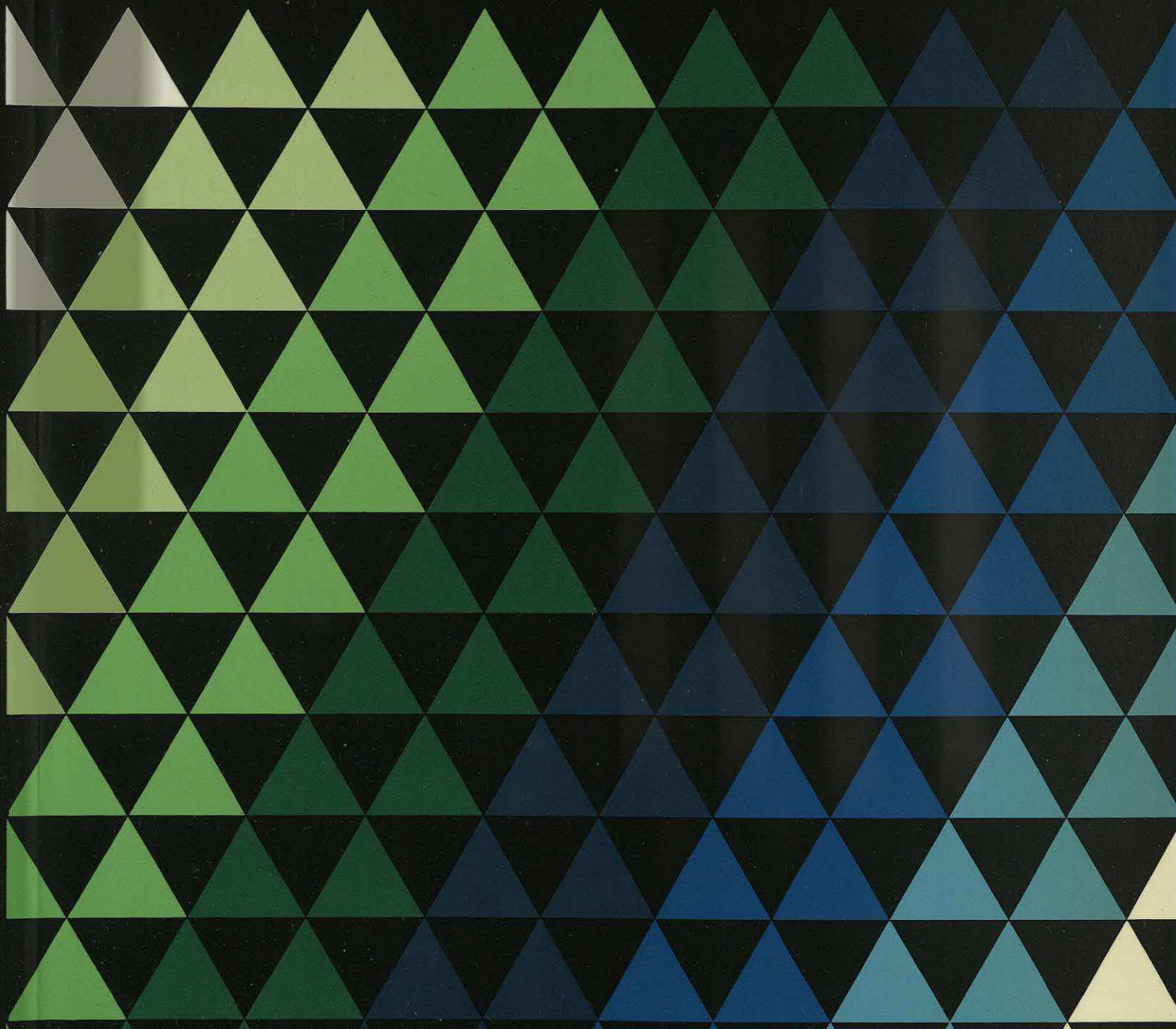
Organising the Systems Department

BUTLER COX FOUNDATION

Research Report 52, July 1986



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Summary of research findings

Research for an earlier Foundation report (No. 48 – Measuring the Performance of the Information Systems Function) revealed that, of the organisations surveyed, 53 per cent had undergone a major reorganisation in the information systems area during the preceding two years, and 43 per cent were expecting a major change within the next two years. Moreover, 18 per cent appeared in both categories, having experienced one major upheaval and living in expectation of another. On the basis of this sample, it seems that nearly a fifth of all systems departments are in a state of constant revolution.

The most important finding of our research for this report is that the root cause of the organisational problems many systems managers know they have is an overemphasis on technical factors. The organisational structure of most systems departments has been largely determined by the needs of the technology. We believe that this is now wrong, and that this inappropriate emphasis explains why so many departments have to abandon one organisational model and start again.

In the past, it may well have been appropriate to organise the systems department around the needs of the technology, creating an organisational structure that was concerned mainly with making the technology work. Such an organisation is no longer sufficient. What is required today is an organisation that is more concerned with using the technology for the benefit of the business. In other words, the organisational focus needs to change from how the technology works to how it will be used.

We believe therefore that the major organisational issues facing systems managers today involve the ways in which the systems department integrates itself with the organisation as a whole — in other words, the way in which the systems department relates to the business it serves.

In this report, we identify the main business-driven (not technology-driven) factors that a systems director needs to consider when formulating his organisational policy. Many of these factors are concerned with understanding the culture and structure of the organisation that the systems department serves and then setting out to build a systems organisation that is part of the overall corporate culture. We believe the biggest organisational challenge facing systems directors today is to create a structure that will finally break down the barriers that still exist between the business and the systems department.

The report begins with six case histories that illustrate the ways that a variety of organisations have tackled these problems. We then report on the results of a survey we carried out among the systems managers and directors who attended our discussion sessions. The aim of this survey was to identify the factors that systems managers felt were most important in designing a new organisational structure for the systems department. In many respects, the results of this survey make very depressing reading, because they reinforce the view expressed earlier that not enough emphasis is being given to business factors.

The next two chapters consider the two essential prerequisites for building a business-oriented organisation for the systems department: the need to understand and identify with the corporate culture (including the way that the enterprise will initiate, and then absorb, specialist functions such as information systems); and the need to adopt a customer-oriented approach, which requires an understanding of the different systems needs of different levels in the management hierarchy.

The report concludes with our views about the way in which the systems department of the future will evolve. The systems department will be organised to cope with many different types of systems and with different management styles and business cultures. In particular, it will not be possible to manage all types of systems activity in the same way. The final chapter also reviews the case for decentralising systems activities and gives guidance on how to strike a balance between centralised and decentralised activities. Finally it discusses future personnel issues and the role of the systems

director that this evolution implies. It concludes that the systems director of the future is:

- Seen as a corporate officer, a manager among managers.
- Technically competent, but not first and foremost a technician.
- A candidate for a top management job.
- Essentially a communicator, with a message for the enterprise.
- An ardent participant in the battle to accomplish goals.
- Keenly aware of his or her own critical success factors.
- Working full-time on securing improvements in each of the above areas.

RESEARCH METHOD

The research for this report was carried out in late 1985 and early 1986 by Hugo De Haes, a principal consultant in Butler Cox's Amsterdam office; David Butler, chairman of Butler Cox; and David Seabrook, research director of the Butler Cox Foundation.

The literature on the subject of this report is vast. As part of our research, we reviewed a substantial part of this body of knowledge and have drawn upon it as appropriate. Publications and papers explicitly referred to in the report are listed at the end of this document, and other published material that significantly influenced our thinking is included in the bibliography.

Our survey of the published literature involved us in reviewing the work of many distinguished scholars and specialists in organisation as well as in systems. To counterbalance this academic view of the subject, we conducted a research project amongst Foundation member organisations. The project consisted of a series of discussion sessions. In all, we met with the systems managers from 37 organisations in six countries (Belgium, France, Italy, Sweden, the Netherlands, and the United Kingdom). The aim of of these meetings was to obtain a practical, down-to-earth view of the organisational problems and issues facing systems managers today.

Chapter 1
Case histories

We begin by describing the ways in which a variety of organisations have tackled the problem of organising the systems department to make it a better 'fit' with the organisation it serves. These experiences are presented as six case histories, each illustrating how the particular systems department has been reorganised in response to business pressures, altering its relationship with the rest of the organisation. They also illustrate that little would have been achieved by a mere internal reorganisation of the systems department.

The case histories also illustrate the diversity of the demands on the systems department in different industries.

In an insurance company with a large customer base and relatively high sales costs, the systems department had to act initially as a cost-control agency. Once the systems team had secured that essential commodity — credibility — it could go on to offer more effective ways of supporting sales and monitoring performance.

In a bank, the systems function had to extract itself from a role where it was perceived as being both powerful and isolated from the business. This perception was changed by opening up discussion of priorities and transferring a considerable measure of control to the customers.

In a consumer goods company, the systems department was also regarded as bureaucratic, over-technical, and restrictive. After an act of unilateral independence by one business unit, a massive plan for decentralisation was adopted.

In a European airline, a technically structured systems organisation obstructed planning and the setting of priorities. After a study, a much more task-oriented and customer-oriented structure was adopted. The new structure is market-driven at the front end and performance-driven at the back end.

The systems division of a motorcar manufacturer found that its customer units wished to be more intimately involved in systems planning. An orderly transfer of some systems staff was arranged. Although there were transitional problems and delays, the new structure now works well and promises further benefits in the future.

In all cases, great benefit derived from the systems department viewing itself as a flexibly deployed unit within the corporate structure.

AN ITALIAN MANUFACTURING AND SALES ORGANISATION

This company (which has requested anonymity) manufactures and sells consumer goods in Italy. It employs 7,000 people and is structured into five product divisions and a holding company.

Until 1984, the whole data processing activity was controlled by the holding company, with an information manager in each division acting as liaison with the central data processing function. The development activities were structured by divisional application areas, and 40 per cent of all programming was carried out by external staff. Overall coordination was in the hands of a steering committee responsible for long-term planning and budget approval.

The customers in the various divisions regarded this management arrangement as too bureaucratic. It emphasised technical aspects and inhibited the use of systems by insisting on common applications for all the divisions.

After one of the larger divisions developed a warehousing application on its own and chose a different hardware supplier, the steering committee decided to promote a new allocation of tasks:

- Systems analysis and design should be handled at divisional level to achieve a close fit with the operational requirements.
- Programming and hardware operations should stay under the control of the centre.
- The central data processing function should become an information centre for common applications such as administration, personnel, and finance.

By the end of 1985, all the divisions had created their own data processing departments. The biggest difficulties that arose during the reorientation of the data processing resources were:

- Balancing the different needs of each division with the needs of the holding company, in order to maintain an overall policy and preserve the possibility of consolidation.
- Controlling the total growth in expenditure on hardware, software, and human resources during the decentralisation process.
- Maintaining a management style that allows coordination of effort without hampering local initiatives.
- Adjusting the responsibilities of the steering committee.

The most noticeable benefit of the new organisational structure has been an increase in personal commitment by local systems managers, leading to a more businesslike and entrepreneurial attitude.

A EUROPEAN AIRLINE

Early in 1984, this European airline recognised that the organisational structure of its systems department, which was four years old, had some serious drawbacks. In those days, the systems function comprised five groups:

- Computer operations.
- Communications (including research and implementation).
- Information systems development.
- Management services (customer support, office automation, operational research, etc.).
- Systems services (sales to third parties).

One of the main drawbacks was that technical support staff (systems engineers in the airline's terminology) were employed in three of the groups. Furthermore, in the absence of a formal systems strategy, personnel preferences played an important part in decisions on priority.

The airline decided to evaluate the placement of the systems engineers by involving all the people concerned and to establish with them the preferred organisational structure. This participative exercise resulted in a high degree of support for the creation of a single unit called 'technical support' that would encompass all systems engineering activities. This new unit now consists of four sections:

- Systems engineering, with 130 people organised by type of system, irrespective of product or application.
- Infrastructure, with 12 people concentrating on research, on innovative projects, and on project management of infrastructure projects. Projects are implemented by seconding systems engineers from the systems engineering unit. This arrangement prevents professional isolation, whilst at the same time providing a stimulating environment for high fliers.
- Performance analysis, capacity planning, and resource management (25 people).
- Change management.

The creation of the technical support unit resulted in the transfer of most of the people involved, and the majority of the systems engineers have been placed in the job of their preference.

The fundamental changes brought about by the creation of the technical support unit produced a demand for a survey of the remainder of the systems department. This was carried out (also in a participative manner) during 1985 and resulted in changes at two levels:

- The way in which the systems function as a whole is managed.
- The way in which customer-oriented activities are managed.

The computer operations group (comprising about 90 people) remained largely unchanged as a result of this reorganisation (although operations support is now the responsibility of the technical support unit).

The head of the systems department, who reports to the airline's general manager, received the support of two new staff units:

- A strategic planning unit, charged with the responsibility for developing five-year and two-year strategies, the latter as a guideline for the technical support unit.
- An organisation support unit, whose main tasks are to monitor the systems department's effectiveness by carrying out opinion polls and to support the department by centralising its administrative tasks.

The customer-service activities have been brought together in a group consisting of four units. Two of them are sales-oriented and two are execution-oriented:

- Systems services (identical to the original group), with ten people devoted exclusively to external sales prospects.
- Account management, with 12 people dealing with internal and external clients. This new

unit's objective is to relate new demands by clients to the systems function's complete product catalogue, taking an unbiased attitude towards the customer's request.

- An information centre with 55 people, providing all central hardware and software facilities, as well as equipment, education, and support for customers.
- An applications development unit with 190 people located in four of the airline's divisions, and grouped by type of application. (Previously, applications development staff were grouped by functional business area.)

The main advantage of the new organisational structure is that it is entirely client-oriented at the customer interface, but is efficiency-oriented for the development of systems. However, restructuring has highlighted the urgent need to introduce new tools to control and coordinate the various activities of the new units.

VOLVO DATA SYSTEMS

Volvo Data Systems is the information systems unit of the Volvo holding company. Volvo operates mainly in the car manufacturing industry, but for some years now has been diversifying into other sectors.

Ten years ago, Volvo Data Systems recognised the need to involve its internal customers more in the systems development process. This need conformed to the systems unit's own belief that both the systems function and the business should be structured according to the same organisational concepts.

Volvo Data Systems then began a gradual process of decentralising systems activities to the divisions and local companies. Over a period of time, the 300 systems development staff (systems analysts and programmers) were dispersed in units of 25 to 30 people, together with their manager, to the departments. Within the departments, these units were retained as separate units, reporting to the financial manager of the company or the division concerned. This gradual transfer of development staff was planned in close cooperation with the staff concerned and received the positive support of the large majority of them.

In addition, a central data processing unit with IBM and DEC computers with a total capacity of 80 mips was retained, along with several specialist functions such as technical support, communications planning and support, capacity planning, and policy development for applications packages and for office automation.

The local systems units have the authority to select packages and office automation applications, but they have to discuss their proposals for new developments with the central unit, mainly for planning purposes.

After some years of experience with this distributed organisational structure, several lessons can be drawn:

- The lack of existing systems skills within the local business units, and the lack of business skills within the systems units, meant that it took time to integrate the systems units within the business units. Customers soon found out that decentralisation did not solve their problems more quickly, but it did involve them more and improved their understanding of the problems. The systems people adapted quickly to their new environment, mainly because they continued to do what they always had done, but now in an environment where communication with the customer was much easier.
- The closer involvement with systems meant that the local companies became much more aware of the costs involved, which resulted in a more realistic attitude when they were formulating suggestions.
- At the time of transferring the systems units to the local companies, the managerial capabilities of the systems managers were not sufficiently developed to warrant a direct reporting relationship with the top manager of the local company or division, although it is intended to achieve this in time. To this end, an extensive training programme has been started.

Volvo Data Systems also recognises that there are several aspects of systems management that need to receive more attention in order to bring it into line with a decentralised development organisation. The most important areas requiring attention are the following:

- Documentation standards and user training will need to be coordinated by the centre.
- More use should be made of subcontractors for certain recurring tasks (such as programming), and also for technological assessments and infrequently occurring tasks. Only a small number of central specialists would be retained to manage the subcontractors.
- Career paths and promotion procedures will need to be adapted to the new situation.
- The increased involvement of top management with systems matters will change the qualities needed in systems management. Volvo has not ruled out the possibility of splitting the role of

the central systems manager in two — a staff position close to top management on the one hand, and a head of the processing unit on the other.

VICTORIA VESTA

Victoria Vesta is a Dutch insurance company that employs about 1,600 people. It came into being by merging two of the constituent companies that formed its holding company, Nationale Nederlanden, which is itself the largest Dutch insurance company. Victoria Vesta markets its products exclusively by direct selling; it is the leading Dutch company in this field.

The company sells the complete range of insurance products in the middle and lower segments of the family market. A consequence of this market position is a large number of policyholders (approximately 3.5 million) with a rather low average premium. In order to service its chosen market segment adequately, Victoria Vesta uses its own field sales force (currently 700 people). One of the key factors influencing Victoria Vesta's profit performance is therefore the way in which the relatively high cost per policy is controlled.

In 1975, rising costs led to a fundamental change in the way in which the data processing department supported the business. Earlier, applications tailored to specific products had been built. Now, applications are designed both to match the sequence in which Victoria Vesta deals with the various activities of the insurance business and to help achieve a reduction in the cost of administering each policy. In order to achieve this cost reduction, it was decided that the individual client would become the focus of every product, policy, and application.

These changes led to several actions on the part of the data processing department, the most important of which were:

- A central client file was established, and all existing applications were amended to reflect the three main areas of business activity (sales, insurance, and premium collection).
- A single database was created.
- A pilot scheme for the sales force was introduced in which 12 insurance advisors were provided with a personal computer at home. Overnight, the personal computer was linked automatically with the central mainframe so that details of the previous day's transactions could be transferred to the mainframe. The main aim of the pilot scheme was to determine whether the reduction in administration time resulted in an increase in sales effectiveness.

Changes were noticed in the way the insurance advisors planned their activities by making use of the routine facilities incorporated in the system. Also, because the system offers accurate up-to-date information about the activities and sales results of the insurance advisors, sales management was provided with new opportunities for increasing the effectiveness of the sales force. The results of the pilot were very positive, and plans are now in hand to extend the approach to the rest of the sales force.

The following changes in the structure and manning of the data processing department resulted from the business decision to extend the pilot approach:

- Systems analysis, design, and programming resources were regrouped into teams by major activity, instead of by product group.
- The contribution made by the sales force during the development of new applications was increased, but within a framework of more closely controlled project organisation and procedures.
- Two new functions were introduced — database administrator and, later, data administrator.
- An office automation unit was established to monitor technical developments and implement pilot projects.

The data processing department now has seven units:

- Systems analysis, systems design, and programming (55 people).
- Operations, including planning and administration (55 people).
- Operating system support and telecommunications (8 people).
- Database administration (8 people).
- Data administration (4 people).
- Office automation (4 people).
- Organisation and procedures (30 people).

The head of the data processing department is a member of Victoria Vesta's management board.

The changes in the data processing support for the sales force brought about by the planned full-scale introduction of local workstations have promoted consideration of several other desirable organisational changes:

- Now that most of the old transaction applications have been amended, development resources could be used to develop a whole range of decision-support systems, not only for internal management and clerical units but also for marketing and sales support. Such a move could lead to the reorganisation of the internal administrative resources from units oriented to product groups to units based on sales areas.
- The present functional specialisation of the internal administrative resources could be transformed into enlarged, integrated jobs, combining all clerical activities for a given type of policy or client, and supported by the new database applications and decision-support systems.

Finally, Victoria Vesta is considering seconding nonsystems staff to the data processing department for a limited time, and then returning them to their original department. A similar scheme for data processing staff moving in the opposite direction is unlikely because it is less attractive to the individuals concerned.

GENERALE DE BANQUE

The Générale de Banque is the largest Belgian bank, employing approximately 16,000 people in 12 administrative centres and 1,150 branch offices. Its total annual information systems budget amounts to $80 million.

The current organisation and role of the systems function reflect the historical background of the bank, which was formed by mergers of smaller banks. At present, the central systems function is organised into the following units:

- Operating systems unit, including database and data communication (40 people).
- Organisation and procedures, including standards and business computing support (20 people).
- Security, architecture, and data management (10 people).
- Systems development (160 people plus 50 temporary programmers).

In addition, there are six regional data processing centres employing 300 people, and they are coordinated by a central unit employing 60 people.

The central systems manager reports to a member of the board, who also supervises the personnel and organisation department.

Historically, the driving force behind successive reorganisations within the bank has been the systems function. Over the years, the influence of information systems on the bank's operations became progressively more important. More and more emphasis was placed on adopting and exploiting the latest technological developments in order to keep abreast of the competition. One result of this technology-oriented approach was that the systems function became isolated from the rest of the business, and systems staff were viewed from within the bank as isolated technocrats. The systems function's customers within the bank had very little knowledge of systems plans or possibilities. At the same time, operating costs in general were rising, and a 20-year period of tremendous growth in banking was coming to an abrupt end.

Because of these changes, the board initiated two major studies:

- The development of a long-term business strategy.
- A survey of the bank's systems needs. Some 300 representatives from all units and management levels participated in this survey, which was based on the Alloway methodology.

From the findings of these studies, several priorities were established for the systems function:

- To improve the cooperation between the bank's departments and the systems function. This was achieved by appointing regional systems representatives to play a liaison role. These people were recruited from the bank's mainstream business departments.
- To improve the information flow between departments. To do this, a project was set up to modify the data capture procedures in order to make data available earlier.
- To establish a formal systems strategy (linked with the business strategy) and to install the appropriate systems architecture.
- To provide improved support for the implementation of the business strategy. This was achieved by establishing a greater degree of cohesion between the regional data processing centres and by streamlining the operating procedures.
- To promote and implement an extensive information systems training programme throughout the bank.

The priorities for the systems function, and the consequent restructuring, should be seen as a phase in the development process of the bank. For the medium term, plans are in hand to increase further the online links with the administration

centres and to review the roles that the data processing centres can (and should) play in the further integration of the bank's operations, in line with the business strategy.

A LARGE FRENCH CONGLOMERATE

Since 1980, this French conglomerate company's information systems policy has maintained a careful balance between:

- The corporate management and control of the information systems function.
- The development and maintenance of applications.
- The operation of computer hardware.

The organisational structure of the systems function that has been established to achieve this balance was influenced by four basic factors:

- The company has several divisions, each dealing with different markets and product lines. Each division develops its own long-term plans and identifies its own requirements for information systems support. This gives rise to a need for coordination based on previously agreed rules and guidelines, especially in the case of applications supporting business functions that serve all the divisions.
- The complexity and pace of change of information technology led to the need to concentrate experience and evaluation skills in a single unit.
- To improve the understanding of business problems by systems staff working with the customers, it is necessary to bring the staff together at one location. Only then can the support provided by information systems be most effective, and only then can customers significantly increase their awareness of systems possibilities and limitations.
- The advisory role of the systems function towards group and divisional management had increased in importance over the years. Hence, it had become necessary to reposition the systems function within the organisation as a whole.

After several years of gradual changes in organisational structure along the lines described above, the current organisational structure of the systems function consists of three elements. The first element is an operational unit of 180 people responsible for data processing, the implementation of telecommunications infrastructure, technical assistance, and the information centre. The second element is a functional unit of 15 people that has four main tasks:

- To advise the divisions on the development of their long-term systems plans, based on a standard format.
- To study, evaluate, and recommend changes relating to the technology.
- To control investments throughout the divisions and for every type of equipment, including microcomputers.
- To advise group and divisional management.

The third element of the organisational structure is the systems department in each division. The size of these departments varies between 5 and 100 people, according to the needs of the division. Their main tasks are to design, develop, and maintain applications, and they report to the assistant general managers of the divisions. Each department also has a contact person for office automation and the information centre.

The main benefits that have resulted from this organisational structure are:

- A faster reaction to the customers' demands, helped by an improved understanding of the specific business requirements of the division.
- An acceleration in the introduction of microcomputers and business computing in general.
- A new challenge for the divisional systems managers created by their relationship with divisional management, which requires them to suggest and defend proposals.

On the other hand, there are some difficulties that require careful consideration and resolution:

- The dispersal of development staff in the divisions, and the influence of the divisions on the work, make it necessary to establish stringent methods at the central unit for coordinating the technical consequences.
- New regulating mechanisms are required to compensate for the effects of decentralisation. These mechanisms include systems architecture, overall control of system development timing, and allocation of specialists to projects.

Chapter 2

Results of our survey

Each of the Foundation member representatives who attended the group discussions that were held as part of the research for this report was asked to complete a short questionnaire. The questionnaire was designed to find out what Foundation members thought were the major influences affecting the organisation of the systems department.

INFLUENCE OF BUSINESS-RELATED FACTORS

We asked the respondents to rank the current influence of 11 business-related factors on the way in which the systems department is organised and to estimate the expected future increase in the influence of each of the factors. The results are shown in Figure 2.1, which lists the 11 factors in the order of their current impact.

The most important business influence on the organisation of the systems department is company philosophy, culture, and style. This finding is consistent with many previous studies, ranging back to Hertzberg's earliest work. More surprising perhaps is the very low rating that our respondents gave both the innovative attitude of the company and its longer-term profitability. In our view, these are both factors that must objectively be of great significance, because an innovative attitude is an indispensable condition for advanced work in systems, and the profitability of the company is the key to investment.

We believe the findings shown in Figure 2.1 present a disturbing picture. Either the key determinants of the long-term success of the systems department are not recognised as such, or if they are so recognised, their importance is minimised for cultural or political reasons. The results are even more disturbing when the expected changes in the importance of the factors are examined. These suggest that the typical systems manager's vision of the future is one where cut-throat competition in the marketplace obliges the enterprise to become more innovative and opens the eyes of top management to the contribution that the systems department can make to meet this challenge.

Figure 2.1 Business factors influencing the organisation of systems departments

Factor	*Expected increase in influence*		
	Little or none	*Some*	*Great*
1 Company philosophy, culture, and style	✓		
2 Top management's growing demands on the systems department		✓	
3 Top management's cost pressures on the systems department	✓		
4 Competitive pressures on the company's markets			✓
5 Top management's recognition of the systems department's contribution			✓
6 Industry sector	✓		
7 Innovative attitude of the company			✓
8 Changes in the objectives of the systems department		✓	
9 Longer-term profitability of the company	✓		
10 Geographical spread of the company's operations	✓		
11 Number of product lines	✓		

The factors are listed in decreasing order of current impact.

IMPORTANCE OF TECHNICAL FACTORS

We also asked the participants in our research project to indicate the current importance of, and expected future changes in, several technical factors that influence the way the systems department is organised. The results are shown in Figure 2.2 (overleaf).

Figure 2.2 Technical factors influencing the organisation of systems departments

Factor	Expected increase in influence		
	Little or none	Some	Great
1 Number of large applications installed	✓		
2 Maintenance load	✓		
3 New opportunities resulting from technical development		✓	
4 Evaluation of distributed processing		✓	
5 Pace of change in software tools	✓		
6 Pace of change in price/ performance ratio for hardware	✓		
7 Evolution of application development methods			✓

The factors are listed in decreasing order of current impact.

Figure 2.3 Personnel factors influencing the organisation of the systems department

Factor	Expected increase in influence		
	Little or none	Some	Great
1 Quality of the systems department's middle management	✓		
2 Systems management style	✓		
3 Level of specialisation of systems staff		✓	
4 Availability of staff with relevant systems skills	✓		
5 Ability of systems staff to stay up to date	✓		
6 Annual turnover of systems staff	✓		
7 Upward mobility of systems staff	✓		
8 Personnel transfers between the systems department and its customers		✓	
9 Increasing average age of systems staff	✓		

The factors are listed in decreasing order of current impact.

It is clear that our respondents feel that their choice of organisational options is limited by the burden of supporting large existing systems. But they also have confidence that the evolution of distributed processing and (above all) the emergence of new application development methods will increase their freedom of movement in the future. (Readers who have not already done so should study carefully Foundation Report No. 47 — The Effective Use of System Building Tools — to understand how this freedom may be secured.)

PERSONNEL MANAGEMENT ISSUES

The next group of factors we analysed was concerned with personnel management issues. The results of our survey are shown in Figure 2.3.

The most important personnel issues that influence the organisation of the systems department are seen as the quality of middle managers and the management style of the department itself. This judgement seems to us to be mature and realistic. Factors that would perhaps have been rated as more influential ten years ago, when the systems department was less mature, include the supply of skilled personnel and the ability of staff to keep up to date. On the other hand, we suspect that in the demanding environment of the future, when systems staff will be working closely with the staff and management in the organisation's business units, some of the last five factors listed in Figure 2.3 will grow in importance. We believe that our respondents have underestimated the degree of change that will be necessary; in this, they are probably quite representative of the systems community in general.

RELATIONSHIP WITH CUSTOMERS

Central to the task of organising the systems department, and to maximising the contribution of systems to business success, is the effective management of the commercial relationship between the department and its customers. Our survey therefore sought the views of systems managers about the customer-related factors that influence the organisation of the systems department. The results are shown in Figure 2.4.

Our respondents regard the need for closer cooperation with their customers, together with customer involvement in development, as the two most important influences today. They also indicated that these two factors would be more important in the future. This suggests that they are fully aware of the process of maturity and externalisation that is affecting systems departments today.

Figure 2.4 Customer-related factors influencing the organisation of the systems department

Factor	Expected increase in influence		
	Little or none	Some	Great
1 Need for closer cooperation with customer departments		✓	
2 Customer involvement in application development			✓
3 Criticisms and demands by customers	✓		
4 Growth in personal computing	✓		
5 Economy drives in customer departments	✓		
6 Growth in demand for support by customers		✓	

The factors are listed in decreasing order of current impact.

Interestingly, the growth in personal computing is regarded as fairly unimportant now, and as likely to remain so. It is possible to regard this finding as indicative of a certain myopia in the systems department — a willingness to let the customers play with their spreadsheets while the real work goes on elsewhere. But evidence collected from other sources by Butler Cox suggests that this view may, in fact, be more perceptive. In projects undertaken for equipment suppliers in Europe and the United States, Butler Cox has recently detected something of a backlash against the personal computer. Some customers have simply grown tired of trying to cope with not very friendly systems, and have given up. Others have rapidly reached the end of what they could achieve alone, and have returned to the systems fold. Some — mostly those who have experimented without the support of the systems department — feel that they have been oversold by the vendors.

Whatever the reasons, we have found that millions of business users who two years ago thought that they could cope with their systems needs alone by using a personal computer are once again turning to the systems department for guidance. Furthermore, salesmen who thought they could neglect and bypass the systems team are once again wooing the systems department.

In one area, however, we feel that our respondents are dangerously complacent. Economy drives in customer departments are rated very low as a current factor and are not expected to grow much in significance. Doubtless there are reasons for this belief. One of the advantages of working in the systems arena is that when companies feel expansionist, information systems can be depicted as a means of attacking new markets or launching new products, but when they feel defensive they can be depicted as a powerful instrument for cost control. But justified as such claims may be, they are not a complete protection against the possible future impact of economy drives.

The systems department faces in the next decade the combined influence of two major trends. First, there is a great deal of technical complexity in systems to be absorbed and mastered. Open systems interconnection, integrated services digital networks, genuinely multifunctional terminals, new application development tools, new database methodologies — all of these must be dealt with. At the same time, as our respondents fully agree, the customer will be observing the system-building process from a position of far greater intimacy and involvement that ever before.

In our view, it is inevitable that the customer departments will develop and express very strongly held views about how far and how fast new technologies can or should be taken on board. And because more of the expenditure on systems will reside in customers' own budgets, they will be able to take immediate action to tighten the purse strings when they feel it to be appropriate. We believe our respondents have taken too narrow a view of the system-building process and have taken insufficient account of the overall context in which this process takes place.

HOW THE SYSTEMS DEPARTMENT PERCEIVES ITSELF

We also asked the participants in our research project to assess the position of the systems department within their enterprise, in relation to certain criteria and in comparison with other specialist functions in the organisation. We were interested in a technical comparison, a management/personnel comparison and, finally, a comparison based on the degree of 'corporate fit' — in other words, is the systems department a good team player within the corporation? Respondents were also asked to assess how much improvement was necessary in the future for each of the criteria. Figure 2.5 (overleaf) shows the results for the technical criteria.

By and large, the results shown in Figure 2.5 represent a confident self-perception. Systems managers perceive their departments as highly successful in developing and maintaining the technical skills required to fulfill their tasks. In the

Figure 2.5 Self-perception of the systems department, measured by technical criteria

Performance of systems department, compared with other departments	*Degree of improvement necessary*		
	Little or none	*Some*	*Great*
Above average			
Technical literacy of middle management	✓		
Training of systems staff	✓		
Keeping within annual budget		✓	
Keeping up to date	✓		
Average			
Use of planning techniques		✓	
Developing policies for the systems department		✓	
Below average			
(nil response)			

Figure 2.6 Self-perception of the systems department, measured by management criteria

Performance of systems department, compared with other departments	*Degree of improvement necessary*		
	Little or none	*Some*	*Great*
Above average			
(nil response)			
Average			
Use of annual performance appraisal procedures	✓		
Career counselling of systems personnel	✓		
Upward flow of information in the department		✓	
Following salary trends	✓		
Responsiveness to ideas from own personnel		✓	
Below average			
Cooperation within the department		✓	
Downward flow of information		✓	
Quality of middle managers		✓	

more difficult areas of forward planning and policy formulation, the systems department has something to learn, but it does not compare badly with other business functions.

We next wished to know how the systems department's management performance was rated, including some aspects of routine administration and others of a more sophisticated nature. The results are shown in Figure 2.6. In this assessment the systems department is more critical and less confident of its own performance. In no area does the systems department excel, compared with the company at large. This is in sharp contrast to the technical skills area, where the function was never below average. Moreover, systems staff are perceived as competent in carrying out the formal, mechanistic management tasks — tasks that can be fulfilled within a well-defined set of rules and procedures. As the horizon widens and the tasks become both 'softer' and more demanding, so confidence ebbs.

There is, however, one oddity in these responses — an apparent anomaly for which we have no ready explanation. In the crucial areas of departmental coordination, top-to-bottom communication, and sheer management capability, our respondents rated the systems department as below the average for the organisation as a whole. Yet in all three areas, they indicated that only a moderate degree of improvement was necessary. These findings suggest a degree of complacency — or even world-weariness — that is both stunning and alarming.

On the face of it, our respondents appear to be saying that, in comparison with marketing, production, finance, administration, and other functions, systems staff cannot work as an effective unit, do not receive or understand the guidance given to them by their leaders, and are poorly supervised and directed. Yet at the same time, the responses say that in these same crucial areas, it is not worthwhile making much of an effort to change.

In the hands of a hostile critic, these responses constitute a damning indictment of the systems department. Even in the hands of sympathetic researchers, they are puzzling and disturbing. We would like to believe that there is some other, less worrying, interpretation that could be placed on the data we have gathered. There is, however, worse to come.

We next asked our survey sample to consider whether the systems department compared well or badly with other parts of the organisation in terms of its 'fit' with the rest of the organisation. We believe this to be a key question, because a systems department that is incapable (for organisational or

cultural reasons) of doing business with its internal customers on their own terms is very unlikely to be successful. The results of this part of our survey are shown in Figure 2.7.

As before, it is hard to interpret these findings in any way that is not damaging to the systems department, and perhaps offensive to some of our readers. The systems department is believed to be outstanding only at being asked for advice by others and working with other departments. These are minimal claims; the systems department is, in most enterprises, the sole repository of knowledge about systems, and the customers have no choice but to ask questions. And since systems are becoming all-pervasive in organisations, the systems department is bound to be better at working with other departments than functions that operate in more watertight compartments.

In the crucial areas of establishing cultural and political links with the sources of power in the organisation, contributing to policy, and influencing decisions, the systems department is seen as performing relatively poorly. Yet what is the answer? According to our respondents, top management must extend greater recognition to the systems department, even though the department itself will make little or no effort to conform to the company culture.

We believe that these findings indicate that the typical systems department has a muddled and inconsistent view of itself, and of its role and its capacity. The systems department understands well what the key ingredients of success are. It can see, with perhaps an unusual degree of candour and self-knowledge, that in certain of these key areas it is perceived as performing no better than other functions in less critical roles. It even recognises that its performance is below the organisation norm in some areas. So what does it propose to do to remedy these defects? Almost nothing, say the results of our research.

In the remaining chapters of this report we consider specific points where the organisation and orientation of the systems department can be sharpened. But our first, and most important, finding is that in many organisations the systems department faces the challenge of the next decade with a perilous lack of confidence and resolution. We have no doubt that most systems directors and their staff need to improve greatly their perceived ability to conform to company culture. To believe otherwise is dangerous self-deception.

Figure 2.7 Self-perception of the systems department, measured by corporate 'fit'

Performance of systems department, compared with other departments	*Degree of improvement necessary*		
	Little or none	*Some*	*Great*
Above average			
Being asked for advice by others	✓		
Working together with other departments		✓	
Average			
Investment plans readily accepted		✓	
Understanding of company's objectives		✓	
Adapting to changes in company plans		✓	
Below average			
Conforming to company culture	✓		
Recognition by top management			✓
Contributing to company policy/strategy			✓
Influencing policy decisions			✓

Chapter 3

Understand the culture of the organisation

Information systems departments develop and operate systems for the benefit of their organisations. Their 'customers' are the people who work in the mainstream of the business, and to be successful the systems department has to be accepted by the business as an equal partner. Regrettably, this is not always the case. At the Foundation Conference at Gleneagles in 1985, several speakers referred to the cultural problems encountered by the systems department in dealing with the rest of the business. In particular, David Butler emphasised the need for systems directors to recognise, and involve themselves with, the 'realpolitik' of the organisation; and Anthony Bargioni, then with the Beecham Group, provided a practical case history of how this problem had been tackled in Beecham. (Transcripts of both these presentations have been published by Butler Cox.) In this chapter we analyse more closely some of the cultural and organisational factors that shape enterprises, and we discuss their implications for the organisation of the systems department.

First, though, we can dispose of a piece of mythology, and one that has been surprisingly long-lived. It used to be a commonly held belief that the reporting line of the systems department was, in many organisations, too low to reflect the true importance of the function. If this belief was once warranted, it seems no longer to be. During the research for Foundation Report No. 48, we found that 80 per cent of the systems directors in our sample reported to a main board member — chief executive officer, managing director, financial director, or other director. From this finding it seems clear that any lack of rapport between the head of the systems department and his or her masters is not the result of an inadequate structural link, nor is it the outcome of a lack of opportunity for communication. The link exists, but for a variety of reasons it is not being exploited.

ORGANISATIONAL DEVELOPMENT AND MANAGEMENT STYLES

Anthony Bargioni's presentation at Gleneagles also emphasised the need for the systems department to play closer attention to its parent organisation. The systems director must be more at home in the 'corridors of power'. How is a better understanding of the organisational realities of the enterprise to be secured? In some ways, an organisation is like a product, with a life-cycle of its own. Just as the potential of a product is best exploited by understanding its life-cycle position, so too the systems director must understand where his or her enterprise stands on the life-cycle curve, and must also understand the impact its position has on the style of management likely to be appropriate.

John Kimberley and others (see reference 1) have identified three phases in the organic growth of an enterprise: initiation, institutionalisation, and decline.

During the initiation phase the enterprise is established and takes its first steps along the path to growth. This phase is marked by a high degree of enthusiasm for risk and a high tolerance of errors, and individual freedom is encouraged. High performance and success in a limited arena is the norm, as the ambition of the enterprise gradually grows and its arena of operations is enlarged. The roles and personalities of the early leaders are crucial in getting the enterprise up and running.

During institutionalisation, the enterprise progresses, in market terms, through growth to the early stages of saturation. This phase is characterised by increased formality and by the stabilisation of relationships within the group. Individual freedom is curtailed, and some of the appetite for risk-taking is restrained. Organisational attributes that accounted for the early success are now suppressed and replaced by different norms and structures. Inevitably, some of the early leaders will find themselves at odds with the new realities and will either leave or accept less dominant roles.

The decline phase occurs when the enterprise allows its market approach, its product development, and its organisation structure to stagnate. As a rule, this process occurs through complacency; a myth of invulnerability takes root, based upon

the successes of the past. This process leads gradually to stagnation, retrenchment, and eventually extinction.

Although the three phases can be depicted as following a logically inevitable sequence, and as generating or sustaining the kinds of leaders the circumstances demand, it is equally true that the personality and management style of the leaders also influence the way the phases progress. It is partly for this reason that every enterprise finds its own route along the development path.

Edith Penrose (reference 2) has identified four basic styles of management: owner/founder, empire builder, professional manager, and businessman. Each of the four styles both influences and is influenced by the phase of development in which the enterprise finds itself, not least because leaders in each style will exhibit patterns of behaviour illustrating their very different expectations, and their sometimes surprising yardsticks of success.

In most cases the owner/founder is satisfied with a comfortable income and an undemanding life. He or she is unwilling to make sacrifices or take risks to make more money. This is the reason why so many small companies stay small.

In sharp contrast, the empire builder or entrepreneur is driven by visions of acquiring more market share and more power and achieving the discomfiture or destruction of competitors. The emphasis is usually on technological advance, product innovation, and hard selling. The empire builder can generate very rapid growth — but can also (unless he or she steps aside at the right moment) preside over equally rapid decline.

The professional manager is interested in the growth of the enterprise through improvements in quality, cost control, technology, and market access. The main defence against competition is seen as coordinated management of market penetration, product differentiation, pricing, and selling. In this respect the role of the manager is akin to that of the conductor of the orchestra, rather than the virtuoso soloist.

The businessman has many of the attributes of the professional manager, including administrative skills and (perhaps) flair. In Penrose's classification, however, the businessman lacks one essential attribute: he shows little ambition or initiative to secure greater prestige for the organisation, and perhaps has little interest in what it actually does.

In the life of an enterprise, it cannot be taken for granted that the appropriate management style will automatically be adopted to suit each developmental phase. Moreover, the juxtaposition of management style with phase of development also determines to a large extent what role a particular skill or function can play within the enterprise.

Information systems directors need to recognise, and identify with, the phase of development and the management styles currently prevalent in the different parts of the business they are serving. Only by doing this will the systems department be able to do business with its customers in terms that the customers understand and respond to. The implication for many Foundation member organisations is that the systems department will have to adopt a chameleon-like quality. Many organisations have different business units covering the whole range of organisational life cycle and management style. The systems department must be able to change its method of dealing with its customers to suit their particular management style and growth phase.

ROLE OF SPECIALISED UNITS

Another organisational factor affecting the relationship between the systems department and the business concerns the way an enterprise uses specialised functions and then absorbs them into the mainstream of the business. The systems department is just one of a set of specialisations that an enterprise uses in order to achieve its operational objectives. Paul Lawrence and Jay Lorsch (reference 3) have examined in a variety of industries just how these specialisations arise, develop, and compete for resources.

Lawrence and Lorsch point out that the need for special skills is often a result of purely external pressures. In response to its external environment — markets, competition, customers, legislation, etc. — the prudent enterprise develops specialised units. Their findings indicate, however, that the level of response can vary widely. The determinant is uncertainty. The more complex and unpredictable the external environment, the greater the need for highly specialised and highly differentiated groups. With more and more such groups, each studying a specific, narrow area in great detail, there is a chance that there will be people somewhere in the organisation, worrying about everything that matters. The proliferation of specialisations also leads to the obvious danger of departmental conflict and lack of coordination. The greater the degree of differentiation and specialisation, the greater the danger of discord.

Most enterprises have only a limited ability to change their external environment. They cannot dictate to their markets, abolish the competition,

or pass laws. Hence they cannot eliminate, or even markedly reduce, the need for differentiated internal skills; to put it bluntly, they are stuck with a marketing department and a legal staff. They must therefore concentrate on better organisation of the essential skills. The management of internal skills becomes a key determinant of corporate success. It comes as no surprise that there is a marked statistical link between those companies that successfully integrate highly differentiated skills and those that achieve good business results. Among the better-performing companies, Lawrence and Lorsch found four main mechanisms employed to coordinate skills:

- Cross-functional teams, sometimes at more than one management level; in those organisations with the most highly differentiated skills, the cross-functional teams are permanently established.
- Formal management hierarchies.
- Direct horizontal management contacts.
- Formal reporting procedures.

Just as enterprises as a whole pass through various phases to attain maturity, so too do the specialised skill units within the enterprise. They rise and fall, flourish and perish, in accord both with objective requirements and with current fashion. In the past, other specialised units have been dominant in the enterprise — organisation and methods (O&M), personnel, and accounting, to name but three. Over a period of time, the skills that hitherto existed in these separate specialised units tend to be absorbed into the mainstream business units.

The need for a high-performing company to coordinate the work of its differentiated specialist units is certainly consonant with what has been said about the progressive integration of the systems department with the business as a whole. However, the feeling, which still prevails in some organisations, that the systems department is somehow 'different', 'out there', is a serious stumbling block to real progress. As already stated, we believe this gap in perception arises from the muddled view the systems department often has of its own present and future role, and from an inadequate understanding of the cultural and structural realities of the enterprise. How then does the systems department itself progress along the path towards maturity? And what are its relationships with other skills?

EVOLUTION OF THE SYSTEMS DEPARTMENT

The well-known work of Richard Nolan (see reference 4) is still relevant. The original four-stage progression postulated by Nolan and Gibson was later refined to six stages, represented as two eras each consisting of three stages as depicted in Figure 3.1. The underlying reason for this refinement was the recognition of the need for an overall systems architecture and for data management, so that a business unit could use its computing resources in a mature way.

Figure 3.1 Stages of development

Era	*Stage*
Assimilation of computer technology	1 Initiation 2 Contagion 3 Control
Assimilation of data resource technology	4 Integration 5 Data administration 6 Maturity

(Source: Nolan — see reference 4)

In Foundation Report No. 30 (End-User Computing) we postulated the existence of a third era in which the emphasis would be on the assimilation of end-user technology, and which would also consist of three stages (initiation, contagion, and control). During this third era, the systems department will need to rethink its mission and its methods of working.

In our estimation, most readers of this report will work for organisations that are fast approaching, or have crossed over into, the third era. In the approach to this era, system design methods will need to be overhauled. New methods will be required to help customers in the business units build more flexible and responsive support systems. At the same time, a central research function may also be established to perform forward reconnaissance. Better communications will usually be established at senior levels within the business units. A central group will be set up for vetting the architectural integrity of projects.

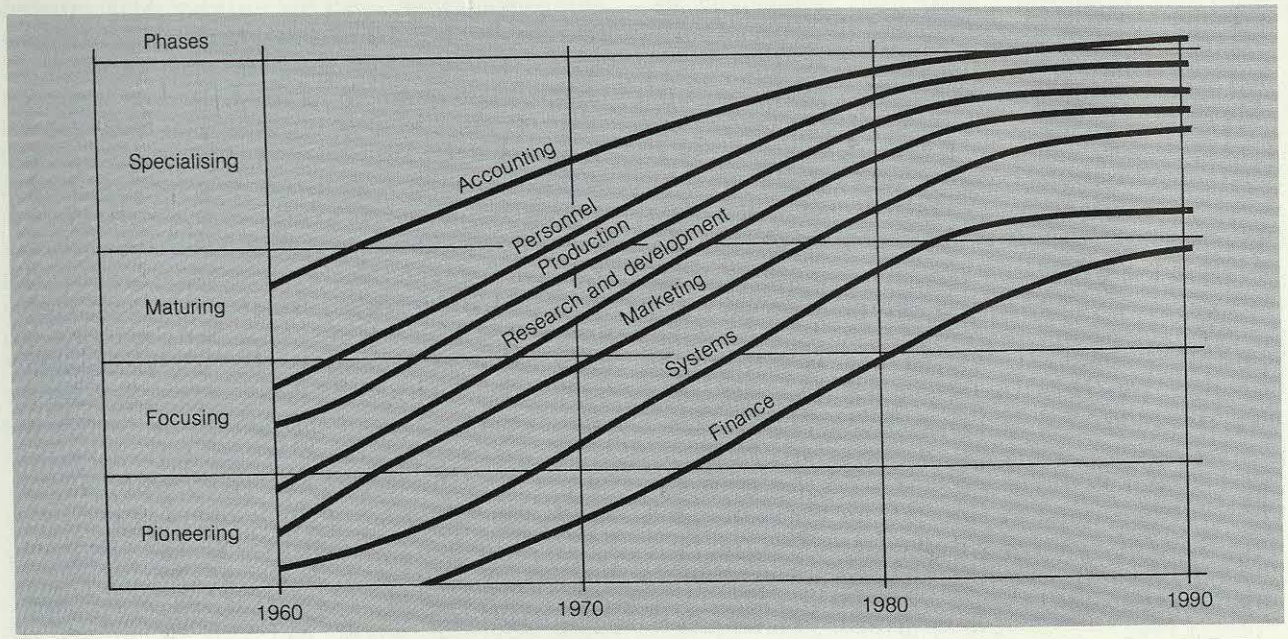
Whilst the existence of these evolutionary stages is widely known and recognised, it is not always clear that they are not exclusive to the systems department. The systems department is probably the latest specialised unit to be introduced into most commercial and industrial organisations, following other skills such as marketing, research and development, and personnel. In most organisations, new skills are imported by setting up a new unit as part of an established function. Marketing was brought in under sales; research and development under production; and personnel under general management. Usually, the systems department was first introduced as a dependency of the accounting function. While these arrangements

were logical enough at the time, it is interesting to speculate what might have happened, for good or ill, if the systems department had been launched under general management supervision. It might have matured more quickly, or not at all.

As the perceived importance of a specialised unit grows, so it strives to break free and become independent. Figure 3.2 shows schematically the development in the past three decades of seven specialised skills (including systems) over four development stages (pioneering, focusing, maturing, specialising). When a specialised unit reaches maturity, it is inevitable that certain major parts of its past portfolio of skills become dispersed through the organisation. These tasks become, so to speak, 'normalised', with a residue of highly specialised tasks remaining. While the size of the specialist unit may cease to grow or may even decline, its influence may increase. Some of the normalised tasks, no longer sufficiently complex to warrant the attention of the specialist group, may be taken over by the business units and perhaps then externalised, by subcontracting them to a third party.

Figure 3.2 shows that the systems speciality follows the same development path as other specialities. It may therefore be expected that over the next five years the systems functions in many organisations will emerge from maturity into what in Figure 3.2 is termed 'specialising'. Because systems are a key element in competitive strategy, pressure from senior management may force this transition to occur more quickly than normal evolution would permit.

Figure 3.2 Growth phases of functions within industrial organisations



Chapter 4

Adopt a customer-oriented view

Throughout this report we have avoided the term 'users' in the context of information systems. Instead, we have referred to the systems department and its customers. This terminology has been deliberately chosen to highlight the essentially commercial relationship that inevitably exists between the parties as the systems department approaches maturity. We hope that this choice of terms will make a modest contribution to changing old habits of thought. We are convinced that such a change is necessary. To exploit fully the potential of information systems, organisations must abandon the last vestiges of thinking of systems as a shared overhead service.

Many organisations have already recognised the need to do this, and have taken action to improve the support given to their customers. In particular, many organisations have now formalised this support in an information centre. Although the establishment of an information centre is a move in the right direction, by itself it is not sufficient. We believe that the whole of the systems department needs to be reorganised so that it takes a customer-oriented view of everything it does. Increasingly, it will be necessary for the systems department to market and sell its vision of the future to the business it serves, and this can be done effectively only by adopting a customer-oriented approach.

In this chapter, we provide a context for understanding the generic needs of the systems department's customers. Once again, we remind our readers that we are not seeking to provide a specific answer for every question that can arise between the systems department and its customers. Rather, we will identify the major policy questions that must be resolved if the relationship is to be effective.

We consider in turn the requirements of top management, senior management, and middle or junior management. We then identify the need for the systems department to take the lead in changing the allocation of responsibilities between the department and its customers. Such a change in responsibility is vital if the new, customer-oriented outlook is to be successful.

THE NEEDS OF TOP MANAGEMENT

A consistent thread running through the literature about the future of business in the 'postindustrial society', and one of consequent interest to enterprises that wish to survive and prosper therein, is the use of knowledge. Most authors agree that alongside the familiar problem of organising to produce efficiently, greater emphasis will also be placed on organising to make better decisions. Peter Drucker (see reference 5) says this is the most important change in what he calls the Age of Discontinuity. ''Knowledge, during the last few decades, has become the central capital, the cost centre and the crucial resource of the economy. This changes labour forces and work; teaching and learning; and the meaning of knowledge and its politics. But it also raises the problem of the responsibilities of the new men of power, the men of knowledge.''

Part of what Drucker means is easy to understand and obviously true. Anyone who has worked in a motorcar factory will immediately grasp the point. But the words about the men of knowledge are less easily understood. Does Drucker mean that eventually the world will run by university professors? Or that no one without a first-class degree can be on the board of a company? Is the value of experience, personal drive, ambition, skill with people, gradually to be eliminated? In fact, Drucker means none of these things, as his chapter on the 'New Entrepreneur' clearly shows. What changes in the decision-making environment can we then detect?

At one level the change is obvious. There is a growing readiness at board level and top-management level to use information systems as a decision-making tool. Whether such tools are termed decision-support systems or merely regarded as a special class of application programs is largely immaterial. The use of computer graphics as a way of highlighting facts and options is also on the

increase, although the use of the term 'war room' to describe such tools alienates as many potential customers as it attracts. And Butler Cox has never subscribed to the heady theory that one day intelligent knowledge-based systems would relieve management of the task of making any decisions at all. However, for certain specialised applications, knowledge-based systems are already an indispensable aid to decision-makers. What is the overall organisational impact of these changes? And what significance do the changes have for the way the systems department should do its job?

One characteristic of the survivor company in the postindustrial marketplace is that it will be structured to facilitate innovation. At the corporate headquarters of a certain multinational company, the corporate organisation chart was proudly displayed. An unknown hand wrote on the chart, 'Across this chart from root to crown, ideas flow up and vetoes down.' This is the very opposite of what is required for the survivor company. In the defence, electronics, and pharmaceutical industries we already see organisations committed to and utterly dependent upon innovation. Quite often, however, such industries adhere to two organisational theories simultaneously, one in the innovative arena and one in the routine arena. Innovation is seen as the product of loose, organic structures with overlapping domains and lots of unstructured data. Within the same enterprise, production, marketing, and distribution may well be organised in a tight, hierarchical manner, with the systematic use of structured data. Moreover, the organisational split between the innovation workers and the routine workers may well correspond with the levels in the company, with the senior levels doing the innovating.

In an era of rapid change and instability, the ability to respond quickly to new challenges and opportunities becomes crucial. How can large enterprises acquire the agility of small ones? Some enterprises favour the creation of an organisation within the organisation, an experimental core of people who track developments and consider alternative responses. The success of such units is not to be taken for granted, however; they can easily become isolated from the business and hence ineffective. In most organisations the task of tracking developments will probably not be given to a specialist unit, but will simply become a more important part of the responsibility of the marketing director, the production director, and other functional heads. It is also highly probable that the ability to scan the external environment and to sense imminent change will be a more important selection factor for top management than ever before. What does all this mean for the systems director?

The systems director of the near future will need to offer top management three classes of product. The first is the traditional product of the data processing function, the well-produced and well-managed internal control system. Because such systems are relatively well understood, they lack the drama and mystery of more innovative work. But in the Age of Discontinuity, the need to control resources and to know how the business is doing becomes more, not less, important. Thus, no systems director can afford to neglect the operational, large-scale systems that monitor company performance and the exploitation of assets.

The second class of products for top management includes systems designed to help top managers take decisions, the decision-support or board-room applications. These systems need to be built jointly with top management. They often have a strong visual element, through the use of colour graphics. They usually depend on the aggregation or analysis of data from the operational files. The key ingredient in their generation is their ability to look at a business problem from a viewpoint not previously considered possible or useful. Knowledge-based systems are a very refined, very sophisticated, and very special case of this kind of system.

The third class of product for top management arises from the growing need, mentioned above, to scan the environment. Systems directors will have to become much more expert in the use of public and private databases. They will not control the external information that top management uses, but they will need to provide the board with a comprehensive 'buyer's guide'.

THE NEEDS OF SENIOR MANAGEMENT

The level of management just below the board is a key group of customers for the systems department: we refer to them as senior management. In order to understand their needs for information systems better, we can start with the work conducted by Henry Mintzberg (reference 6) and Daniel Isenberg (reference 7), who have studied the work patterns of senior managers. Mintzberg studied the way senior managers use their time at work, and the kinds of activities that seem to interest them most. His main findings are that senior managers typically work very intensively in short bursts, moving rapidly over a range of problems or over many aspects of one problem. They appear to dislike protracted contemplation. They like doing things. Senior managers spend between 65 and 80 per cent of their time talking and listening. The majority of their conversations

are informal and unplanned. One of the benefits of all this unplanned conversation is that senior managers acquire 'soft' but valuable external information, exploiting their status and connections in ways their subordinates would find impossible. It is immediately obvious that such a pattern of activity is not the easiest for the systems department to support.

Mintzberg's work was carried out a decade ago, but we doubt that the validity of its findings has changed much with time. More recently, Professor Isenberg has been studying the way senior managers think. (Professor Isenberg addressed the 1985 Foundation Conference at Gleneagles. A summary of his presentation can be found in the session summaries published after the conference.) Consistent with Mintzberg, Isenberg finds that senior managers are multiprocessors, dealing simultaneously with many problems or opportunities. Their approach to a question rarely rests wholly upon either logic or instinct, but usually on a mix of the two. Senior managers, says Isenberg, do not like to commit themselves irrevocably to one course of action. They take, in response to any challenge, the minimum action that will keep the company moving towards the best available goal, and wait for a better opportunity for action to emerge. They create flexibility wherever possible. They constantly alternate between decision and action. Most revealingly for the systems department, Isenberg identifies that the difference between the 'good' and the 'bad' senior manager lies not in the availability or unavailability of information, but in the quality of the managers' intuition and judgement.

There is a further refinement in the way senior managers work that has an important influence on how the systems department does its job. Many people would argue that the basic task of a senior manager is to maximise profit. However, Isenberg's research shows that this is not what senior managers actually do. Senior managers progressively refine their decisions in the light of continuous feedback. Their goal is to extract as much profit as they can, within practical constraints. Senior managers are in this respect like soccer players. Their theoretical aim is to score as many goals as possible. But if they are winning and the end of the game is near, they may play defensively. It follows that information systems designed to identify the maximum potential profit are not necessarily relevant to the interests of senior management.

Professor Isenberg concludes that the products that senior managers will buy from the systems department include systems that provide better, but not necessarily more, information; systems that provide data that goes beyond the bounds of straightforward historical figures; and stable, repetitive systems for their subordinates. Most importantly, Isenberg concludes that senior managers will value very highly decision-support systems that provide for both rational and intuitive factors, that permit flexible use of data and models, and that do not fall apart technically just when something interesting is in sight.

Isenberg's research confirms the view that the function of decision-support systems has changed. These systems were sometimes perceived as a by-product of the ubiquitous personal computer, remote from and possibly threatening to the world of conventional data processing. Although it is true that decision-support systems have certain attributes that are alien to the world of data processing (such as the creation of many small models rather than one big one), it has also become very clear that the involvement of the systems department is necessary. Senior managers who use decision-support systems want to be free to range over problems at will. They need to be able to cross the boundaries between the many small models. Only a skilled systems practitioner can provide safe routes for them to do so.

THE NEEDS OF MIDDLE MANAGEMENT

The ranks of middle management have for many years been the prime target for rationalisation based on systems. Simple arithmetic shows that if the normal span of control of a manager (roughly one manager over four or five people) can be increased to six or seven, the ranks of middle managers will be reduced considerably. However, in most organisations, the ranks of middle managers have shown a surprising degree of durability over the years. Nevertheless, the prospects for a serious reduction in administrative manpower remain on the management agenda. In many organisations, as Paul Strassmann has pointed out (see reference 8), real cost reductions will be secured only when rationalisation occurs among the professional and administrative staff, the opportunities for clerical cost savings having largely been exhausted.

Gradually, techniques are emerging for the management of enterprises in a low-growth or zero-growth economy. More and more operational decisions can be taken by first-line managers, using information technology rather than human support services. The traditional purpose of such intermediate layers of management has been twofold. They manipulated data generated by lower management for use by upper management, and they translated commands from upper management into action by lower management. It is this intermediary function that now comes under the closest scrutiny.

THE SYSTEMS DEPARTMENT MUST TAKE THE LEAD

During our research for this report, we asked our respondents how the balance of responsibilities between the systems department and its customers should change over the next three years. Figure 4.1 contains our findings. Essentially, the systems department is seeking greater responsibility in the area of technical systems architecture. Where both the systems department and its customers are seeking more responsibility, we do not necessarily conclude that such a finding is contradictory. It should be interpreted as stressing the need for greater cooperative effort, with increased responsibility for both parties.

Some years ago Butler Cox conducted a consulting project for a client in the engineering industry. One clear conclusion we reached was that the systems in operation did a very poor job in meeting the needs of the customers. The board interpreted this conclusion as confirming their own suspicion that the overzealous systems department had been pressing onto its customers systems they neither wanted nor needed. The board issued a directive that in future only systems that a customer department spontaneously requested should be considered for implementation. With this proposal, by the way, the systems director was in full accord. A year later Butler Cox was asked to review the situation. Not surprisingly, there were no systems proposals in the pipeline at all. In a situation where the existing systems were clearly recognised as not meeting the needs of the business, all efforts at improvement had been systematically and comprehensively cut off at the root.

It seems that times have changed little. Our findings from the present research show that our respondents still want the customers to take more responsibility for initiating new applications, for setting priorities, and for developing systems. As we have already explained, we see increasing involvement and effort by the customers as inevitable and desirable in the future. But as we have also indicated, we believe that the systems department has a crucial leadership role in developing and clarifying the future potential of systems. We are in no doubt that the strategic future of systems in most organisations will be devised and implemented only as a result of the drive, vision, and foresight of the systems director and his team. We would hate to see this mission abandoned as a result of excessive humility on the part of the systems department.

Figure 4.1 Future changes in responsibilities of the systems department and its customers

		Customers	
		No change	*Additional responsibilities*
Systems department	*No change*	Annual systems plan Maintenance on new applications Purchase of software for personal computers	Developing specifications for new applications Setting long-term priorities for systems Developing new applications Cost-benefit projections for new applications Needs definition for new systems support
	Additional responsibilities	Hardware standards Company policy on personal computers Application software standards Data and database standards	Project management for large applications Evaluate effect of new applications on the existing organisation of tasks and departments Suggestions for new/improved use of systems

Chapter 5

The systems department of the future

In the final chapter of the report, we first set out the four main issues that need to be considered by the systems director as he or she plans the most appropriate organisational structure for the future. First, there is a need to recognise that different types of systems need to be managed in very different ways. Next, the most appropriate degree of centralisation must be determined. The changing role of the systems department must then be considered, together with the skills profile that this implies. Finally, procedures must be put in place for ensuring that staff appropriate to the new organisational structure and skills mix are selected.

We then conclude the report by describing the systems director's role implied by the new organisation.

RECOGNISE THE NEED TO MANAGE DIFFERENT TYPES OF SYSTEMS DIFFERENTLY

The systems department of the future will need to be organised so that it can cope with many different types of systems, and with many different types of management styles and business cultures. It will not be possible to manage all types of systems activities in the same way. In particular, it will be necessary to manage the innovative new uses of information technology in a different way from the way in which conventional systems have been managed in the past and will continue to be managed in the future.

Often, the new innovative uses of information technology are referred to as strategic (or competitive-edge) systems. However, there is a great lack of clarity in the way these terms are used, so before discussing them further we need to dispose of certain myths. Systems are not of strategic significance simply because they are computerised; nor are they necessarily so because they were historically very expensive to develop. Some companies have been strategically dependent on systems for decades, simply by virtue of their business characteristics: banks, insurance companies, and airlines are obvious examples. Without their records, they simply cannot trade. Increased strategic dependence on systems may arise because systems are used to manage operations, to control markets, to differentiate products and services – or a combination of any or all of these.

The issue of strategic dependence on systems has two important implications for the organisation of the systems department. First, the degree of dependence may to some extent resolve the question of centralisation versus decentralisation, which is considered in more detail later in this chapter. But second, strategic dependence on systems may make it necessary to differentiate between different types of systems, and to manage them in different ways. This differentiation is most clearly described by Jim Cash and Poppy McLeod (see reference 9), as shown in Figure 5.1, which identifies two phases in the introduction of a technology into an organisation. The first phase is concerned with the innovative use of technology to improve the effectiveness of the organisation; the second phase is concerned with using technology for control purposes (or improving efficiency). Each phase requires a different style of organisation, management control, and leadership, and the activities in each phase are carried out in different ways.

Figure 5.1 The two phases in the introduction of a technology

Distinguishing characteristics	*Phase*	
	1	*2*
Main focus	Innovation/ effectiveness	Control/ efficiency
Organisation	Organic	Mechanistic
Management control	Loose/informal	Tight
Leadership	Participative	Directive
Activity	Unprogrammed	Programmed

(Source: Cash and McLeod — see reference 9)

It is important to recognise that Cash and McLeod's phases are not a fixed sequence, with one always preceding the other. They may recur in cycles and may even coexist within the enterprise. In the minds of many systems directors and their staff, the rather hectic, action-oriented style of Phase 1 may have been typical of the systems department in the 1960s, but this style is now perceived as no longer appropriate for managing systems activities in the second half of the 1980s. Whilst this is true for the management of the mainstream systems activities, a Phase 1 environment may be highly appropriate for the creation of decision-support systems. Most revealingly, one systems director with a very successful record in the field of decision-support systems for sales and marketing management recently described his main task as putting a little excitement back into computing.

What is the implication of Cash and McLeod's classification? First, the systems director needs to recognise that in circumstances where the growing strategic dependence of the enterprise on systems means more effort being devoted to outward-looking, market-oriented applications, the traditional structure set up to deal with operational, large-scale computing may be wholly inappropriate. We believe that the systems director should recognise the need to manage Phase 1 systems differently and should set up a 'Phase 1 unit' within the systems department, with the task of tracking major new opportunities. It should be concerned exclusively with the future of the business. It should be run by a manager with a strong business background, rather than a technical background. It should transfer avant garde technology to the mainstream of the business as and when it can. It should nurture a frame of mind that is both challenging and irreverent towards the presumed eternal truths of the business. Above all, it should refer constantly to Moss Kanter's wry collection of rules for stifling innovation (set out in Figure 5.2) to check that it is not falling into the same traps.

Figure 5.2 Moss Kanter's rules for stifling innovation

1. Regard any new idea from below with suspicion: because it's new and because it's from below.
2. Insist that people who need your approval to act first go through several other levels of management to get their signatures.
3. Ask departments or individuals to challenge and criticise each other's proposals: that saves you the job of deciding; you just pick the survivor.
4. Express your criticisms freely and withhold your praise: that keeps people on their toes.
5. Treat identification of problems as signs of failure, to discourage people from letting you know when something in their area isn't working.
6. Control everything carefully. Make sure people count anything that can be counted, frequently.
7. Make decisions in secret and spring them on people unexpectedly.
8. Make sure that requests for information are fully justified: you don't want data to fall into the wrong hands.
9. Assign to lower-level managers, in the name of delegation and participation, responsibility for implementing threatening decisions you have made.
10. And above all, never forget that you at the top already know everything important about this business.

(Source: R Moss Kanter — see reference 10)

DETERMINE THE APPROPRIATE DEGREE OF DECENTRALISATION

The debate about the relative merits of centralising or decentralising computer resources is endless. It is not our purpose here to reiterate all the arguments on either side, but to try to understand the organisational dynamics within an enterprise that bear on this question.

In most organisations there will be a core of essential applications that will always have to be managed and operated centrally, but many systems activities can be considered for decentralisation.

James McKenney and Warren McFarlan (reference 11) and Niv Ahituv and Batami Sadan (reference 12) have classified the various types of pressures that promote centralisation or decentralisation (see Figure 5.3 overleaf). The relative weighting of these pressures will vary not only from enterprise to enterprise, but also with the technical and economic circumstances of the day. Twenty years ago, the cost of hardware so far outweighed everything else that technology was a dominant force. Similarly, when reliable operations were a rarity rather than the norm as they are today, data control was an overwhelming influence. Today neither of these factors is anything like as important.

We infer from the classification shown in Figure 5.3 that the most significant remaining arguments for centralisation are now associated with personnel and corporate-culture issues — both difficult to sustain with factual argument. The most powerful arguments for distribution focus on the unique needs of each group of customers and the paramount status of those needs as a guide to how resources are best used. They are an echo of the old colonial principle that the 'man on the spot

Figure 5.3 Pressures for centralisation and decentralisation

Pressure	*For centralisation*	*For decentralisation*
IS management control	To maintain a more professional, cheaper and higher-quality operation To achieve more flexible backup	To satisfy users' demands for better control, response times, and data entry facility To make costs more predictable To improve overall reliability
Technology	To make large-scale processing capacity available To use available power more efficiently	To benefit from the cost reductions in hardware To take advantage of reductions in telecommunications costs
Data control	To provide user access to common corporate data files To ensure data standards To maintain a high level of security To protect vital applications	To recognise the different needs for data, file access, and applications in the various user groups To fit better with the diverse needs of the operating companies To ensure high level of confidentiality To use ready-made applications
IS personnel	To create an attractive environment for specialised technical staff To reduce vulnerability to turnover of specialised staff To provide more and richer technical IS career path opportunities	To increase the stability of the workforce, away from other, competing, central sites To increase the transfer of expertise from IS staff to users and vice versa
Organisational fit	To fit the corporate, central, or functional structure and management practices To avoid disrupting the historic central IS position	To fit the organisation structure and leadership style of decentralised or geographically spread corporations To accommodate small number of users To fit the size and self-sufficiency of smaller organisational units

(Sources: McKenney and McFarlan, Ahituv and Sadan — see references 11 and 12)

knows best'. Once again, such arguments can rarely be proved conclusively. It is therefore no surprise that in most real-life organisations, some degree of centralisation coexists with some degree of distribution. It is, in our experience, just as rare to find a company with no central systems policies or resources as it is to find one with none at all in its strategic business units.

Perversely perhaps, the fact that hardly any enterprise opts for a wholly centralised or wholly distributed solution simplifies the debate. Everyone is dealing in trade-offs and compromise; the only question is where to draw the line. In a survey of 53 enterprises in the United States, an attempt was made to find a link between the organisational structure of the enterprise and that of its systems department (see reference 13). The three main conclusions of this study are not surprising, but they confirm the promptings of common sense:

- The degree of centralisation of the systems department is correlated positively to centralisation in the enterprise as a whole.
- The authors of the study measured the degree of integration achieved through the systems department in the enterprises studied. They defined integration as the accumulation in databases of data from different parts of the enterprise, and the use of systems in which the output of one system became the input of the next. Thus defined, integration occurs more readily in less centralised structures.
- The larger the enterprise, the less likely it is to have a single centralised systems department.

The systems director needs, therefore, to make a judgement about where in his or her organisation the line lies between centralisation and decentralisation, based on an assessment of the pressures

listed in Figure 5.3. The current tendency, partly prompted by technological change and the availability of the personal computer and its software, and partly driven by management fashions in favour of devolution, appears to favour distribution of the systems function.

At the Benelux Foundation Conference in 1985, Mr John Tholstrup of Kodak Europe gave some relevant examples of the beneficial effects of distributing the systems function, together with the necessary preconditions for attaining them (see Figure 5.4). It is obviously true, though easily forgotten, that although technological developments support and facilitate the delivery of such benefits, they do not guarantee them. The benefits of a distributed systems function, including those listed in Figure 5.4, can be secured only by the active and imaginative involvement of the management in the business units. The benefits of centralised systems can, to some extent, be imposed; those of distributed systems cannot.

In all the benefits of decentralising the systems function listed in Figure 5.4, the role of the systems department is to provide the necessary enabling technology and support. Given this support, the customers must play the main creative role. Thus the role of the systems department changes from that of main producer of systems to that of main coordinator and facilitator of their production. Current research has, to a considerable degree, found that if the systems department can successfully negotiate this transition to the new and more business-oriented role required in a distributed environment, there is a considerable increase in job satisfaction for systems personnel. In particular, the closer links with groups of customers creates a new flexibility in career paths. Moreover, the customers become more aware of the real cost of information systems, and hence contribute more realistically to the management of the systems resource.

But such gains are not easily won. If distribution is to work, the central systems group must not only maintain the capability to offer technical support to large units, but must also be able to provide practical help to small units whose systems resources may be negligible. The clearest possible standards and practices must also be established, in order to prevent distribution leading to a collapse of technical peformance. There must also be an effective means for disseminating information about systems activities across unit boundaries, in order to reduce the likelihood of different units duplicating each other's efforts. The central systems group must retain a monitoring and auditing role with regard to hardware and software. The central group must also see itself as, and be widely accepted as, the 'guardian of the future'. Left to their own devices, the business units will concentrate (understandably and laudably) on the application of today's technology to today's problems. Spotting opportunities for tomorrow, identifying technologies and applications that may be of fundamental importance in two or in ten years' time — these are critical tasks for the central systems group. The central group will also retain responsibility for the personnel management of all systems staff, whether employed at the centre or in the units, and for training of staff in the business units.

Figure 5.4 Some benefits of distributing the systems function

Benefit	*Necessary preconditions*
Organisation structures are flattened through the use of decision support	There is corporate control over the way in which the business units apply such systems
Need to transfer information is reduced because most data are processed and retained at the point of origin	There are strict standards set for the aggregation of data that will normally be sent upwards
Office productivity is increased through reductions in administrative groups	The systems department provides friendly, relevant software and training and helps eliminate redundant tasks
Centralised development teams disappear as local computing proliferates	Functional and business units are helped to manage their systems resources and apply them imaginatively to business problems
Centralised systems groups provide consultancy, training, and technical support both to internal and external customers	The systems department has established a good reputation with its customers and is recognised as a centre of excellence within the corporation

(Source: John Tholstrup, Butler Cox Foundation Benelux Conference, 1985)

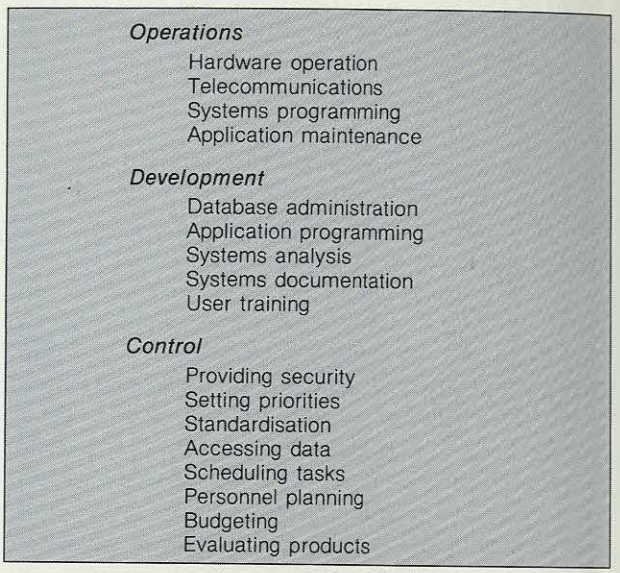
Under certain circumstances, then, and with carefully defined controls, the currently fashionable trend towards well-managed decentralisation of the systems function appears, in the literature and in practice, to offer certain benefits to the systems department itself and to its internal customers.

Jack Buchanan and Richard Linowes (reference 14) have provided a useful analytical tool for deciding which areas of systems responsibilities should be

centralised and which should be decentralised. They classify all the systems activities under three main headings — operations, development, and control. Figure 5.5 shows their classification. They also provide more detailed observations of how systems management tasks are allocated in practice. Figure 5.6 illustrates the centralised and decentralised organisation of tasks in six typical application areas within an airline, two manufacturing organisations, a retail store chain, a company with several divisions, and an international bank.

The examples shown in Figure 5.6 illustrate vividly the way different degrees of decentralisation will suit different business environments. Apart from the business sector involved, the most important factor will usually be the extent to which the business unit feels willing and able to sustain the extra responsibility, and to absorb the specialist staff necessary to do so. The transfer of responsibility can be phased, with control activities paving the way.

Figure 5.5 Areas of systems activity



(Source: Buchanan and Linowes — see reference 14)

CHANGES IN THE ROLE OF THE SYSTEMS DEPARTMENT AND ITS SKILLS PROFILE

If we (and other researchers) are correct in our forecasts about the integration of systems activities with the business, and the externalisation of some responsibilities, then certain consequences flow from those forecasts. There will be important changes in the way the systems department conducts its work and in the skills it will require. Some of these changes are set out below.

- The systems department plays an increasing role in addressing strategic business issues at board level, and learns to help and support top management.
- The systems department monitors and tests technological developments.
- Many more systems staff are integrated into the business units, but they receive technical leadership from the central systems group.
- The central systems group provides guidance on overall systems architecture, particularly for networking and databases.
- The central systems team strongly influences (and probably controls) group policy on hardware and software. Nonconforming purchases are not banned, but are made to look eccentric and costly.
- The systems department learns to integrate decision-support systems and intelligent knowledge-based systems with office systems and to encourage their use.
- The systems department becomes involved with all aspects of administration, including job structuring, organisation, and motivation. It usurps and updates the old role of organisation and methods (O&M) studies.
- The systems department counsels, trains, and educates its customers in how to identify new opportunities for exploiting systems.

In earlier chapters we have indicated where we think the present stance of the systems community is inadequate for, or even hostile towards, successful evolution into these new roles. Clearly, no particular organisational arrangements will in themselves guarantee success. The people and the skills are paramount. But if the organisational structure cannot make success a certainty, it can make failure highly likely if it constricts the performance of the team and inhibits the development of skills, leadership, and managerial competence. How does the systems community see its own requirements for training and development?

In 1985, a survey conducted by the French computer journal *01 Informatique* provided an interesting insight into the self-knowledge of its respondents. Respondents were asked if they thought their basic qualification would remain valid in 1990, provided they were kept up to date. Fifty-one per cent said yes; 41 per cent thought that their qualification would need to evolve to stay in line with the needs of 1990. Nevertheless, nearly half the respondents received no formal training whatsoever in 1985, and only 15 per cent received training in management or any subject outside their technical specialisation.

Figure 5.6 Examples of centralised and decentralised systems management activities

Organisation	Application	Operations		Development	
		Execution	Control	Execution	Control
Airline	Central reservation system	C	C	C	C
Manufacturing	Production scheduling	D	D	D	D
Retail store chain	Point-of-sale inventory system	D	D	C	C
Manufacturing	Accounts receivable	C	C / D	D	D
Divisional company	Payroll package	D	D	C	D
International bank	Funds transfer network	D	C	C	C

C = Centralised; D = Decentralised

(Source: Buchanan and Linowes — see reference 14)

Adding to the concern caused by these statistics, the survey showed that since 1983 (the date of the previous survey) a much larger proportion of the respondents had studied data processing at college. At a time when the main challenges facing the systems department are to broaden its managerial competence and to increase its understanding of business issues, there is some evidence that it is becoming even more technically oriented than before.

What kind of people are really needed, and what skills must they have, if the systems department is to be successful in its new roles? We turn again for guidance to the paper delivered by Anthony Bargioni at the Gleneagles Foundation Conference in 1985. Anthony categorises the four skills areas in which systems staff must improve as business knowledge, understanding of corporate culture, the ability to earn the appropriate status, and maturity.

Systems departments have generally been absorbed in acquiring technical knowledge and have neglected the need to understand the realities of the businesses in which they work. At present, the culture of the systems department is determined largely by the needs of the technology. The computer requires perfectly articulated solutions and uncompromising implementation. On the other hand, the culture of the business requires working with imperfection and imprecision; the realities of business life are not clear-cut. In many enterprises, the status of the systems function is determined by its cost level, its organisational disturbance, and its questionable performance. It has not earned sufficient status to be able to influence the enterprise's policy. To earn the required status in the eyes of the business, the systems department must be able to demonstrate a maturity that it does not yet possess.

Anthony Bargioni's views are sharp and strongly held. They are presented here not as research-based findings, but as the opinions of one highly experienced and perceptive practitioner of the art of systems management. Each reader must reflect on how far these views, and the prescriptions that flow from them, apply within his or her own organisation.

SELECTING THE RIGHT STAFF FOR THE NEW ENVIRONMENT

Fitting the right people to the right jobs is a complex task, and in recent years more use has been made of psychological profiling. One of the established methods is known as the Myers-Briggs Type Indicator, evolved from theoretical work originally carried out by Jung himself. Each person is typed by measuring four personality characteristics. Each characteristic is plotted between two extremes:

- Introversion versus extroversion.
- Sensing versus intuition.
- Thinking versus feeling.
- Judging versus perceiving.

During the early 1980s, a three-year survey of systems professionals was conducted in the United States, the United Kingdom, and Australia to measure their personalities and work preferences. (The results of this survey were reported by Michael Lyons — see reference 15.) Every individual has a unique score in the assessment, but if the kind of people currently attracted to systems careers can be understood better, there is a greater chance of remedying any deficiencies and organising the people to give the highest chance of success. We show in Figure 5.7 the aggregated

Figure 5.7 Personality characteristics of systems staff compared with those of the general public

Characteristic	*Percentage displaying characteristics*	
	Systems personnel	*General public*
Extroversion / Introversion	33% / 67%	66% / 34%
Sensing / Intuitive	46% / 54%	75% / 25%
Thinking / Feeling	81% / 19%	60% / 40%
Judging / Perceiving	66% / 34%	50% / 50%

(Source: Michael Lyons — see reference 15)

personality characteristics for the systems community, compared with the profile for the general public.

Compared with the population at large, systems staff include a disproportionate number of introverts and intuitive, judgemental thinkers. Perhaps the special nature of the work attracts a special kind of person. The untested belief in the minds of many people that systems staff are somehow 'different' turns out to be objectively true. The figures are aggregated, however. It is by no means impossible that within the totals there are enough 'normal' people to communicate with the world outside the systems department. They simply have to be identified.

A tendency to one extreme of each of the personality characteristics causes definable problems for the systems specialist seeking to work alongside 'normal' people. For example, a high rating on the axis towards introversion makes communication with anyone other than oneself difficult. A strong tendency to be intuitive, rather than sensing, may make the topic seem unworldly, although a strong bias towards intuition leads to imagination and creativity. A strong inclination toward thinking, rather than feeling, can lead to management difficulties and alienation of personal contacts. And a tendency for judging rather than perceiving may create an impression of superiority and condescension.

The results of the survey were encouraging in one respect, however, because 40 per cent of the sample had a combination of personality characteristics that is ideally suited to many of the traditional tasks of the systems department. In fact, the statistics suggest that the systems recruiters around the world have done an outstanding job in finding the right people for the tasks that used to dominate the work of the systems department. The difficulty facing most systems departments today is how these same groups of people can be reorganised to meet the new demands.

Clearly, it is quite hopeless to expect the introverted, intuitive, thinking, judging systems professional to change his or her personality overnight by an act of will. Equally, it is absurd to imagine that an extrovert, sensing, feeling, perceiving sales manager will acquire the attributes of a poet or philosopher (or even of a systems analyst). Moreover, in a situation where people appear to have gravitated, more by luck than judgement, to kinds of work for which they are temperamentally well suited, it would be madness to expect all of them to change. By definition, if they succeeded in changing, everyone would be in the wrong job. But it is also unhelpful to fall back on the old cliché that people do not change. They can and do. Otherwise, what are training and experience for? The extremes of behaviour and attitude can be moderated by creating an environment that rewards such change. It is not easy, as our case history describing Volvo's experiences demonstrated. The important point is that the necessity for new patterns of behaviour and new attitudes should be clearly understood.

If it is true that most of the people entering the systems department are biased towards a particular mindset well suited to solitary problem-solving, then it is not surprising that the department is short of good middle managers. Compared with other departments, it will have less promising material. Those few who possess managerial talent will feel like misfits, and may move on. In the next, and final, section of this report we argue that the systems director in any organisation should be distinguished for managerial, rather than for technical, skills. By the same token, the systems department must ensure that parallel career paths exist both for the first-rate technologist and for the outstanding manager. It is very easy to turn a good technician into a bad manager, and to judge a potential manager only by technical criteria. Both errors force people into the wrong jobs.

THE ROLE OF THE SYSTEMS DIRECTOR

Throughout the literature we have studied, there runs a common thread of criticism of the systems director. It seems that it is in the very nature of the systems function that its leader should be subjected to a familiar litany of accusations. Projects run late and are over budget. The systems department is in conflict with company policy and practices. The department is fascinated by

technology and unresponsive to business needs. *EDP Analyser* recently asked a sample of data processing managers to list the major changes they expected (or perhaps hoped for) in their jobs. Their replies (listed in Figure 5.8) show that they know well the tenor of the criticism so often levelled against them.

Jack Rockart (see reference 16) has identified four areas to which the systems director should pay urgent attention, namely service, communication, human resources, and the repositioning of the systems department. These areas are remarkably similar to the priorities expressed by Anthony Bargioni in his Gleneagles Foundation Conference presentation already cited.

By service, Jack Rockart means both the delivery of the service in ways that are effective and efficient and also the management of the way the service is perceived. Perception is created by communication, a two-way process that is beyond the capability of the old-fashioned, isolated technician. Human resources are the key to providing the right kinds of service. There will be a premium on people who are both technically literate and managerially competent.

Rockart assumes a binary organisational structure, with the old-fashioned 'Cobol shop' coexisting alongside the new, business-oriented unit. The systems function is repositioned (or, as Anthony Bargioni would say, gains status) by promoting the role of customer computing; by reorganising itself so as to bring systems into the mainstream of the enterprise; by taking charge of wider needs for information in the business than were met by traditional data processing; and finally by transforming the systems department from a production unit for applications to a high-grade sales, marketing, and service operation. From his observation of companies that have reached maturity in systems, Jack Rockart has deduced a set of critical success factors (or actions) corresponding to each of the four priority areas. They are set out below.

Service: techniques are required for measuring users' perceptions of the service (sign-off inquiry on terminals, questionnaire or interview surveys, etc.).

Communication: certain actions are required to ensure the critical success factors for communications:

- Ongoing strategic planning should be carried out by the systems director.
- Systems directors should report to the top of the organisational pyramid.

Figure 5.8 Job changes expected by data processing managers

Business trends are leading companies to look to information technology as a competitive weapon; competitive use of information technology requires business understanding to anticipate new opportunities.
Setting priorities for high-leverage applications requires a sound business outlook.
The two-to-three-year known application development backlog that is not getting shorter, and a huge hidden backlog, are leading users to ask for direct access to computer systems.
Selecting the right new techniques.
Attracting and keeping systems people with a creative and innovative approach.
Defining one's own role as a data processing manager in response to the pressures from subcontractors, suppliers, users and top executives.
Defining security and backup procedures and requirements.
Managing large-scale projects. The better project managers have been promoted, and, hence, packages seem to present an attractive and faster solution.
Keeping up-to-date with technological developments.

(Source: *EDP Analyser*, June 1984 extract)

- Steering committees should be established.
- Informal contacts within the organisation should be established.
- A top management systems team, consisting of an executive officer for user contact and an operating officer for internal systems management, should be established, leaving general issues of corporate management to the systems director.
- Systems development staff should report to, or be aligned with, user groups.

Human resources: the following actions are required to ensure the critical success factors in the area of human resources:

- There should be clear career development plans for systems staff.
- Systems staff should be interchanged with the rest of the organisation.
- The number of systems personnel with a generalist, managerial focus should be increased.
- The image of the systems department as a reservoir of talented people for the organisation should be promoted.

Repositioning the systems function: key actions required to reposition the systems function in the eyes of the enterprise are to:

— Develop methods to manage data as a corporate resource.

— Create new methods to further the development of decision-support systems for managers (establishing separate user-support organisations, for example).

— Transfer systems development staff and hardware to divisions and functional departments.

— Focus on the development of methods to disseminate computer technology in the enterprise.

Implicit in Rockart's analysis is the important assumption that when systems resources are widely distributed throughout the organisation, it will be impossible for the systems director to control them from the centre. Measured purely by the number of people controlled, therefore, the power of the systems director will decline. But this decline will be more than offset by increasing responsibility in other fields, especially in the management of networks, data, processing power, and software development methods. From the office of the systems director will flow advice, guidance, and (where appropriate) rules concerning longer-range developments, communication and training, standards, security, and imminent technologies. By sacrificing part of his or her detailed control over the present, the systems director becomes a worthy custodian of the future. We close this report with a profile of the systems director of the 1990s — a portrait of a paragon.

The systems director is:

— Seen as a corporate officer, a manager among managers.

— Technically competent, but not first and foremost a technician.

— A candidate for a top management job.

— Essentially a communicator, with a message for the enterprise.

— An ardent participant in the battle to accomplish goals.

— Keenly aware of his or her own critical success factors.

— Working full-time on securing improvements in each of the above areas.

Anything else is a waste of time.

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