1: a systems strategy is a general statement of the direction in which systems should develop over the medium-to-long term, with some indication of the resources required and the priorities for the application of those resources.

Establishing the feasibility of carrying out the planning study

Systems management must not only establish the relevance and value of the strategy, but also must demonstrate that it is capable of carrying out a strategic planning study. Factors that will concern

top management include cost, timescale, extent of management involvement, political impact on the organisation, and the use of a proven approach.

Emphasising that the trend is away from high-cost lengthy studies and towards shorter studies that require more management involvement over a shorter time, and which explicitly recognise and manage the political impact, will help to establish the feasibility of carrying out a strategic systems strategy study.

Agreeing the scope of the strategy study

The scope of the strategy study must be established and agreed, in terms of the parts of the organisation to be included, the extent of geographical coverage, the management levels to be involved, the technology to be considered (some or all of computing, office systems, telecommunications, etc.), and the types of application to be considered.

The emphasis of the strategy must also be determined. For example:

- —At Conglomerates Inc. the emphasis was on mainstream computing applications, with highest priority being given to a new inventory management system.
- —At KLM there was an organisation and management emphasis, with the computing and office automation resources in the engineering and maintenance division being brought within the control of the central systems function, and the highest priority being given to improved support for the central engineering and aircraft maintenance planning sections.
- —At Pfizer there was a technical emphasis, with a change from centralised mainframe services using conventional file structures to distributed computers using databases.
- —At BP Group (as described at the 1984 United Kingdom Foundation Conference at Cambridge) there was a management emphasis. BP established a group-wide strategy that required every operating company to have its own systems strategy, and all systems investment decisions to be commercially sensible and consistent with that strategy.

Gaining top management's commitment

The final activity in the entry stage is for systems management to obtain from top management a clear mandate to do the study. It must be clear to everyone affected by the study that the systems function has full backing from the top and that the exercise is recognised as being of strategic importance to the organisation.

The ICI case history illustrates the power of the critical success factors approach in gaining top-management commitment. In each of the studies carried out at ICI, every member of the top management team was interviewed individually for about two hours, and collectively for about two days in a strategy working group. This process led to agreement on their unit's mission, its business objectives, its critical success factors and the requirements for new or improved systems. It also generated the support and commitment required to maintain the momentum for the remainder of the study.

Having gained top management's commitment for the study, the first two stages of the Kolb/Frohman framework will have been completed. These initial stages are largely social and political in nature. It is now time to move on to the stages with a more analytical content.

CHAPTER 4

THE GUIDING FRAMEWORK — DIAGNOSIS STAGE

The diagnosis stage of the Kolb/Frohman model, together with the next two stages (planning and action) are equivalent to the moving process in the Lewin/Schein theory of managing change. The purpose of the diagnosis stage is to agree the objectives of the strategy and their relative priorities. During this stage, however, a lot of additional material is collected that will be required for the later stages. The diagnosis stage ideally should be rapid, so as to generate management momentum and to stay relevant to current needs. The activities at this stage are typically 80 per cent analytical and 20 per cent political.

Each organisation should carry out a careful diagnosis of its real needs for information technology support, and the applications that will make a real difference to competitiveness or organisational effectiveness. Unfortunately, there is no standard list of applications that an organisation should develop in order to exploit information technology and achieve strategic advantage. All organisations are different and each one has a unique set of needs.

In his presentation to Foundation members at Torquay, Calvin Pava suggested that all similar organisations will eventually install similar systems and equipment, and so any initial advantage will be short-lived. Those organisations that adapt these systems and equipment, however, rather than merely adopt them, will gain a strategic advantage. Anyone will be able to buy machine efficiency, but only the creative and skillful will be able to achieve management effectiveness.

We now describe two diagnosis methods that have grown in popularity since we published Report No. 34. They are competitive impact analysis and critical success factors analysis.

COMPETITIVE IMPACT ANALYSIS

Competitive impact analysis is more an approach to (rather than a formal method for) analysing the potential value of information technology in organisations. It has developed from the work of Michael Porter, Gregory Parsons and James Cash at the Harvard Business School. (See References 11 to 14.) They argue that information technology can have an impact at industry, company and strategy levels. A properly managed organisation should be aware of these potential impacts and should plan its activities accordingly.

At the industry level the impact can be felt in a variety of ways. For example:

- Information technology can assist in the creation of new products and services that compete with existing offerings within the industry. Thus, online databases are competing with published reference documents; it may cost less to access and search a database than to subscribe to a publication.
- Information technology can lead to the creation of new markets. Thus, the advent of home computers has created new markets not only for their manufacturers, but also for retailers, software writers and magazine publishers.
- Information technology can change product life-cycles. Thus, European and North American car makers have had to reduce by two years their new-product development times to be able to compete with the Japanese makers. And in the life assurance industry traditional forms of business are being superseded by new products based on the innovative use of computer systems.
- Information technology will change production economics. Historical economies of scale will become less pronounced because transaction costs will no longer be dependent on volume. Thus, General Electric's new Erie locomotive factory can handle ten different types of motor frame without manual adjustment. And most car makers can assemble 'customised' orders on the standard assembly line.
- Information technology can lead to a redistribution of the 'value-added chain' in an industry. Buyers, using industry-wide information about prices and availability, can force down the cost of the product, but they may be willing to pay more for reliable delivery. Thus, distribution companies without adequate dispatching and tracking systems may

be forced to become low-cost local operators, whereas distributors possessing such systems can offer national or even international services at premium prices.

All of these examples illustrate how information technology can modify existing industries and create new ones. An organisation that sees itself as operating in a particular industry should be aware of these potential industry-level changes, and how they may affect its business.

At the company level, information technology can influence the strategic competitive factors that determine the relative position of the company in its industry. Porter has defined these factors as the relations between a company and its suppliers, the relations between a company and its customers, the rivalries between companies within the industry, and the twin threats of substitute products and new operators entering the industry. Information technology can impact each of these factors in different ways and to different degrees.

Impact on supplier relations
The suppliers in an industry include the sources of raw materials, capital assets, finance and labour. Organisations can use information technology to help them 'shop around', thereby reducing the cost of supplies and their dependence on particular suppliers. For example, many banks have developed systems that give up-to-date information about the money in their control, and about the costs of the various types of finance. They can therefore improve the effectiveness of their investments and borrowings. Information technology can also be used as a substitute for supplies, such as labour, or to prolong the life of existing assets.

Impact on customer relations
An industry can be controlled by its customers if a few of them account for the majority of the industry's sales, or if the cost of changing from one supplier to another is low. Organisations can use information technology to introduce 'switching' costs that make it more difficult for a customer to change to an alternative supplier. The well-publicised case of American Hospital Supply is a good example of this strategy. This organisation has introduced online order-entry and inventory-management systems for hospitals. These systems certainly provide benefits for the hospitals, but they also serve to lock-in the hospitals to American Hospital Supply.

Organisations can also develop information technology systems that enable them to analyse the profile of their various potential markets in order to move to the high-profit, low-customer-power segments. The more-successful companies in the life assurance and general insurance industries are using information technology in this way.

Impact on the rivalry between companies
Rivalry between companies can be destructive, cooperative, or somewhere in between. Destructive rivalry can produce an apparant 'winner', but the effect on the industry may be to reduce its overall profit potential. For example, the intense rivalry between the North American airline operators, using information technology services such as flight information systems and seat reservation systems, has led to winners and losers but has also reduced the profitability of the industry.

By contrast, there is an increasing number of examples of information technology being used for inter-company cooperation. These include one bank's cash dispensing machines accepting other banks' cash cards, and the growth of industry-specific value-added network services such as Tradernet, which provides electronic links between food manufacturers and retailers in the United Kingdom.

Information technology is therefore causing companies to rethink the areas in which they will compete, and on what terms.

Impact on substitute products
Companies can use information technology not only to create substitute products themselves but also to create entry barriers that make it difficult for others to provide substitute products. Thus, electronic mail presents a threat to traditional operators in the courier industry, and the use of CAD/CAM systems has enabled established operators to react swiftly to the threat of competitive products in the motor and pharmaceutical industries.

Impact on new entrants to an industry
Again, companies can use information technology either to remove existing entry barriers so as to enter a new industry, or to create barriers to keep new entrants out of their existing industry. For example, Comp-U-Card has created a completely new order and distribution service that bypasses traditional store-based and mail-order retailing. And the existence of expensive but effective computer-based logistics systems in the distribution industry has acted as a barrier to new entrants.

Application of competitive impact analysis to strategic systems planning

As a result of its analysis of the five types of strategic competitive factors, each company should decide on the kind of commercial strategy that it should adopt, on the role that information technology should play in that strategy, and hence on the systems strategy that is required. It is important that the systems strategy should support the business strategy, not conflict with it.

Porter has suggested that there are three generic business strategies available to any company: cost reduction; product specialisation; and market niche. The cost-reduction strategy is aimed at reducing costs and prices and increasing market share and profitability. This strategy requires systems that will increase efficiency by reducing production and distribution costs and by increasing flexibility.

The product-specialisation strategy is aimed at providing a very flexible product design, manufacturing and delivery service, but at a premium price, so leading to increased profitability. The market-niche strategy is aimed at identifying specialised niches in the general market and offering tailored products at premium prices. Both of these business strategies require information systems to support market analysis, product planning and production control.

Competitive impact analysis forces a company to examine its relationships with its business partners. These relationships can be perceived as a value chain that runs from the company's suppliers, through the company itself, then on via the company's distribution channels to the customers. As one moves along the chain from supplier to customer, price becomes more important than cost, and then value becomes more important than price. Increasingly, as Paul Strassman has pointed out, value will be added by enhancing the information component of a product or service. (Every product and service has both a physical and an information component; at its most basic, the information component may simply be the physical dimensions of the product.) Using information technology to enhance the information component can have a much greater competitive impact than using it to reduce the cost of the product.

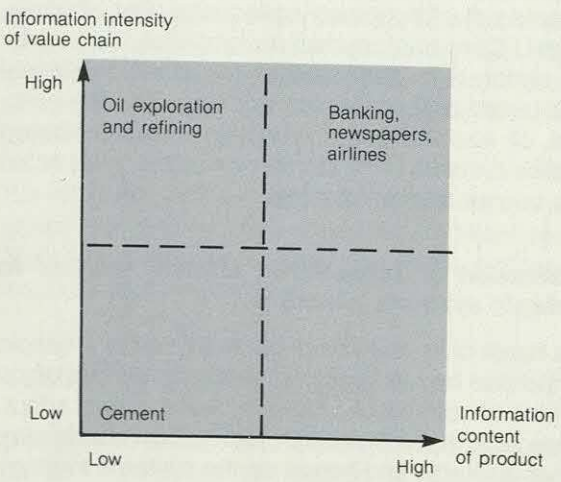
In the diagnosis stage of strategic systems planning, therefore, planners should assess the potential impact of information technology both on the strategic competitive factors and on the value chain. The following steps will help planners to diagnose these opportunities in a rigorous, controlled way:

— Determine how important information technology is, and may become, within the planning timeframe, both for the products and services offered and for the processes used to develop, manufacture and deliver them. Position the company and its rivals on an information-intensity matrix, as shown in Figure 4. Beware if other companies in your industry are nearer to the top righthand corner, because they are probably using technology to achieve a competitive advantage over their rivals.

— Assess the relative importance of each of the five strategic competitive factors in the industry, and predict the likely impact of information technology on each of them. Position each factor on a grid of competitive importance versus information technology impact, as shown in Figure 5. Factors of high competitive importance and on which information technology is likely to have a high impact are those of greatest significance within the systems strategy.

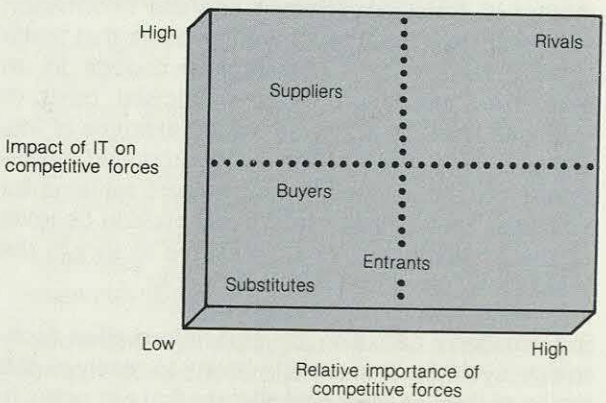
— Review the activities that contribute to the company's value chain. Identify those activities that either bear the highest cost, or contribute the most to product differentiation, or have the highest concentration of links with other activities both inside and outside the company. Decide whether information technology could benefit any of these activities.

Figure 4 Information-intensity matrix



(Source: M. E. Porter and V. E. Millar)

Figure 5 Technology impact on competitive forces



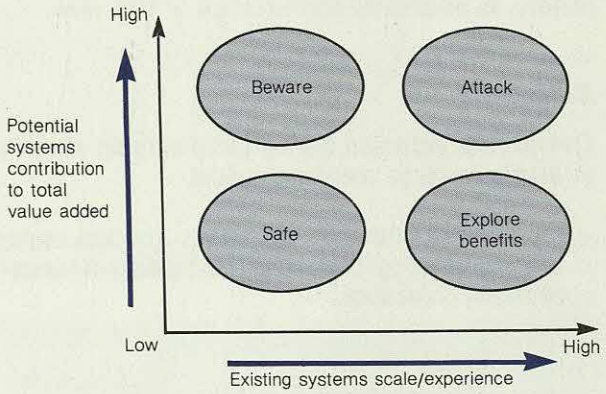
(Source: Dr. Gregory Parsons, Harvard Business School)

—Rank all of the information technology opportunities in terms of their likely impact on competitiveness and the investment needed to achieve that impact.

When these steps are complete, the objectives for the systems strategy will be clearly stated and prioritised. According to Cash (see Reference 14) the difference between strategic winners and losers is that winners look for and develop new high value-added applications, whereas losers continue to amend and augment their obsolete low value-added applications.

Cash also suggests that it is useful to position the company on a matrix that relates the potential systems contribution to value added with the existing systems scale and experience (see Figure 6). Companies in the bottom lefthand quadrant have little to gain from information technology investments. Companies in the bottom righthand quadrant already have substantial investments in, and experience of, using systems, but there is little potential for systems to contribute to value added. These companies should explore new ways of exploiting their strong position. Companies in the top lefthand quadrant should beware of competitive attack. Their systems have a high potential, but these companies have little investment in, or experience of, systems, so they are not well placed to realise the potential. Companies in the top righthand quadrant should look for opportunities to attack their competitors because the potential of systems is high and they have high existing investments in, and experience of systems.

Figure 6 Positioning your organisation's approach to strategic systems planning



(Source: Dr. J. I. Cash, Harvard Business School).

CRITICAL SUCCESS FACTORS ANALYSIS

Although we described the critical success factors (CSF) approach in Foundation Report No. 34, we mention it again here because it has developed in ways that make it much more effective. As originally proposed by Jack Rockart, it was an interviewing and analysis method that concentrated on ". . . the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organisation" (see Reference 15). Now, however, Rockart and his co-workers have turned the CSF interviews into the preliminary step of an approach in which the key is a management workshop. At the workshop, members of the organisation's management team review and discuss their individual CSFs and arrive at a consensus on the organisation's CSFs. Having reached agreement, they can then discuss the contribution that information technology might make towards achieving these CSFs (see Reference 16).

During the research for this report we met with Jack Rockart and discussed the method, its strengths and its weaknesses. He identified the following strengths:

—The method is easy to understand because it is concrete, not abstract.

—The method focuses on the important issues, rather than on those that are merely necessary, and it avoids getting bogged down in today's problems or in tomorrow's uncertainties.

—The management workshop helps bring into the open factors that are implicit and personal, and makes them explicit and shared. It uses peer-group pressure to achieve agreement and commitment.

—The workshop provides a forum for revealing political interests and for building political coalitions to support the final strategy.

Rockart accepts that the method is not comprehensive, but he believes it is a valid approach because it focuses on the ten per cent of systems activity that contributes 90 per cent of systems success. Also, the results of the method are only as good as the perceptions of the managers taking part in the interviews and workshop. Even so, the process is always very beneficial for those involved in it.

As we said in Report No. 34, the method requires a skilled interviewer to help the individual manager identify his job purpose, objectives and CSFs. It also requires a skilled catalyst during the workshop, whose job is to challenge managers' assumptions, encourage them towards a consensus, and provide outside knowledge and experience.

Butler Cox has used the CSF approach very successfully in several consulting assignments. Our experience has been very similar to Rockart's.

Managers like the approach because it helps them to achieve a deeper understanding of their business and their own job, and it uses their time effectively. The experience of ICI, as described in the case history, is additional confirmation of this view.

SUMMARY

Overall, the activities during the diagnosis stage of strategic systems planning should:

— Identify the strategic objectives and the opportunities for using information technology in support of those objectives.

— Identify the strengths and weaknesses of the organisation with respect to information technology, and the extent of the available resources.

— Identify the 'political' aspects of the situation: the interested parties, their attitudes, and the scope for possible coalitions.

— Establish the criteria that will be used at the evaluation stage to judge the progress of the strategy in terms of its direction, rate, sequence and use of resources.

— Gain agreement from top management on the objectives of the systems strategy and their relative priorities.

CHAPTER 5

THE GUIDING FRAMEWORK — PLANNING STAGE

In the planning stage the objective is to gain agreement for a selected course of action. We regard this stage as being equally analytical and political. The activities at this stage are:

—Preparing a vision statement.

—Generating options.

—Evaluating the options and selecting the best.

—Gaining agreement for the selected course of action.

PREPARING A VISION STATEMENT

One of the words currently fashionable in the system planner's vocabulary is 'vision'. It appears frequently in the literature and several of the people we spoke with during our research talked about their strategic vision and their vision statement. A vision statement is a specific picture of the desired future; it is tangible, vivid and highlights specific goals and opportunities.

We believe that it is useful to prepare a vision statement because it can help to keep the planning objectives relevant and in proper focus. However, the difficulty arises in trying to formulate a vision statement that is concerned with information systems but is stated in business terms. Too often systems planners fall into the trap of visualising a future that is highly desirable for the technicians but is largely irrelevant for top management.

We believe that the visions described in the Pfizer and Kodak case histories suffer in this respect. Figure 7 shows a 'model' vision statement quoted by Peter Keen (see Reference 17). He recommends that the vision statement should be prepared by a group comprising "business thinkers, systems thinkers, opinion leaders and catalysts".

Figure 7 A model vision statement

The vision of Company XYZ

We see ourselves in ten years in an industry where a number of existing firms will have gone under. Only the ones that really get their operations and costs under control will survive. We do not expect to be innovators but to market a small line of high quality products.

We will be a leaner organization, more reliant on automation in all areas. Our people are more skilled technically than in most companies like ours and work together well. We have a reputation for making tough decisions and being a good firm to work for. These are the strengths we must build on: when we consider being 'more productive' we must achieve improvements in our smooth organizational machine through being technically efficient and well run with good staff relations and communications within the company . . .

Our key critical success factors are quality assurance and cost control. Our critical failure factor is how we handle the painful necessity of cutting head count: we must not damage the morale of our people but we must hold our costs down, *starting now.*

New office technology for us means integrated information management. We have too many paper chasers, people tracking down records, getting answers to customer inquiries, cross-checking between marketing and finance, production and warehousing and so on. In ten years' time we must be an organization of skilled people where all documents are electronically created, distributed and accessed. Virtually all our people will, by then, be doers and they will not waste time chasing paper. They will be able to get information immediately about the guts of the business: customers, products, production and delivery. We see new office technology changing the way we handle our work flows. We will use the workstation instead of administrative staff to keep tight information control with no spare bodies shuffling files.

(Source: Peter Keen)

GENERATING OPTIONS

Any planning activity is basically a process of generating options and then reviewing them to select the best. In strategic systems planning the process involves deciding who should receive the available systems resources, to which of their business activities those resources should be applied, when their requirements should be met, and how the technology should be applied. The first two of these components will have been determined during the diagnosis stage. The various options for satisfying some or all of the requirements must now be considered.

The decision conferencing method

One approach to this task is to use the decision conferencing method, developed by Dr Larry Phillips, of the Decision Analysis Unit at the London School of Economics. A typical decision conference is a two-day workshop attended by the ultimate decision taker and the various 'problem owners' who have an interest in the decision, together with a 'facilitator'.

The first task is to agree on the problem to be solved, and the participants then discuss possible options that may be worth considering. Next, they discuss the criteria that they could use to evaluate the options and they make a subjective judgement about these. For example, if the criteria were benefits and costs, they would judge the relative benefit and relative cost of each option on a scale of 1 to 100. One option might have benefits and costs of 90 and 65 respectively, while another option might have benefits and costs of 75 and 30 respectively.

The facilitator uses a portable computer and a large tele-projection screen (so that everyone can see the results) and displays a chart showing the positions of the options on a benefits versus costs matrix. Usually there is then some argument as the participants debate and refine their judgements. Often they do not like the results and the facilitator urges them to explore why this should be. This may then lead to the addition of other options or different evaluation criteria. Finally, they agree on the option that best meets their criteria.

Larry Phillips believes that the strengths of the decision conference approach are:

— It recognises that generating and assessing options is a subjective, intuitive activity. A computer cannot be used to work out the right answer, but it can be used to help the decision takers explore the issues in a structured and controlled way.

— It involves all the people with an interest in the decision, and so helps to create the kind of political coalition required to make the chosen option work.

— It provides a quick and easy way to test the sensitivity of the chosen option to small changes in the various judgments.

— It forces the participants to bring their preferences into the open and justify them in front of their peers. (In this respect the method is very similar to critical success factors analysis.)

Butler Cox was involved with a decision conference in an insurance company that was incurring very heavy costs because it was supporting too many bespoke underwriting policies. The conference showed very clearly that most of the profit was made on a small number of basic policy types and that the large number of bespoke policies contributed very little. The company subsequently changed its marketing approach in order to concentrate on the basic policy types.

Methods for generating technological options

What other approaches are available to systems planners who have to generate technological options in the light of the vast range of information technology developments? The material published in the Foundation Report Series provides an overall input to this process. In addition, Butler Cox has developed a technology tracking method that enables systems planners to judge which developments are now, or are likely to be, relevant to their business. The steps are:

— Review the whole technological field and select all the developments that might have application within the organisation.

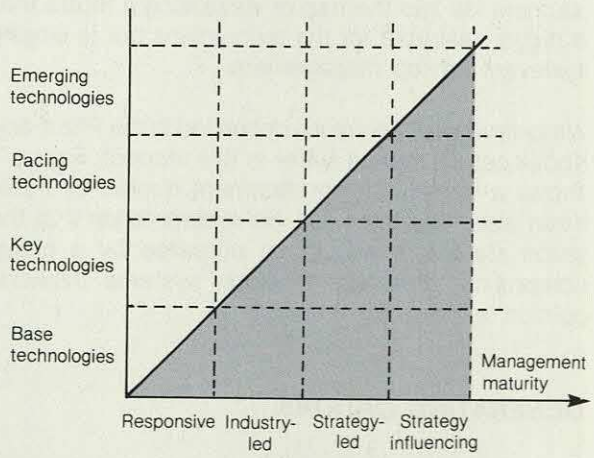
— Estimate today's maturity for each of the technological developments, using four broad divisions (emerging technology, pacing technology, key technology, and base technology) and position each development on the chart shown in Figure 8 opposite.

— Forecast how each development will mature over the next five years and draw the likely change of maturity on the graph, as shown in the figure.

— Pick out those developments that seem likely to become relevant during the planning time-frame and track these carefully. Follow their rate of development and also their early uses, especially by competitors.

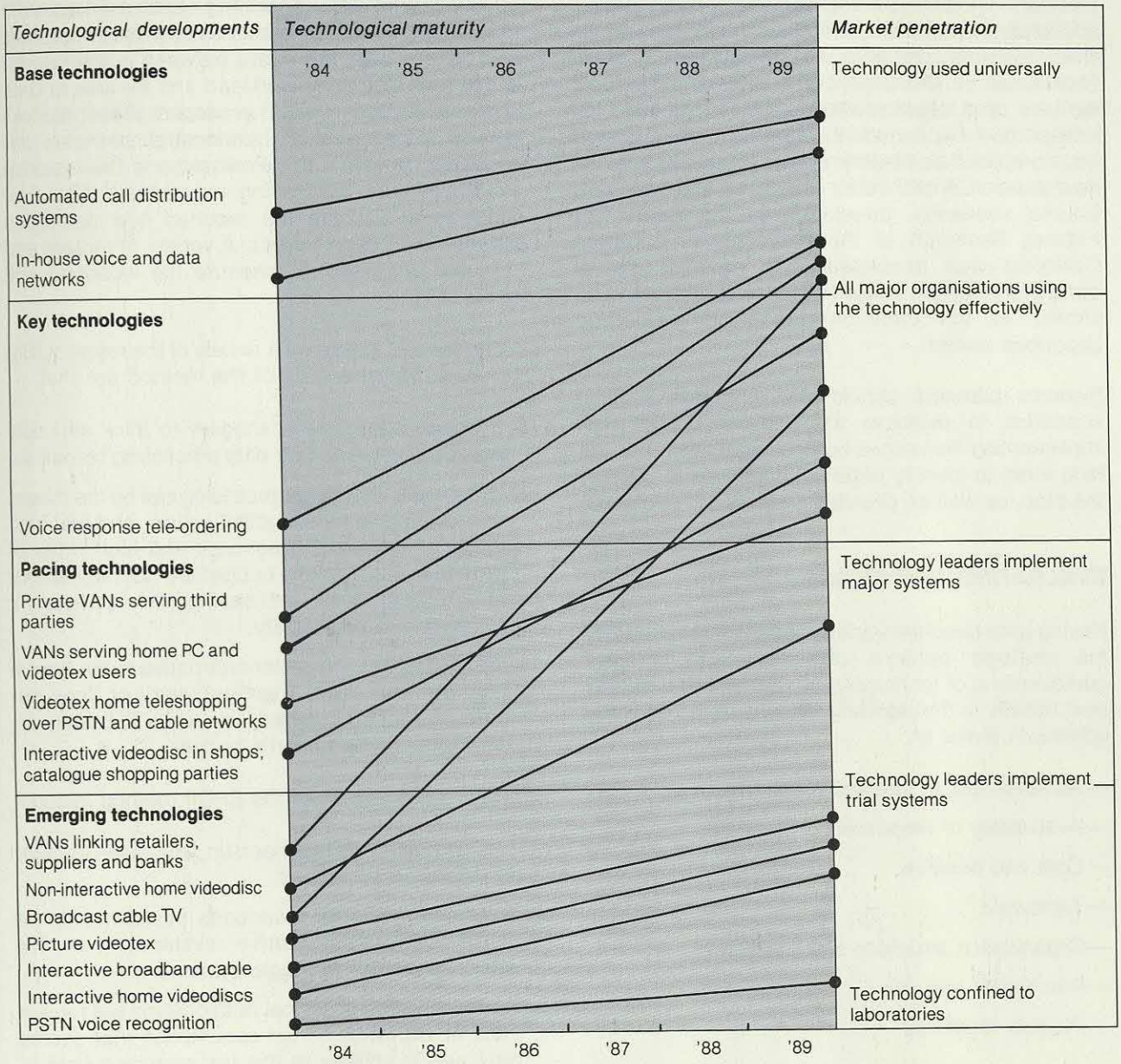
Another factor to consider when selecting from the technological options is the ability of the organisation to manage a chosen technology. There will be a relationship between technological maturity, as described above, and the systems management maturity and experience required to harness that technology. Figure 9 shows that relationship, arbitrarily, as a straight line. Management maturity is shown in terms of the role of the systems

Figure 9 Information technology and management maturity matrix



(Source: Butler Cox).

Figure 8 Tracking changes in technological maturity



(Source: Butler Cox)

department within the organisation. At its least mature and influential the role is purely responsive. Its stages of maturity go from being industry-led to being determined by the organisation's business strategy and, finally, to being a determining factor of that business strategy.

The value of the chart shown in Figure 9 is that it helps in deciding whether a particular systems requirement should be satisfied by established or new technology. The area below the line defines the technological options that are available to a systems management at any particular level of maturity. Thus, at one extreme, a 'responsive' department should only use base technology. However, that does not mean that it should use that technology without thought or imagination. It should adapt as well as adopt. At the other extreme a 'strategy-influencing' department should be developing and exploiting the base technology, controlling and improving the new applications of key technology, encouraging pilot tests of pacing technology, and exploring and sponsoring the emerging technology.

The July 1985 edition of EDP Analyzer was devoted to the problems of carrying out strategic systems

planning against a background of technological uncertainty. It suggested that strategic systems planners should act like battlefield commanders speculating on what the enemy might do. In the same way, systems planners should speculate about technological developments, and should 'post sentries' that could provide a warning in case the unexpected happened. Furthermore, they should have prepared contingency plans for coping with the new situation. A method for developing and evaluating futures scenarios, developed by the Center for Futures Research at the University of Southern California was described. This method uses a computer program called Interax, and appears to be similar to the decision conferencing method described earlier.

Systems planners should also generate political scenarios to evaluate the political impact that implementing the various options might have. This will help them to identify potential coalitions to support the plan, as well as possible pockets of resistance.

EVALUATING THE OPTIONS

Having generated the various options that will satisfy the strategic systems objectives with different combinations of technology, resource and time, the next activity in the planning stage is to evaluate the options in terms of:

—Achievement of strategic objectives.

—Availablility of resources.

—Cost and benefits.

—Timescale.

—Organisation structure and leadership.

—Practicality and risk.

—Political feasibility.

This evaluation is always difficult to carry out because one is dealing with an unknown future. Sometimes there is an over-emphasis on costs and benefits, especially if top management is inexperienced in strategic planning (see the SNCF case history, for example). On balance, our view is that investing in information technology is similar to other strategic investment — it is a question of judgement rather than of pure accounting. We believe that systems planners should avoid placing too much emphasis on costs and benefits during the first planning study. As the organisation learns about the value of planning, the cost and benefit questions will come to be seen in their proper context.

One approach to evaluating costs and benefits in a rational way has been developed by IBM Canada and is known as Executive Planning for Data Processing (EPDP). The method is a complex mixture of arithmetic, computer modelling and management judgment. The first phase involves finding a relationship for the past five years between actual growth in the total company workload and the use of data processing resources. The second phase involves finding a reasonable relationship between the expected growth in the workload and the resulting growth in data processing expenditure. The final phase is to allocate the required new resources between user departments. A variety of factors and formulae are used to measure the workload and resources.

In our opinion, based on a review of the relevant IBM literature, the strengths of the method are that:

—It encourages user managers to think seriously about the value of their data processing resources.

—It illustrates that data processing can be the means of providing high productivity gains, and that high levels of systems investment and high rates of growth in the systems budget are not necessarily inconsistent with increasing the company's revenue and profitability.

—It provides a much better alternative to the typical "ten per cent more than last year" or "one per cent of total company revenue" bases for determining the systems budget.

Possible weaknesses of the EPDP method include:

—It is complex and mechanistic, and relies on a lot of hidden assumptions.

—It is more valid for workloads based mainly on traditional administrative systems than for effectiveness or strategic systems.

—It assumes that historical relationships will remain valid in the future — an assumption that seems particularly unlikely in the fast-changing field of information technology.

Nevertheless, according to IBM, those who have used EPDP like it. And it certainly seems to provide a believable justification for the vast increases in IBM equipment that the method often reveals will be necessary for commercial survival.

GAINING AGREEMENT FOR THE SELECTED COURSE OF ACTION

The final step in the planning stage is to gain agreement from top management that the selected option represents the best course of action. It is essential to gain top management commitment and support at this point if the plan is to be implemented

successfully. If top management has been involved in the prior scouting, entry and diagnosis stages, and if the politics of the situation have been handled well, then there should be little difficulty in gaining this agreement.

Planning is not the wholly rational, analytical activity that is frequently described in textbooks and articles. In practice, it is typically a reactive, recursive, continuing discussion between the interested parties. It is not what James Martin calls an 'engineering' activity that uses formal disciplines and precise techniques to achieve clearly discernible aims. The really important thing about planning is that it should involve the people being planned for, obtain their identification with the strategic objectives, and get them moving in the right direction. It is closer to what Warren McFarlan calls "planned clutter".

CHAPTER 6

THE GUIDING FRAMEWORK — ACTION STAGE

In the action stage the aim is to convert the general sense of strategic direction and movement created during the diagnosis and planning stages into a set of tactical goals with clearly assigned responsibilities for achieving them. Until this key activity has been carried out the strategy is vulnerable. If the plans do not motivate and convince the people affected by them, they may opt out and stand by to watch as the planners gradually drown in their own plans.

The specific activities involved in this stage are:

—Selecting an implementation approach.

—Adopting an appropriate management style and structure.

—Forming coalitions.

—Defining tactical goals and assigning responsibility for their achievement.

The action stage is almost entirely political because it is concerned with getting things to happen through the involvement of other people.

SELECTING AN IMPLEMENTATION APPROACH

There are two broad approaches to implementation — from the top down and from the bottom up. The top-down approach assumes that the organisation is homogeneous and that top management's goals and values are shared, or at least accepted, throughout the organisation. Planning and implementation are then a rational, structured series of activities that descend through the organisation, at increasing levels of detail, in a fully controlled way. This approach is conceptually attractive because it appeals to people's sense of reason and order. It is especially appealing to those who see implementation in terms of systems and hardware and prefer to ignore the existence of the people who will work with those systems. However, the top-down approach can be unwieldy if the strategy requires a major change of direction. As we explained in Chapter 1, strategic objectives tend to be modified during implementation, with the result that the strategy as implemented is different from its original plan. The top-down approach makes it harder to prevent this happening.

The bottom-up approach implements the strategy piece by piece. If one piece works successfully then the next is attempted. This approach is pragmatic, incremental, and it relies on the involvement of the people affected. The drawback with the bottom-up approach, however, is that it tends to be random, unplanned and reactive.

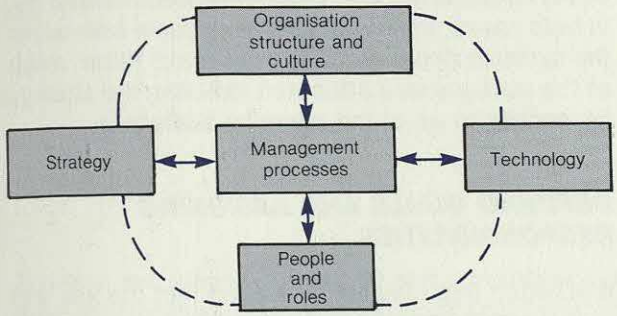
The most practical approach, in our view, is top-down planning followed by bottom-up implemetation. In this way, a series of small steps, which are clearly related within the strategic framework, can be carried out in order to produce a discernible movement in the desired direction.

During our research, we discussed the problems of implementing a systems strategy with a very experienced systems director in New York. He runs the North American operations of a multinational company based in Great Britain. In his experience the difference between American and British managers lies in the ability of American managers to turn plans into action. British managers tend to be over-cautious, over-prudent, over-analytical. As he put it, "They can't get off their butts".

ADOPTING AN APPROPRIATE MANAGEMENT STYLE AND STRUCTURE

Information technology has the power to influence and also to support an organisation's overall strategy. As that strategy evolves and changes, so the organisation structure and the management processes also should evolve and change. Jack Rockart and Michael Scott Morton have suggested that Leavitt's model of the four social forces in an organisation, which we showed as Figure 1, should be developed further to take more account of the impact of technology (see Reference 18). Their revised model is shown as Figure 10. The dotted line around the outside of the model is a 'permeable membrane' that allows the five internal forces different amounts of exposure to the two external forces provided by the socio-economic environment and the technological environment. The organisation's strategy and its ability to absorb technology are greatly affected by the external

Figure 10 Leavitt's Diamond as developed by Rockart and Scott Morton



forces, whereas the structure and culture, the individuals and their roles, and the management processes react, as Leavitt suggested, to absorb the impact. Planners must recognise that any significant change in systems strategy will cause a change in the organisation's structure, the roles of individuals and the management processes.

Rockart and Scott Morton believe that, until recently, information technology has caused little change in these areas. To date, information technology has been harnessed largely to computerise the paperwork, originally for accounting and administration, and subsequently for operational activities. Today, information technology is recognised as a strategic factor and, as a result, it is causing much more fundamental changes in management style and structure. Consider the development of departmental databases that are opening up the access to data, for example. Or the way in which the use of centrally controlled telecommunications networks is changing the relative power and autonomy of the various parts of the organisation. Or the ways in which electronic mail services are changing the communication and commuting patterns of managers. In addition, systems linking different organisations are changing employee-categories and skills, and also organisation structure (see Reference 19).

Different management styles are needed at different stages of the technology assimilation process. Technology assimilation passes through four phases (see Reference 20):

- —Identification and initial assimilation, concerned with exploring a new technology and how to apply it.
- —Experimentation and learning, concerned with making potential users aware of the new technology and of possible applications
- —Control, concerned with controlling the new applications and improving their efficiency and effectiveness
- —Technology transfer, concerned with developing and exploiting the now well-understood technology, and transferring it to other applications.

As we noted when discussing technology options, all four levels of assimilation can, and should, be found at any one time in large, mature organisations. The different management styles required to develop and control the assimilation must be recognised. The first two phases are concerned with exploring, forecasting, tracking, assessing, learning and testing. The latter two phases are concerned with exploiting, controlling, improving and consolidating. James Cash and Poppy McLeod (an associate of Cash at the Harvard Business School) argue that most organisations are familiar with the problems of managing activities in Phases 3 and 4, but are less well-equipped for Phases 1 and 2. They propose that organisations in which information technology has high potential should create an "emerging technology group" within the systems department. This group should have a structure and management style and controls that are different from those appropriate to Phases 3 and 4 (see Reference 14).

It is also important that the style required to manage the technology should not conflict with the overall management style in the organisation. Thus, a company with a cost-reduction business strategy would probably have a tight management style, with a high degree of standardisation and with close attention being given to cost and production variances. By contrast, a product-specialisation or market-niche strategy would require a looser and more-responsive management style, with close attention being given both to customer service and to response to market opportunities.

The final factor to consider in adopting an appropriate management style and structure is the selection of the leader who will be responsible for converting strategy into results. We have already said that during the entry stage the manager of the strategy study must have credibility with, and the trust of, top management, and that these attributes are more important than technical skill. The balance of required skills changes during the action stage, and the ability to make things happen by team building and coalition forming becomes crucial. Implementation must be led by a general, not coordinated by a staff officer.

FORMING COALITIONS

One of the keys to successful action is to harness the managerial and political interests of the various parties affected by the strategic systems plan. Experienced systems staff, with well-developed analytical skills, may find it difficult to accept the idea

that success depends more on identifying possible coalitions and negotiating tradeoffs between the parties than on rational planning and action. But experienced managers know that this is often the case. If the manager responsible for implementation does not have the necessary skills, he may have to call on the services of a 'fixer', with the authority and resources to make things happen.

If the organisation is in a crisis, or if the strategy will bring obvious benefits to everyone affected, there may be few problems with implementating the strategy. More often than not, however, the manager responsible for implementing the strategy should expect resistance to change, and be prepared to counteract the damping effect of Leavitt's Diamond (see Chapter 1).

Peter Keen has listed the typical resistance tactics that can be expected (see Reference 2). These include:

—Lay low, do not cooperate.

—Rely on inertia to prevent things from happening.

—Keep the situation complex, vaguely defined, hard to coordinate.

—Minimise the implementer's legitimacy and influence.

—Exploit the implementer's lack of inside knowledge.

The responses to these tactics include:

—Making sure there is a contract for change (see Chapter 3).

—Seeking out resistance and responding to it.

—Becoming an insider and building personal credibility.

—Identifying political interests and potential coalitions.

—Coopting users early on.

These aspects of managing change can be observed in the Kodak and Pfizer case histories. Interestingly, in both cases, the main resistance came from within the systems department. In the case of Pfizer, much of the success was attributed to selling the strategy personally to all of the planning audiences.

DEFINING GOALS AND ASSIGNING RESPONSIBILITIES

We began this chapter by stating that the key aim of the action stage is to convert the general sense of strategic direction and movement into tactical goals with clearly assigned responsibilities for their achievement. This is the stage at which the abstract strategy becomes concrete. In the KLM case history, the plans included a mix of short-term and long-term actions. The former were designed to maintain user interest and the credibility of the systems department during the time that was needed to install the increased resources.

Successful implementation depends on the plans being both legitimate and specific. Plans must be legitimate in the sense that their basis must be acceptable both to users and managers. This can be achieved by involving both parties in the planning process. Plans must be specific rather than general, so that those affected know what will be involved and how they will be affected.

To take the example of KLM again, one of the strengths of the Alloway methodology was that the plans that were developed from the survey results were both legitimate and specific.

At the end of the action stage, the 'moving' process (in terms of the Lewin/Schein theory of managing change) will have been completed. All that remains is to refreeze the situation.

CHAPTER 7

THE GUIDING FRAMEWORK — EVALUATION AND TERMINATION STAGES

The final two stages (evaluation and termination) in the Kolb/Frohman model can be described together because they are concerned with rounding-off the planning process. In terms of the Lewin/Schein theory of managing change, these two stages are equivalent to the refreezing process, during which the change is consolidated and institutionalised. The evaluation and termination stages may be brief, but their importance should not be underestimated because they ensure that the strategy is implemented in the light of the organisation's changing needs.

In the evaluation stage the key activity is to make necessary adjustments, either to the strategy or to its implementation, in order to maintain the validity of the strategy. In our view, evaluation is usually almost entirely a political activity.

The activities at the evaluation stage are:

- Reviewing the strategic objectives in the light of any changes in business activities.
- Reviewing the strategy in the light of developments in information technology, of any changes in objectives, and of progress with implementation.
- Reviewing the implementation in terms of progress towards the strategic objectives.
- Making any necessary adjustments.

It is just possible that no adjustment will be necessary, in which case the next (and final) stage would be termination. In practice, some adjustment will nearly always be necessary, with a resulting feedback into the diagnosis or planning or action stages, and a repeat of the cycle from that stage. Typically, strategic systems planning will never actually reach the termination stage, because inevitably there will be a need to recycle from the evaluation stage to some earlier stage. The planning process then becomes absorbed into the regular activity of strategic systems management.

The termination stage will be reached only in the unlikely event of the planning process being either a total success, or a total failure. Total success implies that no further planning activity is required for the time being, and the termination stage consists merely of tying up the loose ends. Alternatively, if the planning process has failed and there is no point in continuing, the process of implementing the strategic systems plan will be aborted.

Extending the strategic systems planning process by recycling to earlier stages should be seen not as an indication of failure, but as a positive contribution to organisational learning.

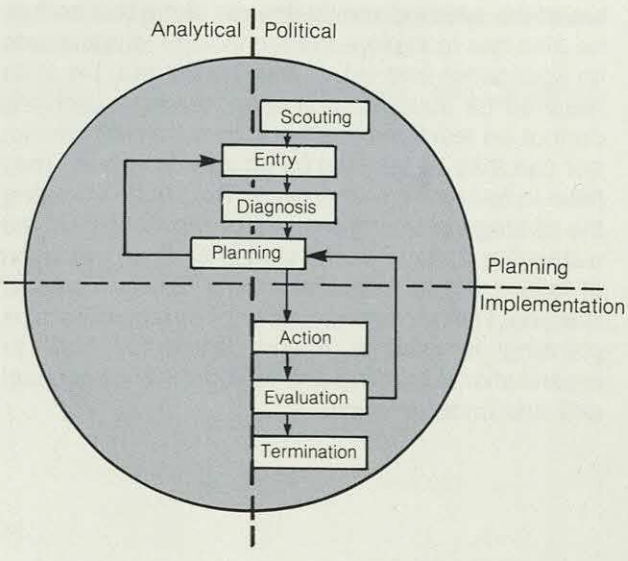
Information technology differs markedly from other types of technology in terms of the type of organisational learning involved. Industrial technologies require periodic training, with repetition used to reinforce the lessons. Intellectual technologies require ongoing experiential learning, rather than periodic training. The learner not only has to understand the rules governing the use of the technology, he also has to explore the technology to appreciate its application and value. This implies that the skills required for successful strategic systems planning cannot be learnt from a book or a training course, nor can they be injected by an outside expert. They have to be learnt by experience. This is why extending the strategic planning process by recycling from the evaluation stage to earlier stages is not an indication of failure, but an essential aspect of organisational learning. The discipline imposed by strategic systems planning is itself a major contributor both to organisational learning and to improved managerial skill and understanding.

CONCLUSION

In Chapter 2 we described the Kolb/Frohman model and showed (in Figure 3) the stages of the model superimposed on our representation of the planning domain. We now present in Figure 11 an elaboration of the previous figure, taking account of the balance between the analytical and political emphases for each of the seven stages defined by the model. We have positioned the box representing each stage of the model to the right or left of the analytical/political axis accordingly. This revised figure shows clearly that the crucial activities that have to be performed well take place on the political rather than the analytical side of the planning domain.

We believe that the model provides a useful framework for strategic systems planning and helps to clarify some of the comments made to us during our research. One system director told us that the real keys to successful strategic systems management are the social, political, and behavioural aspects. Good planning adds some detail and consistency but it is not a crucial factor. Another systems director said that the ingredients of success are enthusiasm, belief in the value of the service provided, good communications with users, careful planning at the detailed level, and a clear vision of where you are going.

Figure 11 The Kolb/Frohman stages of strategic systems planning mapped onto the domain of strategic information management



In writing this report we have deliberately tried to free ourselves from the conventional attitude towards strategic systems planning, in order to present an alternative approach to the subject. We have argued that, although there is certainly a place for fact-gathering and analysis, these activities form a relatively minor part of the whole process and they are certainly not the most crucial nor the most difficult part. Instead, much greater attention needs to be given to the 'soft' skills such as forming political coalitions and smoothing away resistance to change. Most systems staff are badly prepared, in terms of aptitude and experience, to exercise these soft skills successfully because their careers have developed in an environment that placed a premium on the 'hard' skills of analysis, design and hard-nosed project management.

What can they do to improve their performance? First, they should consider the main message of this report and assess its relevance to them. If they accept its validity they should consciously adopt a boardroom point of view and a more political approach to their work. This does not mean that they should suspect ulterior motives behind every action, nor that they should behave in a deliberately obtuse way. It does mean that they should recognise that everyone has a political side to his character, that people never behave in a wholly logical way, and that the political characteristics deserve to be recognised.

Finally, we believe that the ultimate result of successful strategic systems planning and implementation is that it will cease to be regarded either as a chore, or a project, or a single task, or even as a periodic process. It will be recognised as a continuous activity — the very essence of strategic management.

APPENDIX

CASE HISTORIES

CONGLOMERATES INC.

This case history describes a succession of strategic systems studies carried out during the 1970s, none of which produced lasting benefits.

In the late 1960s Conglomerates Inc. (a pseudonym for a North American corporation) operated on a worldwide basis with divisions in the primary products, manufacturing and financial services industries. It was a highly centralised group, with a large head-office staff. Some parts of the business were profitable, others were not. In 1971 the group decided to decentralise into autonomous divisions. Nevertheless a large corporate staff was retained, and this included an information systems department.

Division A, a manufacturing division with factories in North America and many other countries, decided to adopt a cost-reduction strategy in a bid to increase its competitiveness and its revenues. It was already a heavy user of computer systems and it believed that further computerisation would support its chosen strategy. Several companies within Division A had their own systems departments, and there was also a systems function at the division's world headquarters.

A new systems manager was recruited for Division A's North American company from the corporate systems department. His first priority was to rationalise the network of data centres that the company had inherited from the previous organisation. This led to savings of several hundred million dollars in personnel, space and equipment, and created a good impression with the company's top management. As a consequence the company's chief financial officer was very sympathetic to further computerisation and a planned approach and so, with a little encouragement from IBM, the company embarked on a Business Systems Planning study.

The study began in January 1975. During Phase 1, the study team consisted of the divisional assistant general manager, the assistant systems manager, an IBM consultant, and systems staff seconded as required. This phase lasted for six weeks and was a full-time job for each of the team members. They reviewed the company's business activities in order to gain a clear understanding of the business and to identify any problems with, or opportunities for, information systems. Phase 1 ended with a presentation to the company's top management, who agreed that the study should continue.

In Phase 2, six project teams were set up, one for each main function in the company. Each team consisted of user and systems staff, who worked for nine months, following up the systems opportunities identified in Phase 1 and preparing specifications of requirements. The teams identified a wide range of new applications. The biggest of these was a major inventory management project that would have led to savings of $115 million in inventory over five years, but which required an investment of $15 million.

However, many of these plans were never implemented. In March 1976, corporate head office initiated a major review of the whole business, using a well-known firm of management consultants. The consultants categorised Division A as a 'cash cow', and a new company president was installed with the brief to retrench, cut costs, and deliver the cash. One of his first acts was to terminate the BSP study. He was prepared to authorise only those projects with a payback period of no more than six months. These included several that had been identified in the BSP study, but the inventory project was scrapped.

The North American company's systems manager believes that the value of the BSP study was that it identified opportunities and high-profile applications, and it helped to consolidate good relations with the company's top management. However, its results depended on the company's commercial strategy — a strategy of growth through cost reduction led to one set of applications, while a strategy of retrenchment led to another.

In January 1978 the systems department at Division A's world headquarters invited Nolan Norton to carry out a strategy study. The scope of the study included North America but the emphasis was on rationalising systems services in the various European operations. The North American company was not able to prevent this study being carried out but, given its great

autonomy and the attitude of its new president to systems, it offered minimum cooperation.

Nolan Norton analysed the complete applications portfolios of every company in the division, and positioned each company on its six-stage growth curve. The study also identified missing applications or missing links between applications. After 15 months Nolan Norton presented its recommendations to the top management of each company and gained approval to proceed to the implementation stage. However, in February 1979 a new chief financial officer was appointed at the division's world head office. He changed the consultants, abandoned the Nolan Norton recommendations, and started a manufacturing control project that had originated in the technical department and had not been recognised in either the BSP or the Nolan Norton study.

Division A's North American systems manager believes that the value of the Nolan Norton study was that it led to improved relations between Division A's head office systems department and the management of the operating companies. Also, positioning each company on the six-stage growth curve provided a useful way of thinking about the present and future role of systems. The study did lead to a rationalisation of computing facilities in the European companies, which was one of the original objectives, but it was not very effective in identifying required applications.

In October 1978 the corporate systems department carried out a critical success factors study within the corporate head office, working closely with the corporate strategic planning department. The study was completed successfully but the results were never implemented because implementation depended on the cooperation of the divisions, who had not been involved in the study. Eventually, the influence of the corporate systems department diminished and its efforts were increasingly directed at the corporate head office, with the systems activities of the divisional companies becoming completely autonomous.

SOCIETE NATIONALE DES CHEMINS DE FER FRANCAIS (SNCF)

SNCF is a public utility, responsible for the transport of people and goods by rail throughout France. It employs some 245,000 staff and is organised into 13 divisions, one of which is the data processing division. This division employs 1,150 staff and provides computer services to all the other divisions.

The French Government and the railways board have agreed a plan that aims to make the rail service profitable by 1990. This plan requires a long-term reduction in operating costs that can be achieved only through productivity improvements. The board recognised that information technology would have a part to play in improving productivity, and therefore decided to include a data processing element in its corporate plan. However, SNCF had never previously developed a long-term systems strategy. The newly appointed data processing director decided to carry out a strategic systems planning study, and selected the Racines methodology.

Racines (Recueil actualisé des choix informatiques) is designed to identify the basic options for developing information systems, to plan the management of system development over the medium term, to cope with changes in technology and business requirements, and to control and measure progress in implementing the plans. This methodology was chosen because it is logical and easy to understand, and is appropriate to an organisation of the size and complexity of SNCF. In addition it has been used successfully by other organisations, especially government departments.

Four groups of people were involved in the SNCF strategy study:

- The comité de synthèse comprising 13 divisional directors and the railways board member with responsibility for data processing.
- The steering committee made up from the heads of departments.
- Five user groups with 12 members in each group.
- The system architects, comprising outside consultants and members of the data processing division's strategic planning unit.

Stage 1 of the study was carried out in September 1984. The main activities were to set up the steering committee and the user groups, and to run an awareness meeting for the comité de synthèse.

Stage 2, carried out between October and December 1984, consisted of a review and analysis of the organisation's systems needs. The activities included:

- Interviews with the divisional directors. The aim was to identify technical opportunities and to recognise and learn from the mistakes of previous system development exercises.
- Ten meetings of each user group, plus a series of informal interviews, aimed at analysing the present situation and identifying business trends.
- Six meetings of the steering committee, leading to approval of the statement of requirements.
- A presentation to the comité de synthèse, at which the systems requirements were reviewed against the organisation's overall objectives.

Rigid application of the methodology would have required very detailed fact-gathering and analysis. Instead, the system architects prepared and presented a summary of the essential features of each area of activity to the appropriate user group, indicating the extent of computer use. These presentations provided the basis for discussing the requirements and opportunities. This modification to the methodology was felt to have been very successful because it preserved a high level of user involvement but avoided too much detailed work.

Stage 3, carried out between January and May 1985, was concerned with devising scenarios for the future provision of computer services. The purpose was to identify all the likely major impacts on existing systems, personnel and the working structure.

The intention was to estimate the costs and benefits of each scenario, but the user groups were not able to make reliable estimates. As a consequence, the railways board refused to endorse the proposed scenarios, and so any further progress was blocked. By September 1985 (two months after the study was scheduled to have been completed) only some of the required estimates had been made.

The delay has not invalidated the use of the methodology. On the contrary, it has highlighted one of the strengths of Racines. The high degree of involvement by users and top management has meant they can understand and control what is going on. Thus, in spite of the delay, Racines is well liked in SNCF and its use is regarded as a success. More than 300 people were involved in the study and they feel that the systematic involvement of users at an early stage will help to avoid user resistance when the time comes for implementing the plans.

KLM

Like all international airlines, KLM is a major user of computers. It is one of the leading European airlines in this respect, selling computer-based airline systems to several other airlines. During the early 1980s there was a growing feeling that the systems department should strive to keep more closely in touch with the changing needs of its users. The management of the department felt that one way to do this would be to write a longer-term plan for the development and enhancement of systems, based on direct input from the users.

During 1983 new directors were appointed to the systems department and to the engineering and maintenance division. The latter is the largest division in the organisation, with about 4,500 staff based mainly at Schiphol Airport, Amsterdam. The new directors inherited a pressing problem: how best to provide computing and office automation services for the engineering and maintenance division. The main symptom of this problem was a long-running debate on whether to install local Wang or central IBM equipment.

The new systems director decided that the best place to start the longer-term planning process was in the engineering and maintenance division, and he gained the division director's approval to use the Alloway methodology as the basis for preparing the plan. He believed that this should not only resolve the centralisation versus decentralisation argument, but would also provide him with invaluable insights on how the systems department was perceived by one of its largest users.

The study lasted for three and a half months. It started with a series of interviews with about ten of the key executives in both divisions. The purpose of the interviews was to agree the issues that needed to be surveyed and to identify the respondents to the questionnaire survey. About 140 people completed the questionnaire, some 110 in the engineering and maintenance division and the remainder in the systems department.

The major findings of the survey did not come as a complete surprise, but they did emphasise several aspects that had received insufficient attention in the past. These included:

- Aircraft maintenance planning and scheduling was not adequately supported by systems.
- Ninety-three per cent of the current applications were judged to be appropriate to their users' needs, but many applications failed to fulfil all the needs.
- There was a hidden backlog of demand for new services equivalent to five times the known backlog.
- In general, users needed a more rapid response from the systems department to changes in business requirements and, in particular, they needed support with their productivity improvement programme.
- Users wanted more training in systems and office automation.
- Systems analysts needed a greater understanding of the work of the engineering and maintenance division.

The strategy that resulted from the study was designed to satisfy the longer-term requirements, but it also included some short-term actions designed both to build on the impact that the survey had achieved and to bridge the time required to provide the additional resources. The central engineering and

aircraft maintenance planning departments were identified as priority areas. The computer section in the engineering and maintenance division was retained and increased computing capacity was planned for both central and divisional processing.

One of the greatest benefits of the study was that it gave the two new directors (and their staff) prejudice-free insights about current systems, new requirements, and the quality of service. As a consequence, the engineering and maintenance director was provided with a good reason (and excuse) for changing his attitude to personal computers. And the systems director was shown where the weaknesses were in his otherwise excellent department.

The computer analyses of the questionnaires included extensive tables and graphs that represented the various points of view of the respondents. Systems management, assisted by external consultants, spent a further three months digesting the detail of these analyses and preparing action plans within the strategic framework. The fact that these plans were based on users' stated needs greatly assisted in their successful implementation.

PFIZER PHARMACEUTICAL GROUP

This case history shows how a successful systems strategy was constructed at an intensive planning meeting held by the systems department, followed by skillful presentation of the strategy to users, top management and systems staff.

The general policy for the use of information systems within Pfizer's Pharmaceutical Group is that the systems division should provide any service that the users may request, provided that it makes reasonable commercial and technical sense. The Group's senior management is sympathetic and supportive, but is not keen to be over-involved with systems. It makes no particular attempt to steer systems resources into particular parts of the business, and the priorities are set by users' ability to pay for the requested services.

In January 1984 the vice-president of the systems and communications division felt reasonably satisfied with the service he was providing. He believed that the Pharmaceutical Group was an industry leader in the application of information systems and that the systems policy was working reasonably well. However, he felt uneasy about his own division. All kinds of problems required attention, and they all seemed to be complex and very interdependent. They included how best to continue to support the user community, what equipment and software to use, whether and where to use database technology, and what to do about new system building tools. He required some kind of overall planning framework within which to set these problems in their proper context.

At the end of that January he organised an off-site planning meeting, which lasted two and a half days. In addition to himself, the participants were his newly appointed systems director, the associate director and an outside consultant. They set themselves the task of answering four questions:

—What is our vision of the future role of systems in the Group?

—Why do we need a plan?

—Who is our planning audience?

—What are the real issues?

By the end of the first day they had agreed that:

—Their vision was of a 'Copernican revolution' in the provision of systems services with the systems universe centred on the users instead of on the mainframe computer.

—They needed a systems strategy because it would provide a guiding framework for tactical management, a vehicle for collecting and disseminating ideas and opinions, protection against rapid changes in the technology, and a focal point for management activity within the division.

—Their audience was themselves, Group top management, the corporate systems division, users, and their own systems staff.

By the end of the meeting they had identified more than 70 issues of interest or concern, and had grouped them into common themes. They had decided that their strategy should be to migrate away from a big mainframe supporting dumb terminals. Instead, they should install intermediate-size computers in all of the main locations, under the ultimate control of the systems and communications division but with day-to-day management by the local user staff. They also decided to develop databases as a matter of course, wherever they were appropriate.

To secure support for the strategy, they first identified the two or three key users in the eight main divisions of the Group. They set up meetings with these individuals and personally explained the strategy to them, stressing how it would affect and benefit each of them, and asking for (and receiving) their approval and support.

Next they approached the corporate systems division, who had the power to hinder or even prevent the implementation of the strategy, and gained their support. They went on to present the strategy to their own managers in the systems and communications

division, and it was here that some scepticism and resistance was encountered. They had to explain the implications of the strategy in greater detail and reassure their own staff about the implications of decreased control and the introduction of new technology.

Having secured the support of all those in the company who could either facilitate or hinder implementation of the strategy, they finally presented it to Group top management in three separate sessions. The first session formed a part of the annual budget procedure, when immediate expenditures were approved. The second focused on the overall strategic direction. The third was to top management as potential users of the new services. The strategy was approved, with top management support and commitment.

The new strategy is now being used as the framework within which the systems division's tactical plans are formulated. The value of the strategy, and the strength of users' commitment to it, has already been tested, for example in resolving debates about the type of equipment that should be used in overseas divisions.

The vice-president of systems and communications told us that he had deliberately not involved top management in the development of the strategy. He believes that it is better to use the best people to develop the right plan quickly, and then to sell it skilfully, than to delay proceedings with unnecessary consultation. Commenting on his success in getting the strategy approved, he said that:

— He had a close working relationship with the Group's chief executive (he had worked as a research chemist with him when he first joined the company).

— His division had high credibility in the company, built up by providing effective services over many years.

— He had carefully timed the presentation of his strategy to coincide with the annual budgeting exercise, when managers were keen to know how much systems would cost or benefit them during the coming year.

— The general trend in the pharmaceuticals industry, of growing interest in and demand for systems services, created a favourable climate for a new systems strategy.

In conclusion, he said that the most obvious beneficiary of the new strategy was his own division. His managers now have a much clearer vision of where they are going, and of how to get there. And he now feels that he can communicate with users and his own staff with much more confidence.

EASTMAN KODAK COMPANY

This case history shows how strategic business planning skills have been transferred successfully to strategic systems planning.

The department responsible for the strategic direction for information technology within Kodak is the Information Systems Architecture Development (ISAD) group. ISAD was formed in May 1984 on the initiative of senior managers in the photographic division. They had perceived the need to harness information systems for the benefit of the business and to achieve much better coordination between business planning and systems planning.

Although ISAD is a small group (eight people) it has corporate-wide responsibilities. It is part of a large information systems department that is responsible for systems development and operation throughout the world. The head of ISAD reports to the director of information systems. Since January 1, 1985, when there was a major reorganisation within Kodak, the director of information systems has reported, via the head of manufacturing support operations, to the chief executive of the photographic and information management division.

ISAD's staff have a wide variety of backgrounds, but they all have considerable service with Kodak, significant experience of systems work, and management experience outside the information systems department. Most of them worked outside the systems department immediately prior to joining ISAD.

The first task of ISAD was to agree on a common vision of its main task — to change the focus of systems activity, with less emphasis being placed on traditional, mainframe-based data processing and more emphasis on user-based services. The group proposed a set of specific objectives that were very ambitious in their scope and potential impact. These included:

— Linking systems plans with business plans and priorities.

— Managing systems as an investment, and as a competitive tool.

— Establishing a management council as a vehicle for co-ordinating systems investment planning, standards and compatibility, and shared common efforts.

— Influencing the company's strategic management process.

ISAD has six main areas of responsibility: operations support systems; end-user systems; information

resource management; hardware and systems software; telecommunications; and industry standards.

The group identified its audiences as Kodak's top management, user management in operating companies throughout the world, systems management throughout the world, and systems staff. Furthermore, it recognised that each of these audiences would require different outputs from the strategic planning process and would have different perceptions of ISAD's work.

ISAD's approach to strategic systems planning is heavily influenced by the group members' experiences of strategic planning in other parts of the business. The approach places heavy emphasis on creating organisation structures to carry out particular aspects of the planning task. Ten strategy centres have been established, and these act as a focus for strategic planning activity. The centres are working groups formed from user and system representatives, and chaired by an ISAD staff member. Each working group focuses on specific aspects of information technology, such as telecommunications, end-user computing, business systems, information resource management, customer/field/product information systems, needs assessment, strategic systems, artificial intelligence and industry standards. However, the strategy centres find they spend much of their time helping user managers to integrate their strategic business objectives with information technology.

The purpose of the strategy centres is to develop a long-term framework and direction for activity in their area. They make proposals for priority applications, preferred vendors for hardware and software, and the allocation of responsibilities between users and systems staff. They also propose action points required to implement the strategy. Typically, these action points are suggestions for action within the strategic framework at the tactical or operational levels. An example would be a suggestion that the systems department in a particular country should develop systems for a particular group of users.

In developing these strategies the members of the strategy centres have not used any formal methods, apart from placing an emphasis on critical success factors in some cases. ISAD has preferred to rely on a good working relationship between the individuals making up a strategy centre, because this leads to a knowledgeable and creative discussion of the issues.

The strategies formulated are not mandatory or prescriptive. They are guidelines and suggestions. However, an important aspect of ISAD's work is to 'sell' the strategies to user management, on the basis that they are in management's long-term interests. ISAD recognises that, as a staff function, its success depends heavily on building a good working relationship with both user management and systems staff, and on generating credibility through success.

IMPERIAL CHEMICAL INDUSTRIES

Following indifferent results from ICI's formal strategic systems planning methods in the 1970s, this case history shows how a much more focused method is producing results in the 1980s.

ICI is a very 'line-oriented' company. Staff functions and services are regarded as necessary evils, to be kept in their place and called upon only when required. However, like many science-based companies, the management services departments in ICI's divisions contain many skilled and highly qualified staff. These people recognised that they would not be able to deliver an adequate service unless they sought out users' requirements and planned their services over the longer term. As a result, during the 1970s, ICI was one of the first companies to use formal methods, such as IBM's BSP and Nolan Norton's Stages of Growth.

Looking back, ICI now regard those methods as slow and clumsy. They took months to carry out and years to implement. More often than not the results were out-of-date by the time they were available. Interestingly, systems managers believe that the use of these methods alienated the company's top management by creating expectations that were not satisfied within a reasonable time. Not surprisingly, strategic systems planning in ICI went out of fashion in the late 1970s.

The company's renewed economic health in the early 1980s created a fresh interest in systems planning. But this time the emphasis was on finding an approach that would involve top management personally, would direct attention to the important issues rather than the long-term, and would produce plans that could be completed rapidly before changes in business requirements made the results irrelevant. As a result, Rockart's critical success factors (CSF) method was selected for further evaluation.

Since the autumn of 1984 ICI has carried out four major CSF-based systems strategy studies (with three more in the pipeline), and has developed four model CSF exercises for training and selling purposes. Each study focuses on a strategic business unit within an operating division, and comprises one week of intensive work, followed by a period of technical planning. The study team consists of about eight people, who include the chief executive, his top management team, generally two outside consultants and a representative from the corporate management services department.

At the start of the week each user manager is interviewed for about two hours to identify his personal view of the business's critical success factors. The management services representative and the consultants then analyse the results to extract the obvious messages and to establish an initial set of success factors that are critical for the business unit. At the end of the week the whole team assembles to review the results of the interviews, to discuss and refine the initial set of factors, and to identify ways in which information systems might prove useful. By the end of the week they will have discussed and agreed their unit's mission, its business objectives, its critical success factors, and the requirements for new or improved systems.

The timetable for implementing the systems requirements is then worked out by detailed planning that not only identifies the portfolio of potential applications, but also allocates implementation priorities, taking account of cost, risk, business leverage and gestation period.

ICI believes that the strengths of the CSF method are that it is rapid, it brings together management services staff and users in a non-threatening, non-technical context, and it focuses attention on how systems can support the issues that are most important. Its greatest strength is that it has proved tremendously useful in helping to clarify purely business issues.

There are two prerequisites for using the CSF method. First, the management team members must be willing and able to be open-minded and creative. They must be prepared to take the risk that some of their own basic principles and assumptions may differ from those of their colleagues, and may be challenged and debated in public. Second, skills from external consultants are required. They are involved in the interviews, in analysing the CSFs and, most importantly, in acting as a catalyst for the working group at the end of the initial week. The consultants must encourage debate, challenge ideas, act as a devil's advocate, and feed in experiences and information from other industries.

The management services representative involved in the CSF studies admits that the results are only as good as the ideas of the people who take part. However, he believes that the benefits accruing from the process of carrying out a CSF study far outweigh any shortcomings in the results of the study.

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THE BUTLER COX FOUNDATION

Butler Cox

Butler Cox is an independent management consultancy and research organisation, specialising in the application of information technology within commerce, government and industry. The company offers a wide range of services both to suppliers and users of this technology. The Butler Cox Foundation is a service operated by Butler Cox on behalf of subscribing members.

Objectives of The Foundation

The Butler Cox Foundation sets out to study on behalf of subscribing members the opportunities and possible threats arising from developments in the field of information systems.

The Foundation not only provides access to an extensive and coherent programme of continuous research, it also provides an opportunity for widespread exchange of experience and views between its members.

Membership of The Foundation

The majority of organisations participating in the Butler Cox Foundation are large organisations seeking to exploit to the full the most recent developments in information systems technology. An important minority of the membership is formed by suppliers of the technology. The membership is international with participants from Belgium, Denmark, France, Italy, the Netherlands, South Africa, Sweden, Switzerland, the United Kingdom and elsewhere.

The Foundation research programme

The research programme is planned jointly by Butler Cox and by the member organisations. Half of the research topics are selected by Butler Cox and half by preferences expressed by the membership. Each year a short list of topics is circulated for consideration by the members. Member organisations rank the topics according to their own requirements and as a result of this process, members' preferences are determined.

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The Foundation publishes six reports each year. The reports are intended to be read primarily by senior and middle managers who are concerned with the planning of information systems. They are, however, written in a style that makes them suitable to be read both by line managers and functional managers. The reports concentrate on defining key management issues and on offering advice and guidance on how and when to address those issues.

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