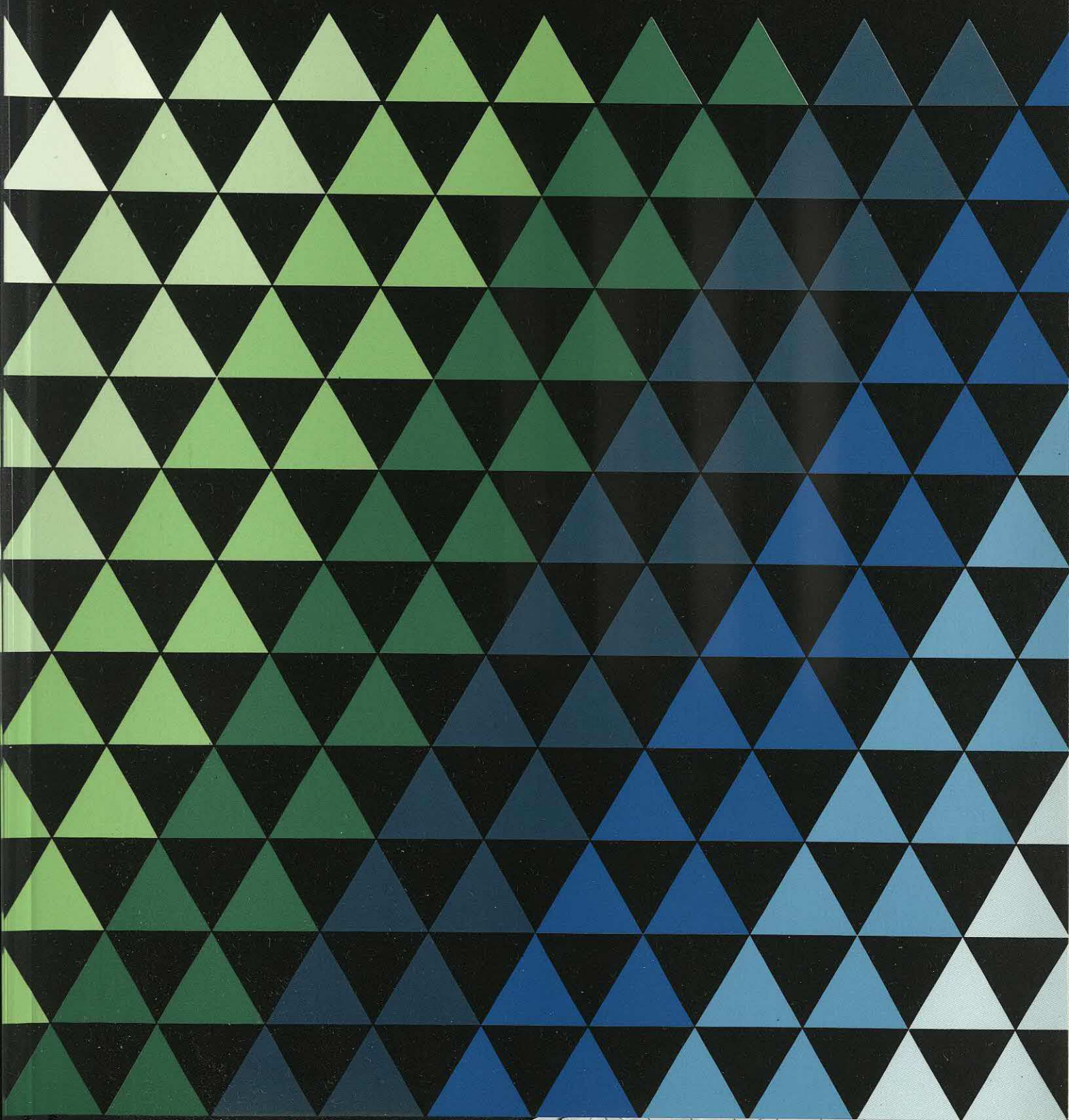
Staffing the Systems Function

BUTLER COX FOUNDATION

Research Report 71, September 1989



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Contents

A Management Summary of this report has been published separately and distributed to all Foundation members. Additional copies of the Management Summary are available from Butler Cox.

Report synopsis

The real value of investments in information technology will derive from the people who are employed to provide systems services. At present, however, there are shortages of people with the skills that have traditionally been regarded as essential to provide such services, and these shortages are likely to become even more acute in the future, particularly as the role of the systems function becomes more business-oriented. The conventional approach of paying higher salaries does not reduce staff turnover. Systems directors must therefore seek to minimise the inconvenience caused by the skills shortage and the consequent high rates of staff turnover by adopting alternative methods of staffing the systems function and creating a working environment in which staff are encouraged to build a long-term career. The report provides guidance on how systems directors can fulfill this critical management obligation.

Chapter 1

Understanding the importance of staffing issues

For most Foundation members, information technology (IT) has become the backbone of business operations, and the success of their businesses is becoming increasingly dependent on the quality of their information systems. It is, however, unlikely that business success will ever depend entirely on investments in technology. On its own, the technology can do little more than sustain an operation. The real value of the investment in IT will derive from the people who are employed to provide systems services.

The effects of staff shortages are potentially destabilising

The problem is that because the use of IT is growing at such a consistently high rate, and because the speed of technological change is unprecedented, there will continue to be shortages of skilled staff. Since the business and technological environments are likely to continue to change, these shortages will undoubtedly persist. The current shortages seem to be most pronounced in the areas of networking and fourth-generation software technology; in the future, the shortages may shift to other areas. Employers have not been enthusiastic about training people to fill the gaps because of the high costs involved and the fear of subsequent staff losses. This situation is illustrated overleaf in Figure 1.1. In the future, demographic changes will tend to make the problem even more acute.

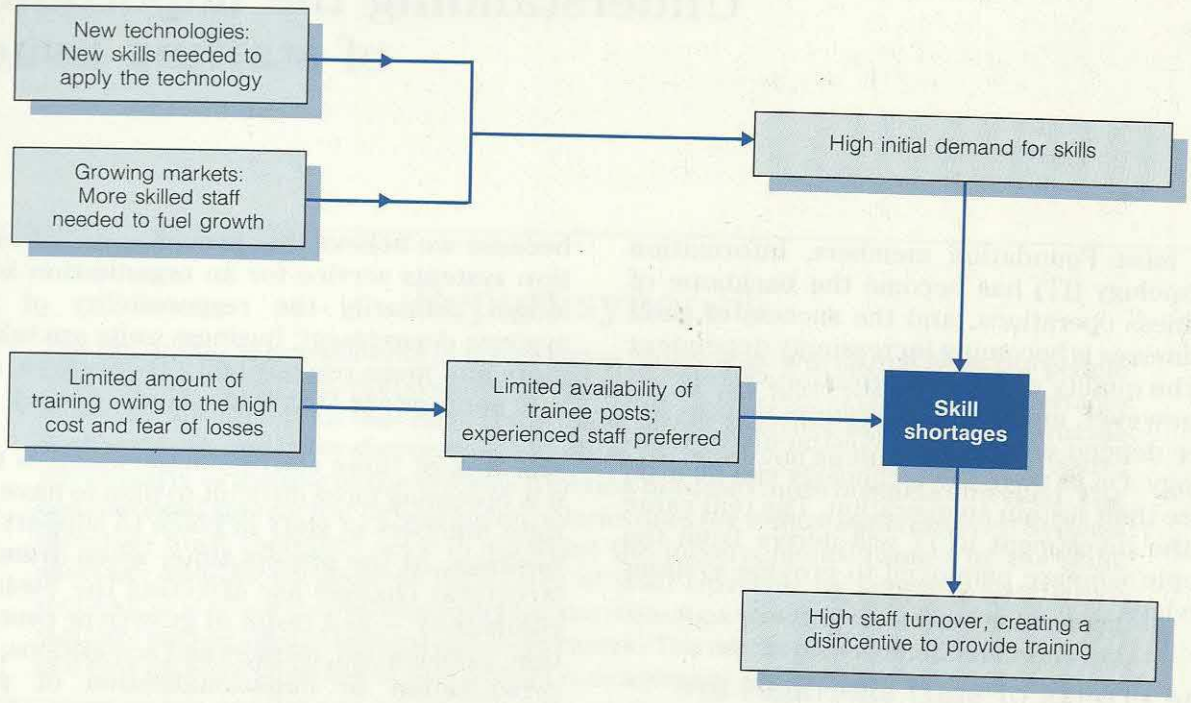
The problems that staff shortages are creating for the systems manager are compounded by the growing trend for information systems to be more closely aligned with the business that they support. This trend has two quite dramatic implications for staffing the systems function. (We use the word '*function*' deliberately here, because we believe that providing an information systems service for an organisation is no longer primarily the responsibility of the systems *department*; business units are taking more and more responsibility themselves, and it is appropriate that they should do so.)

The first of these staffing implications is that it is becoming more difficult to plan to have the right numbers of staff in place to support the business. At the present time, when dramatic structural changes are affecting the business community — as a result of growth or contraction, globalisation, mergers and acquisitions, and privatisation or denationalisation of state enterprises — the effects on staffing can be quite profound and are notoriously difficult to predict. No industry is immune to such changes.

The second is that the mix of skills that has served the systems department well in the past is no longer appropriate. In support of the objective of providing a better service to the business, many organisations have devolved large numbers of systems staff to business units. Not only does this provide greater flexibility, but it enables the local systems manager to get closer to business managers and to understand their needs. The objective of offering the business a better service also implies a far greater need among systems staff for highly developed business and interpersonal skills. At the same time, advances in technology have reduced the need for technical skills. While the need for technical skills will never disappear, the systems function will, in the future, need to be as strong in business skills as it has traditionally been in technical skills.

Devolution of systems skills works well for some organisations, but not for others. There are numerous instances of markedly increased rates of staff turnover immediately after such a

Figure 1.1 The skills shortage will last as technology continues to change and the demand for skills increases



(Source: Virgo, P. *The IT skills crisis: a prescription for action.* Manchester: NCC Publications, 1987.)

re-organisation has taken place. While this is perhaps to be expected in the short term, because of the uncertainty and confusion that reorganisation creates, it will tend to continue in the longer term if staff perceive their career opportunities to be limited to the decentralised unit in which they currently work.

Staff-turnover rates amongst systems staff are very high as a result of the severe skills shortage. One very damaging consequence is that the real cost of staffing the systems function is likely to increase. Evidence for this is provided by the Butler Cox Productivity Enhancement Programme (PEP), which now has a database containing details of several hundred development projects. Analysis shows that the Productivity Index (a measure of the internal productivity achieved by a development team in producing applications) averages 16 for those development departments with a staff turnover of less than 20 per cent, falling to 14 for those development departments with a staff turnover greater than 20 per cent. The difference is great because the index is measured on a non-linear scale; for the average PEP project of some 70,000 lines of code, the value of this difference is about $250,000. When the cost of recruitment is added to this, the effect of turnover on the cost of staffing the systems function can be seen to increase the true cost of staffing very significantly.

The common response — to pay higher and higher salaries in an effort to attract and retain staff — is not a long-term solution. The time has come for senior managers to accept the fact that staffing issues deserve, and indeed, warrant urgent attention. If managers fail to recognise this, staffing problems will begin to affect the stability of businesses, which are becoming more and more dependent on the support provided by their information systems.

Systems management is still too preoccupied with technology

Computer suppliers are fond of pointing out that the falling cost of hardware supports the case

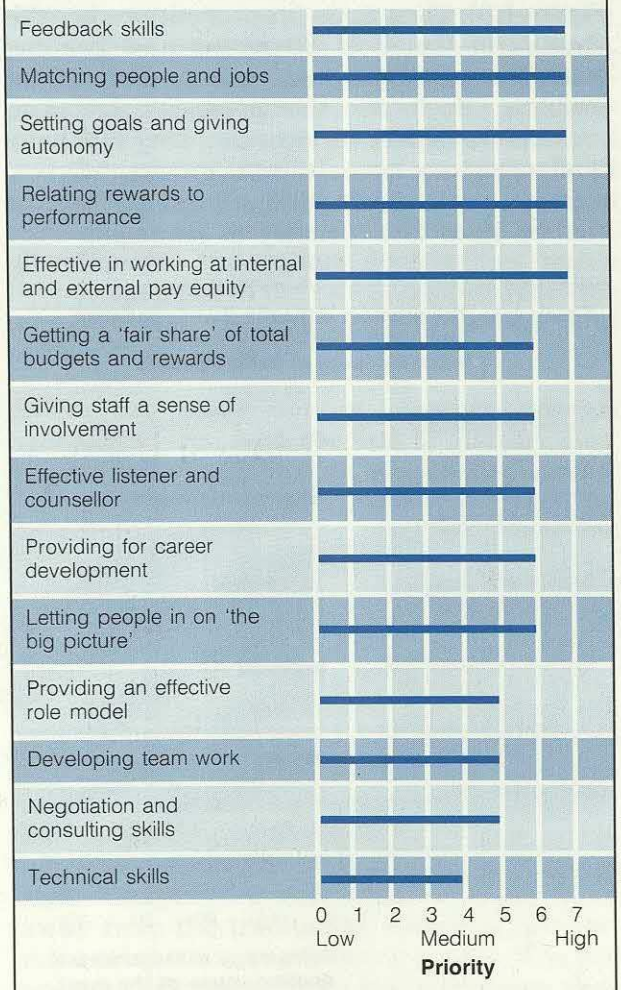
for greater investments in technology at the expense of human resources, which are depicted as an ever-rising cost. Their argument is misleading. Our research indicates that the proportion of the systems budget devoted to staff has stayed at around 40 per cent in Europe and the United States for the last few years. Expenditure on computer hardware represents a similar proportion of the total systems budget, but attracts a far greater proportion of management attention in most companies.

This management preoccupation with technology, at the expense of staffing issues, is having an impact on the effectiveness of the systems function and is putting the credibility of the systems department at risk in many organisations. We began Report 66, *Marketing the Systems Department*, with a quotation from one of the systems directors who participated in that study. His words are entirely relevant here, too. He told us, "It is quite impossible to be a good systems director. The skills required are too many and too varied. You have to be technically aware, good at handling and managing staff, sound on general management and financial control — and finally, good at sales and marketing. No-one has all those attributes." For the purposes of this report, this quotation highlights two points. First, the speaker mentions the need to be good at managing staff, but second, and perhaps of greater significance, he talks about the ability to handle staff *after* the need to be technically aware. This is an increasingly inappropriate, although not uncommon, allocation of priorities.

Traditionally, systems managers have been promoted into their positions on the basis of their technical skills, rather than their management skills. Often, they look for job satisfaction in technical areas; they consider managing staff to be a less pressing need. Our research has indicated, however, that a management concern for the needs of staff is likely to be the most critical factor in successfully staffing the systems function. In their classic book, *In Search of Excellence*, Thomas Peters and Robert Waterman found that, in most successful companies, the organisation was 'people-oriented'. Managers in these organisations were promoted on the basis of their ability to manage and motivate people. In less successful companies, the overriding concern of management was with capital investment and the production process.

Research carried out by Professor Robert Zawacki, a human-resources consultant, in which he asked systems staff to comment on the attributes required to be an effective manager, revealed that effective managers need have only an average level of technical skill but are expected to be above average in interpersonal and management skills. Figure 1.2 summarises the results of his research. Yet, because of their backgrounds, most systems managers' main objective is to keep up to date with the technology. Managers with this technical bias are failing to meet the needs of their staff.

Figure 1.2 Systems personnel do not consider technical skills a high priority for an effective manager



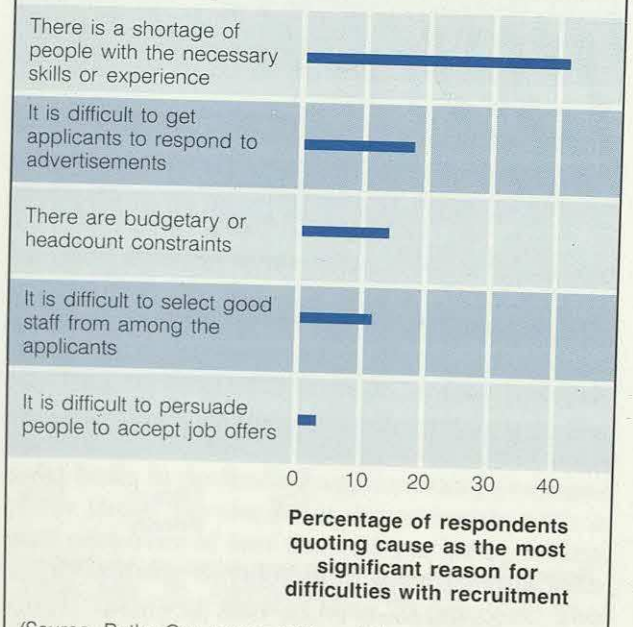
(Source: Zawacki, R A. How to keep eagles: can you hold on to the best programmers on your staff? *Computerworld,* 27 July 1987, pp. 51-57.)

Staff planning must become an urgent management priority

There is a body of opinion that maintains that all planning in the context of staffing the systems function is fruitless, because the demands placed on it are constantly changing, and there is no way of knowing what opportunities will be available for career development. We subscribe to neither of these views. There is ample evidence to show that planning does help organisations to cope with change.

The problem lies in the fact that systems managers are taking too short-term a view. The responses to the questionnaire distributed at the beginning of the research for this report showed clearly that Foundation members are having difficulty recruiting systems staff (see Figure 1.3). Their main preoccupations are the short-term issues of attracting and keeping staff. These are, however, symptoms of a larger problem. Such are the pressures on most members to deliver services that very few have undertaken any longer-term assessment of their staffing needs. One systems manager told us that he gave little priority to managing staff because he felt that he could play only a very limited role. He believed that the culture of his organisation was working against him, and he found it very difficult to encourage the right staff to join. He could not pay them enough, their career prospects were limited, and if they did make a commitment to join, they were unlikely to stay. His annual staff turnover rate was more than 30 per cent.

Figure 1.3 **The greatest difficulty that Foundation members have in recruiting systems staff is the shortage of skilled people**



(Source: Butler Cox survey of Foundation members)

By taking such a short-term approach, systems managers are condemning themselves to searching continually for fully experienced staff, who can be put to work immediately in order to preserve the integrity of the software-development plan. In such a situation, they will be restricting themselves to a limited source of potential recruits, and their staff turnover rates will remain unacceptably high. Systems managers must seek to minimise the inconvenience caused by the shortage of skills and the high rates of staff turnover by adopting alternative methods of staffing the systems function, and by providing a working environment in which staff are encouraged to build a career. Business changes do not make this any easier, but neither are they a reason to neglect this critical management responsibility. Taking a longer-term view of staffing issues will demand a great deal of management time and commitment, but the investment will be justified if staff who are suited to the new demands being made of the systems function can be recruited and retained.

Purpose and structure of the report

This Foundation Report does not cover a novel subject, as many have done. It addresses a subject that has been widely discussed for many years, but that is now of critical concern to systems managers. Staffing issues have been mentioned in several recent Foundation Reports, notably Report 65, *Network Management*, Report 66, *Marketing the Systems Department*, and Report 69, *Software Strategy*. This is the first time, however, that we have devoted a full Foundation Report to the subject.

Its purpose is to help systems directors understand better why they have recruitment problems and what practical steps they can take to prepare for the more demanding role that the systems function will be required to play in the

future – as one Foundation member put it, the aim is "to have the right numbers of staff, in the right jobs, at the right time, doing the right work in the most cost-effective manner". There are no universal solutions to the problems of staffing the systems function. Much depends on circumstances, on needs, and on the nature of the organisation. In this report, we have drawn on the experience of businesses that have assisted in the research, with a view to providing insights into best practice in staffing the systems function. The research team and the scope of the research carried out for this report are described in Figure 1.4.

In its future role, the systems department will have a very different relationship with the business functions from the one that has been common in the past. As the business functions become equipped to provide many of their own requirements, the systems department will take on new roles. We discuss both this new relationship and the implications for the roles that each partner plays in it, in Chapter 2. The new relationship also implies the need for a more systematic approach to staff planning in the systems department.

Figure 1.4 Research team and scope of the report

This report is based on an extensive programme of research carried out by Butler Cox. We received 125 responses to the questionnaire sent out to Foundation members at the beginning of 1989. They provided a substantial amount of information about the problems and concerns of members, who together employed some 50,000 systems staff. The responses to the questionnaires led us to seek the views, opinions, and experiences of 50 organisations through a series of structured interviews and research workshops that were held throughout Europe and Australia.

We also sought the opinions of specialists in the field of staffing — recruitment companies, academics, training specialists, selection specialists, and human-resources practitioners. Published material was also a rich source of information. As well as the wealth of statistical information that is available on demographic trends, there is hardly a journal or newspaper that does not have something to say about staffing, and we have drawn heavily on this source of empirical evidence in seeking out best practice. A bibliography of the material we referred to is included at the end of the report. We also drew on the experience gained from Butler Cox's consultancy work, particularly in the area of systems and organisational strategy work.

The research was led by Graham Otter and Daphne Leggetter, both senior consultants with Butler Cox in London. They were assisted by Chris Woodward, also a senior consultant in London, and the Foundation managers throughout Europe and Australia. A notable contribution was made by John Cooper in Australia, who was carrying out consulting work in the staffing field during the period of the research for this report.

In view of the shortage of skilled systems staff, and of the need for a changing mix of skills that the changed relationship with the business implies, systems managers will need to seek recruits to the systems function from a broader base than they have traditionally relied upon. In Chapter 3, we suggest how they might extend their recruitment base. However, identifying new sources of staff does not guarantee that the right staff are selected. We demonstrate the merit of taking a marketing approach to recruitment, and making use of established methods to improve the selection process.

In Chapter 4, we consider the management and motivation of the staff who have been selected. We show how goal-setting and feedback techniques are essential, both to systems staff, and to managers with responsibility for optimising performance, and illustrate the improvements in performance that can be encouraged by the proper use of performance-related payment systems. This chapter also contains guidelines on instituting effective career-development and training programmes, which will be essential as the career opportunities for systems staff become more business- and management-oriented.

There are other options open to systems managers faced with the task of staffing their departments to provide an adequate and timely service to the business. They may usefully plan to complement in-house staff with external service providers. We describe the types of service providers available in Chapter 5, suggest when it might be appropriate to use them, and examine the implications for in-house staff.

These practical guidelines for staffing the systems function can be successfully put into practice only in a working environment which is conducive to advancement and innovation. Such an environment depends to a large extent on organisational planning and management style. Chapter 6 is concerned with the move away from the traditional, technical management orientation to a focus on people. This will provide businesses with the advantage they need to recruit good systems staff in a labour market that is becoming more and more competitive.

Chapter 2

Defining staff skills and numbers

The increasing demand for new systems in most organisations means that it is crucially important for the systems department to predict accurately the types and numbers of staff that will be required. In this chapter, we describe the skills that are appropriate to today's systems department and suggest a procedure that has proved very successful in predicting staff numbers.

One of the major problems facing systems directors today is that the role of the systems department is changing, and users are taking on responsibilities that traditionally belonged to the systems department. As a result, there is a need to clarify the respective roles of the systems department and system users. Defining the roles in terms of a partnership, in which the responsibilities of each partner are understood, will place an organisation in a strong position to exploit the opportunities provided by information technology. One implication of the new role of the systems department is that systems staff have to be equipped with different skills. Increasingly, non-technical skills are required, even in the more 'technical' jobs such as systems maintenance, so that systems staff can communicate effectively with system users and understand the business context in which computer systems are operating.

Predicting the number of staff that will be required in six months' or a year's time is not easy. However, it is increasingly important that such forecasts are made because, as the results of our survey showed, most Foundation members are having difficulty recruiting systems staff. Linking the process to the business- and systems-planning cycles should enable systems directors to make reasonably confident estimates for the next three years. This will allow them to make informed decisions about the best way of staffing the systems function to meet future requirements, through the optimum mix of planned recruitment campaigns, training of existing staff, or use of external services suppliers.

Control is devolving from systems staff to users

One of the main management issues now facing systems directors in many organisations is the increasing willingness and ability of system users to accept responsibility for developing application systems and operating the hardware on which the applications run. Most Foundation members consulted during our research reported an increasing involvement of user staff and an increase in 'information technology literacy', a trend which they expect to continue. This shift in the responsibility for managing software and hardware has been encouraged by developments in the technology (such as cheaper hardware, the development of telecommunications, and the widespread introduction of personal computers), which have made local processing possible. A recent European survey showed, for example, that the number of workstations had increased from one for every six white-collar employees in 1985, to one for every three employees in 1988. During the same period, the increased availability of commercial software packages and fourth-generation languages has made it easier for users to implement, develop, and run their own systems.

Responsibility for developing computer systems has, in fact, never been the sole responsibility of computer 'specialists'. For up to a decade now, smaller companies have been installing and running their own minicomputer- and microcomputer-based business systems without having to employ dedicated systems staff. A good example of this is IGIRS (a French pensions

company with 230 employees), which has never had an established systems department. This company uses minicomputers, and the 170 system users have had to acquire the development tools and applications knowledge themselves. IGIRS describes itself as "a very computer-literate company, whose mission is to have users who are also IT-informaticians". Today, however, even organisations with a large systems department are finding that the traditional role of the department is changing.

To put the changes into context, we have classified the evolution of the systems department's responsibility for providing information systems to users into four stages: efficiency, effectiveness, competitiveness, and infrastructure. The characteristics of each are listed in Figure 2.1, and they are described below:

- *The efficiency stage*: In the 1960s, business systems were run on mainframes, networking did not exist, and the main role of systems was to speed up clerical tasks. The systems department was autonomous, with complete control over all computer hardware, software, and resources. The main skills required by systems professionals were in applications development and systems programming, and there was virtually no opportunity for career advancement outside the department. The role of the users was confined to preparing data and learning to use the printed outputs.
- *The effectiveness stage*: During the 1970s, the introduction of minicomputers and internal networking gave users direct access to information held on computers. Computer systems began to increase effectiveness by enhancing the scope of jobs. The systems department still retained some degree of autonomy, particularly in its control of resources, but user input was increasingly sought to define requirements and ensure that systems were introduced effectively. The skills required by the systems department were still predominantly technical, and the main career-development paths related to the core technical work — designing, developing, and running systems.
- *The competitiveness stage*: During the 1980s, the extension of networking to link external customers and suppliers to the organisation began to change the way businesses operate, and the availability of cheap personal computers, commercial software packages, and fourth-generation languages gave users the tools to build systems for themselves. Systems became increasingly important in making new ways of operating possible, rather than in supporting existing ways of operating. The systems department's role has become largely one of coordinating the individual initiatives to ensure that they remain compatible, so that applications can be integrated in the future. The skills required are increasingly non-technical, with business knowledge and interpersonal skills becoming important. Career moves between business and systems departments are becoming more common.
- *The infrastructure stage*: The next stage of evolution in the 1990s will see an increase in intercomputer networking to link separately developed software systems, and

Figure 2.1 The systems department's responsibility for providing systems has evolved through four stages

	1960s: Efficiency stage	1970s: Effectiveness stage	1980s: Competitiveness stage	1990s: Infrastructure stage
Technology advance	Business mainframes No networking	Minicomputers Internal networking	Personal computers External networking	Intercompany networking
Skills	Technical	Predominantly technical	Hybrid	Predominantly non-technical
Careers	Limited	Monolithic	Hybrid	Multiple
Role	Autonomous	Autonomous/ coordinating	Coordinating	Partnership

so enable integrated corporate-wide systems to be implemented. The emerging pattern in large corporations is a combination of distributed processing with access to central databases, and a critical dependence on networks. The role of the systems department will evolve to become a 'partnership' with users to exploit these opportunities. The skills required will no longer be predominantly technical, and career opportunities for systems and user staff will be increasingly interchangeable.

Even in businesses with a high level of participation by users in the systems development process, however, systems development responsibilities have not devolved entirely to users. In the first Foundation Directors' Briefing, *Managing Information Systems in a Decentralised Business*, published in March 1989, we classified the responsibilities of the systems department into four categories, which are reproduced in Figure 2.2. Our research has shown that devolution is taking place in the third category, developing staff, and in the fourth, developing and operating business-unit systems. This distinction is important, because it provides a framework for clarifying the changing roles and responsibilities of staff involved with the systems function.

Figure 2.2 The responsibilities of the systems function can be classified in four categories

Delivering head office services
- Providing systems for head office
- Providing group-wide networking
- Making central bureau services available
- Organising central purchasing of equipment
- Developing systems shared by business units
- Watching trends in information technology

Setting strategy, policy, and standards
- Integrating information systems and business-unit planning
- Monitoring competitors' use of information technology
- Maintaining a strategy for information technology
- Defining technical architectures
- Defining standards and interfaces
- Defining policies and methods
- Reviewing systems development plans
- Auditing quality and security

Developing staff
- Building management awareness of information technology
- Promoting and catalysing the use of information technology
- Training staff in the use of information technology
- Recruiting and developing information systems staff

Developing and operating business-unit systems
- Budgeting and planning
- Designing and implementing systems in accordance with policy and standards
- Buying and operating hardware and software
- Maintaining systems
- Providing support for end users

Changing roles and responsibilities should be clarified

There is evidence to suggest that, where it is happening, devolution does not always take place in a controlled way. One member described 'grey' areas of responsibility and 'informal understandings' between the systems department and users. Another told us that devolution in his organisation had gone too far and he wanted to start reversing the process. A director of IBM France saw the distribution and division of responsibility between user management and systems management as a significant problem area. Clearly, there is a need to create a formal management structure to enable a productive working partnership to emerge.

A useful model to adopt is to divide systems into two types, core and non-core applications. In Report 69, *Software Strategy*, published in May 1989, we defined core applications as those that are essential to the day-to-day operation of the business. In general, they maintain and update the common corporate databases, and often provide a base for subsequent applications to use. Non-core applications, on the other hand, while they may be essential to run the business efficiently, are specific to a particular business unit and do not normally affect the day-to-day operations of other departments. The software itself does not form a building block for other departments' applications. Figure 2.3 illustrates this distinction.

Clearly, skilled technicians are needed to develop core systems, which exploit database technology and commonly process high volumes, if they are to be developed and run efficiently. The systems department can also ensure that these applications are designed as part of a coherent software infrastructure so that they will be compatible. Development of non-core applications, where processing efficiency is usually less important than business effectiveness, can be controlled by users, either

by exploiting the facilities provided by fourth-generation languages or commercial packages, or by calling on the services of the systems department.

The roles and responsibilities of all staff involved with the systems function can now be clarified, using the categories of responsibility illustrated in Figure 2.2. The central systems department should continue to be responsible for delivering head-office services, which includes development of core applications, and for setting strategy, policy, and standards. Its overriding responsibility should be to formulate and implement technical and software policies to ensure that the infrastructure stage of the 1990s will be able to progress, unhindered by technical incompatibility between the distributed software or hardware resources. The responsibility for developing staff divides naturally between the systems department and users, with user managers taking the lead in promoting the use of information technology and ensuring that staff are trained in its use. The responsibility for developing and operating the non-core business-unit systems can be devolved almost entirely to system users, with technical and development support being provided, as required, by the systems department. This division of responsibilities, which is illustrated in Figure 2.4, explicitly recognises the increasing ability of users to take responsibility for providing their own computing needs.

Figure 2.3 There is a clear distinction between core and non-core applications

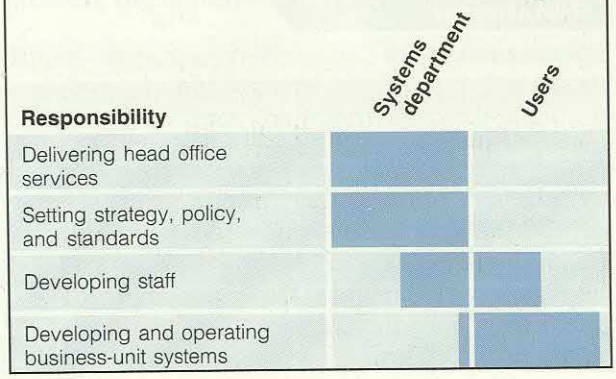
	Core applications	Non-core applications
Driven by:	Technology	Business objectives
Developed by:	Experts	Users
Justified by:	Business risk	Benefits
Retail bank	ATM system	Spreadsheets
Retailer	Point-of-sale system	Supplier analysis
Manufacturer	Process control	Product list
Distribution company	Order processing/ stock control	Sales and marketing statistics
Public utility	Customer billing	Personnel management
Insurance company	Policy database	Quotations

Some organisations are already beginning to allocate systems responsibilities in the way shown in Figure 2.4. Ciba-Geigy, the international pharmaceutical company, for example, has a department entitled 'end user services', which is an information centre charged with promoting 'communality' or 'being partnered with the user'. A division of IBM France has set up a loosely structured department called the Methods and Projects Department. The department has a dual purpose: at the professional level, it promotes an awareness of the functions and missions of management; at the information systems level, it ensures that staff have experience in information technology. User management is responsible for the definition, feasibility, introduction, and management of projects and applications to suit their own requirements.

Changing roles will have an impact on the skills required

Most Foundation members recognise that the changing roles of the systems department and system users will have an impact on the types of skills required. In particular, there is an increasing need for systems department staff to have 'business knowledge'. Henkel, a German chemical company, actively encourages the development of business knowledge for all employees. The company describes the process as training staff so that "they can play on the Henkel piano". British Airways has recently redefined its specification for systems recruits to include technical ability, analytical ability, leadership/supervisory ability, and business

Figure 2.4 Different types of systems responsibilities should be allocated differently



awareness. Organisations in both France and the Netherlands now recruit staff from higher-education courses, with an equal knowledge of information technology and business.

Although these are examples of an encouraging trend, most advertisements for systems staff still specify that applicants must have experience with a programming language, a particular database, or a fourth-generation language. Peter Keen, director of the Washington-based International Center for Information Technology, believes that this derives from the time when a system professional's work and career development were based on tasks, rather than on roles. He describes a 'task' as what people do, and a 'role' as how they operate. Task-orientation has led systems departments to concentrate on the types of technical skills needed to perform jobs such as programming. In contrast, he explains, recognising the wider roles now evolving helps to identify the new sets of skills required.

We have identified four broad roles that are emerging for systems departments: technical services, development support, business support, and business services. The technical-services role includes defining technical architectures, defining standards and interfaces, providing group-wide networking, organising central purchasing of equipment, providing technical support to end users, and watching trends in information technology. The development-support role is concerned primarily with developing and maintaining systems for head office, making central bureau services available, developing core systems, and auditing quality and security. Business support includes end-user computing and office technology. Business services is an emerging role in some large organisations, and is concerned with integrating systems and business-unit planning. Figure 2.5 illustrates the broad types of skills that we have identified as appropriate for each of the four roles.

The skills required in the *technical-services* role depend largely on the way in which the technology is developing. Some traditional technical skills, such as computer operating, are becoming less important as mainframe operating systems become more sophisticated and minicomputers and personal computers proliferate. New technical skills are emerging, however. In all countries where there are Foundation members, there is, for example, an increasing demand for networking staff. New skills are required to manage the complex problems of integrating digital communications with computing in a multivendor environment. Not all the skills required in this role are purely technical, however. The job of technical support, for example, requires an ability to deal tactfully with a wide range of system users, and a service orientation, based on an awareness of the

Figure 2.5 Each of the roles of the systems department requires a different emphasis on particular skills and knowledge

	Role of the systems department			
Skill/knowledge	Technical services	Development support	Business support	Business services
Technical skills	✓✓✓	✓✓	✓	
Project-management skills		✓✓✓	✓	
Organisational knowledge			✓✓	✓✓✓
Marketing/selling skills		✓	✓✓	✓✓✓
Change-management skills		✓✓	✓✓✓	✓✓✓
Interpersonal skills	✓	✓✓	✓✓✓	✓✓✓
People-management skills	✓	✓✓	✓✓✓	✓✓✓
Business knowledge	✓✓	✓✓	✓✓✓	✓✓✓

critical nature of providing a first-class service, particularly in businesses (such as banking) that now depend on the availability of networks.

In the *development-support* role, there will be a continuing need for technicians who develop and support core applications. In addition, maintenance of older systems increasingly requires highly skilled technicians who can keep them running in an online environment, and with a volume of transactions for which they were not originally designed. New types of technical skills are also becoming critical — data analysis, data-dictionary management, and the use of software-development aids, for example. Thus, technical skills will continue to be required in the development-support role, but new types of skill are required as well. Maintenance, for example, requires an understanding of business priorities, an ability to communicate with users, and a service-orientation. In addition, project-management skills will be increasingly critical in ensuring that the development-support service is provided in a timely and efficient way.

In the *business-support* role, non-technical skills are becoming as important as technical skills, and a new 'hybrid' type of person is required who is equally competent in both technical skills and business knowledge. This role requires an understanding of the context of the system (including work, workers, ergonomics, and organisational procedures), an ability to communicate and listen well, acting as educator and consultant, and a broad-based business and functional knowledge. Business-support staff are likely to be competing increasingly with external suppliers of software and consultancy services, who will be marketing their services directly to system users. This type of staff will therefore also need to develop skills in marketing their services. (We dealt with the subject of marketing in Report 66, *Marketing the Systems Department*, published in October 1988.)

The *business-services* role requires a very low level of technical skill. The prime requirements are for a solid grounding in business planning, and for a detailed knowledge of the functional areas. Staff carrying out this role will need to work closely with business-unit managers at a fairly senior level, and interpersonal skills are therefore an important prerequisite.

It is clear that the skills required in the future in the systems department will be very different from those that were adequate in the past. The implication is that systems managers must change their pattern of recruiting. Staff being recruited for the systems department have traditionally been assessed to check that they have the required level of technical skill. It is now much more important to test that recruits have the appropriate personality characteristics to operate in an environment where they will have to market their skills and services to the business and to work in a closer partnership with the business, than has previously been the case. In this context, it will also be critical to forecast how many staff of each type will be required, so that action can be taken to ensure that they are in place to provide support to the business at the right time. This is best achieved by taking a long-term approach to planning future staff numbers (or, to use the modern jargon, human-resources planning).

A long-term approach to human-resources planning is required

Many organisations now produce a long-term systems development plan (up to five years, in some cases), and as part of the process, a plan of the resources required. A critical component of the resource requirement is the people, but few organisations have linked their human-resources planning to the long-term systems (or business) plans. The reason usually given is that it is too difficult to plan for human resources in times of uncertain user demand. No organisation we spoke to during our research had developed human-resources plans further ahead than one year, and the more usual planning horizon was six months. It is clear that most systems departments have only a limited interest in human-resources planning.

There are many reasons why Foundation members should incorporate human-resources planning into the longer-term systems-planning process. The most important are:

— Planning ahead, rather than reacting to immediate needs, removes a possible constraint on development plans. With demand for systems staff continuing to exceed supply in all European countries, it can take up to six months to recruit someone.

Moreover, once a new recruit joins, he or she will not usually be fully productive for at least three months. Planning nine months ahead is therefore the absolute minimum to ensure timely recruiting.

— A plan specifying the types and numbers of staff needed to implement the systems strategy will serve as a basis for measuring progress against objectives, and for assessing the effect on staffing of any changes in that strategy.

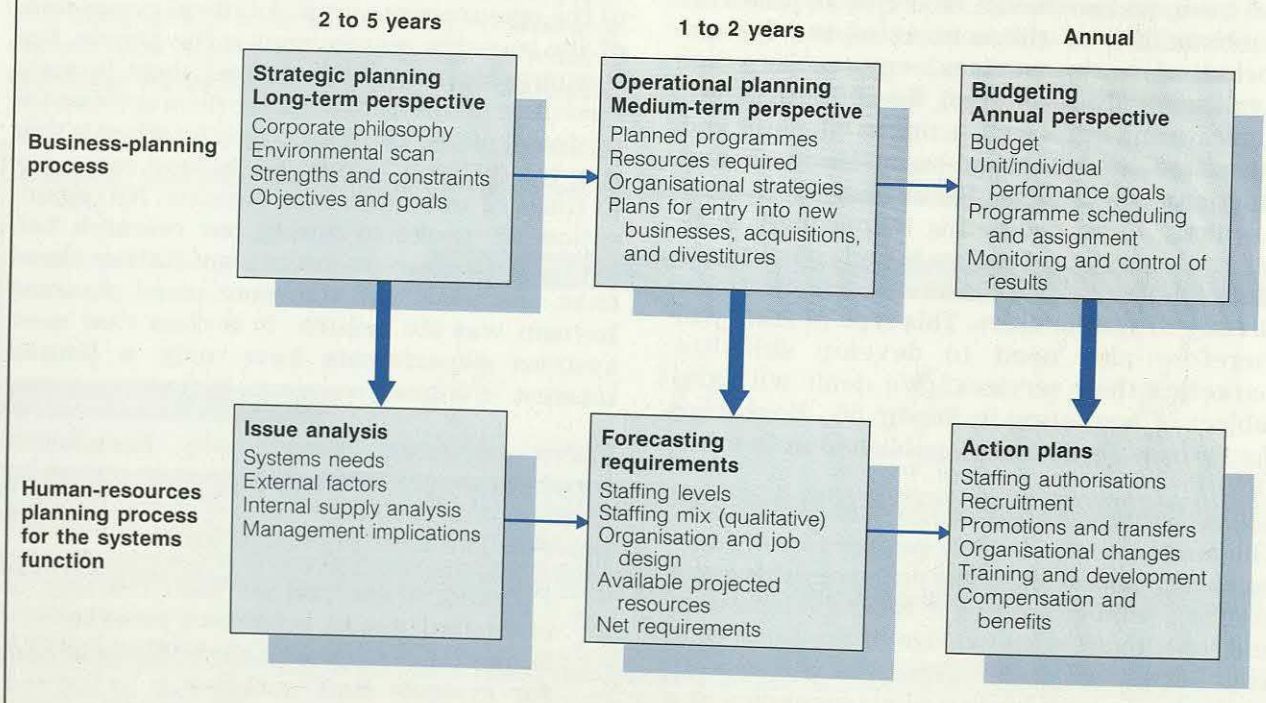
— Knowing what human resources will be required in the longer term means that it will also be possible to take a long-term view of the possible options for meeting future demand, such as training and developing existing systems staff rather than recruiting new staff, using packages (or third parties) instead of developing systems in-house, or transferring staff from user areas. All of these options may be more cost-effective than recruiting, in view of the time it takes for a new recruit to become fully productive.

To ensure that the plan is a useful indication of staff needs, it must be linked with the different levels of general business planning in the organisation. Figure 2.6 depicts the relationship between the two. Strategic business planning (two to five years or longer) raises human-resources planning issues, such as the external supply of recruits and the likely internal supply of employees over the period, and enables the feasibility of such plans to be assessed. The medium-term perspective of operational business planning (one to two years) raises the need for more detailed planning of staff supply (internal and external to the systems department) and demand (the numbers needed at some future period). Annual budgeting provides specific timetables and staff-allocation requirements, and results in specific action plans for recruitment, promotions, training, transfers, and so forth.

Successful staff planning requires three types of information to be available:

— *A personnel inventory* that provides an assessment of the knowledge, skills, abilities,

Figure 2.6 For human-resources planning to be effective, it must be linked with the different levels of general business planning in the organisation



(Source: Cascio W F. *Managing human resources.* 2nd edition. London: McGraw-Hill, 1989).

experience, and career aspirations of the present workforce. This information is usually available from appraisal records, but should be collated into a consistent format.

- *A turnover model* that predicts, from the number of staff losses in the past, the likely rate of staff turnover in the future. This requires staff leaving the systems department to be categorised as resignations, transfers to other parts of the organisation, dismissals, and (perhaps not so likely among systems staff) retirements. The model is then refined for each category by comparing actual losses with forecast losses each month for each category.

- *Staff objectives*, which vary according to the type of environment an organisation operates in, the current design of jobs, and corporate policy. Examples of the staff objectives for two very different companies are shown in the first two columns of Figure 2.7 (although neither of these relates to systems staff). The objectives are almost total opposites, but both are valid because they reflect the different industries and labour markets in which the two companies operate. The third column of Figure 2.7 contains possible staff objectives for a typical systems department in a large organisation. The objectives reflect the roles emerging in today's systems department, and the constraints of the current recruitment market. Staff objectives will have an impact on decisions about how to design and enrich jobs, and what kind of people to recruit.

In general, it is possible to produce useful forecasts of staff needs only for the 'family' of jobs within a broad role. Figure 2.8, overleaf, lists the job families that were identified by the systems department of a leading American bank for each of the four broad roles identified earlier in this chapter. The steps in the human-resources planning process, using the types of information defined above, are depicted overleaf, in Figure 2.9, for the development-support 'job family', and are described below:

- Current staff complement is determined from the personnel inventory for each grade.

- Losses are determined by the turnover model, and include resignations, dismissals, transfers, and retirements.

- Back-up is determined from appraisal information about staff who could be considered for promotion, and their career aspirations, and possible transfers from user departments.

- Future demand is forecast from the human-resources planning framework depicted in Figure 2.6, taking into account the staffing objectives set for the department.

Figure 2.7 Different types of organisation need different staff objectives

	McDonald's	Philips	Examples for systems staff
Definition of jobs	Define jobs narrowly, so that they are easy to learn in a short period.	Define jobs to provide a challenge to the increasingly educated workforce expected in 20 years' time.	Broaden the scope of jobs to provide increased flexibility for individuals, particularly in their ability to move around within the organisation.
Pay	Pay minimum wages to most non-management employees, so that the cost of staff turnover is kept low.	Pay competitive salaries.	Pay supplements to market rates to attract good staff.
Design of jobs	Design jobs to minimise decision-making by humans. Thus, McDonald's cooking operations are computer-controlled and items are labelled on cash registers.	Design jobs to minimise turnover, because staff are hard to replace.	Design jobs to maximise decision-making by humans and increase motivation.

(Source: Cascio, W F. *Managing human resources.* 2nd edition. London: McGraw-Hill, 1989, and Butler Cox.)

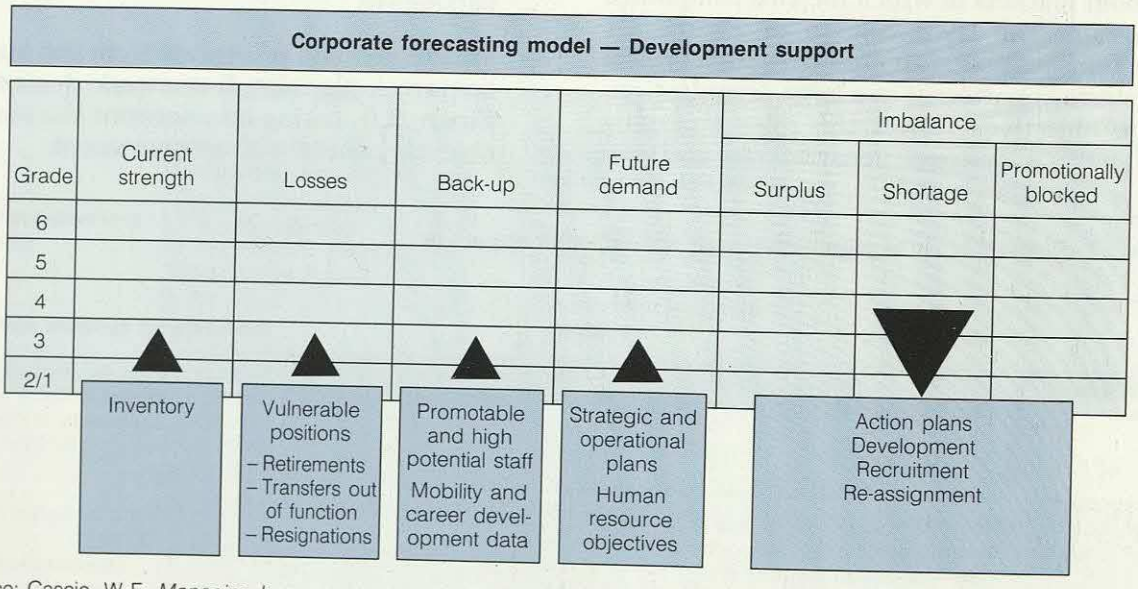
Figure 2.8 Each of the broad systems roles comprises a family of jobs

A leading American bank identified the following job families for each of the four broad roles.

Technical services	Development support	Business support	Business services
Architecture and integration planning	Megaproject coordination	Systems account management	Business measurement and performance analysis
Computing utility specialist services	Project leadership	Customer marketing and service support	Capacity anticipation
Computing utility operations services	Development support	Education and training support	Business-unit planning support
Specialist technical support	Systems asset management	Computer-related risk assessment	Economic planning: funding, costing, and pricing analysis
Technology scanning and evaluation	Quality assurance	Business systems standards and policies support	High pay-off opportunity analysis
		Information library coordination	Corporate information architecture
			Vendor relationship management
			Human-asset planning
			Work-environment planning

(Source: Keen P G W. *Roles and skills for the IS organisation of tomorrow: an ICIT briefing paper.* London: International Center for Information Technologies, 1987.)

Figure 2.9 The human-resources planning process consists of five steps



(Source: Cascio, W F. *Managing human resources.* 2nd edition. London: McGraw-Hill, 1989.)

— Imbalance (or the requirement for additional staff) is calculated as the difference between the forecast supply (current strength, minus losses, plus back-up) and the forecast demand.

— Alternative plans to meet the requirements are considered and the results acted upon.

Although there is bound to be a degree of error in any attempt to forecast demand for and supply

of human resources, the process described above should minimise the uncertainty. Successful human-resources planning for systems staff depends on greater integration with the strategic business-planning cycle, an informed dialogue with line managers on the implications of system plans for systems staffing levels (taking into account all the factors that affect supply), and a timely consideration of alternative actions.

One of the outcomes of the human-resources plan will be the profile of the staff who need to be recruited. We discuss a new approach to recruiting systems staff in Chapter 3.

Chapter 3

Recruiting staff

Almost without exception, Foundation members reported difficulties in recruiting systems staff. In some cases, notably in the public sector, this was attributed to the inability of the organisation to pay competitive salaries. The most frequently quoted reasons in other organisations were associated with the skills shortage and the difficulty of getting potential applicants to respond to advertisements.

In some countries, there is evidence of a demographic change that will result in a lower number of school leavers and university graduates over the next five years. There is also evidence that a smaller proportion of these potential recruits is being attracted into careers in systems, because career opportunities are not well defined, roles and responsibilities are unclear, and the status hitherto associated with systems roles is now in question.

Undoubtedly, some organisations will always find it easier to recruit than others. Candidates will be attracted to certain industry sectors, and to certain geographical locations. In general, however, recruitment will become more difficult.

Systems managers have traditionally had a restricted view of the sources of potential recruits. Now, there is an opportunity to expand these sources. To do this successfully, organisations will need to adopt a marketing approach to recruitment, and to modify their selection procedures, giving greater prominence to the evaluation of non-technical skills.

Expand the sources of potential recruits

Systems managers need to re-assess the sources of potential recruits, both in response to the changing roles of systems staff, and to the increasing difficulty of recruiting from traditional sources. Not only will they have to look at new external sources, but they will have to seek to transfer staff from other functions within the organisation to the systems function.

The traditional sources have been limited

In Chapter 2, we reviewed the four stages in the evolution of the systems function between the 1960s and the 1990s. We explained that the gradual separation of technical-computing issues and application issues will increase the demand for staff with non-technical skills. Increasingly, business analysts will be sought to help users to select and implement packaged systems, fourth-generation languages, and expert systems. Systems managers should therefore begin now to question whether the two main sources from which they have traditionally drawn recruits — technical graduates, and staff with specific skills — are sufficient.

Technical graduates

One Foundation member told us that he insists on recruiting technical graduates because he considers it the best measure of potential ability, and in any case "it has been a successful method of recruitment in the past". He admitted, however, that recruiting technical graduates was becoming more difficult. In fact, in most countries in which the Foundation is represented, the number of graduates is likely to fall dramatically in the 1990s owing to demographic trends. The Organisation for Economic Cooperation and Development (OECD) forecasts a decline in the number of 15- to 19-year-olds in all European countries, except Ireland. West Germany will face the sharpest fall — 45 per cent between 1984 and 1995; the United Kingdom will experience a fall of 27 per cent.

There are, in fact, only two instances in which systems managers should insist on graduate

status — where proven academic ability or detailed theoretical understanding of a certain discipline is needed for the job. Neither is essential for most systems jobs. Graduates tend to be recruited not for what they know, but for what they, as individuals, could be. This potential is not unique to graduates. Furthermore, an academic qualification rarely gives any indication of the individual's personality, or guarantees that the individual is able to apply his or her knowledge.

Staff with specific skills

For most Foundation members, the intake of graduates represents the 'planned' part of their recruitment programme, and it is often complemented by training programmes to provide the recruits with specific technical skills. Other recruitment is usually in response to staff turnover, and results in a specification of all the skills and attributes required to fill the resulting vacancy. One Foundation member described this approach as "shopping for the oven-ready recruit".

The reasons for recruiting staff with specific skills have more to do with the need to re-establish the staff complement and to minimise the disruption of project deadlines than with longer-term staffing concerns. This narrow focus limits the range of work that is given to these recruits, and hence, their career-development opportunities. Yet job interest, career path, and security are the most significant factors behind job moves, according to a recent survey conducted by the UK publication, Computer Weekly. The results of the survey, in which Computer Weekly canvassed the views of 12,000 of its readers, are shown in Figure 3.1. Where staff are recruited for their specific skills, job interest and career advancement are likely to be the last ambitions to be achieved.

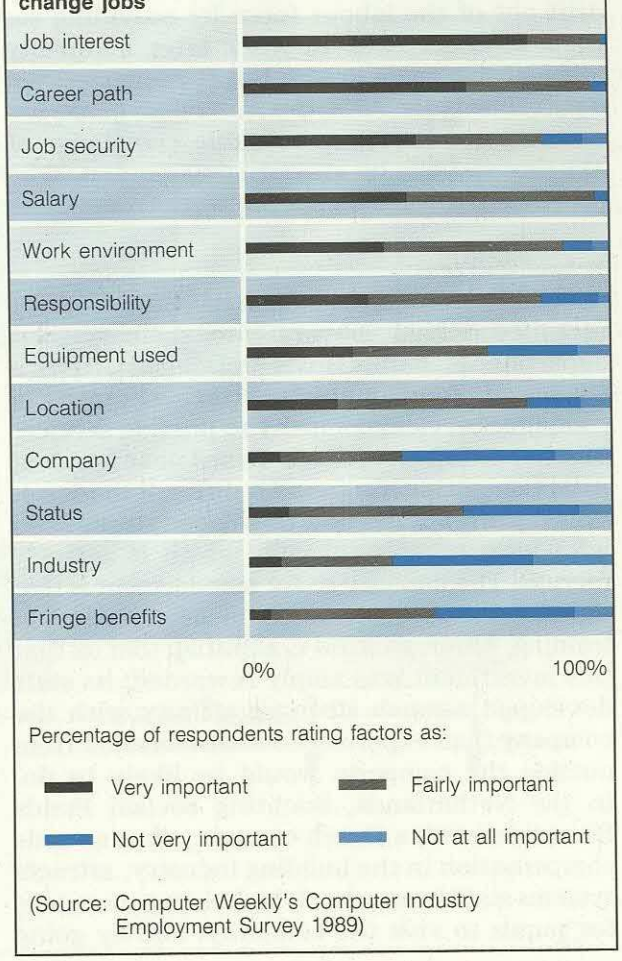
There are untapped sources of new recruits

There is evidence that systems managers are beginning to seek new sources of recruits. Foundation members are taking a wider view of possible sources, and skill requirements are being relaxed. There are, however, still plenty of untapped opportunities. During our research, we have identified the following possibilities: non-technical graduates, women, school leavers, older people, part-time staff, and internal transfers from other functions.

Non-technical graduates

Several Foundation members told us that they had been successful in recruiting non-technical graduates and developing their careers in the systems function. Increasingly relevant are business-oriented degree courses with a high systems content. In Germany, for example, Betriebswirtschaft, the study of organisation and management, is seen by employers to be a particularly relevant course of study, which they supplement by providing training in technical skills. Recently, some German universities have provided degrees that combine Betriebswirtschaft and Informatics (the study of information systems), making this University Diploma even more relevant. In Sweden, too,

Figure 3.1 Job interest and career paths are rated the most important considerations by systems staff in changing jobs



(Source: Computer Weekly's Computer Industry Employment Survey 1989)

all universities provide some form of data processing education, as an integral part of non-technical courses such as business administration, and these graduates have been successfully recruited into the systems department.

Women

We found no overt bias towards employing men or women in systems roles during our research. However, there clearly are national differences in the proportion of women within systems departments, and this seems to be largely a result of cultural differences. The United States, France, and Japan all encourage women into systems, with the result that they now represent about 50 per cent of the programming workforce on average, compared with, for instance, only 18 per cent in the United Kingdom. The recruitment and retention of women can be improved by offering flexible terms of employment, career breaks, part-time working, and homeworking. Whitbread, a UK brewing company, for example, has taken steps to ensure that it retains staff who might otherwise drift out of the labour force by providing for them to come back to work after maternity leave at the same grade, but if requested, on a part-time basis. ANZ, the Australian bank, has ensured that it retains valuable knowledge of existing systems by encouraging women, who previously worked on site, to work from home.

School leavers

Several Foundation members have successfully recruited school leavers into their systems departments. Ranks Hovis McDougall (RHM), a UK-based food manufacturer, operates a computer-services company to provide services to other group companies. Based near London, RHM Computing has found it difficult to recruit skilled staff, but has now developed strong links with local schools through which it actively recruits. The implication for management is that significant resources need to be invested in training, although RHM Computing told us that this investment was amply rewarded; its staff developed a much stronger affinity with the company than experienced staff recruited from outside the company would be likely to do. In the Netherlands, Stichting Sociaal Fonds Bouwijverheid, a Dutch company that awards compensation in the building industry, attracts systems staff from schools by holding open days for pupils to visit the company, and by going to schools to market the company and the job opportunities available in the systems department.

Older people

Older recruits warrant serious consideration in any recruitment campaign; wherever possible, age limits should be removed. There is still a widespread bias noticeable in many job advertisements against applicants over the age of 35. Employers who have removed such barriers, however, report that older employees are more reliable, and because they have fewer personal commitments, are more flexible. Nevertheless, some practical problems do exist, as we found in the Netherlands. Fokker, the aircraft manufacturer, told us that it sets an age limit of 35 because of the cost of transferring pension rights.

Part-time staff

Professor Charles Handy, in his recent book, *The Age of Unreason*, has argued that, during the next few years, the nature of work and the employment patterns associated with work are both set to undergo considerable change. He argues that, for the majority of employees, part-time work will become the norm as organisations seek greater flexibility through the use of knowledge-based technology. The trend to part-time work is already well established in some industry sectors, and we can see no reason why systems managers should not consider the option of recruiting part-time staff. The FI Group plc, a UK-based information systems company, has been pursuing this policy successfully for many years. The Group has a workforce of over 1,000 computer professionals, a large proportion of whom work flexibly on a part-time or full-time basis from one of the Group's geographically widespread work centres.

Internal transfers

Systems management should encourage a two-way flow of staff into and out of the systems department. Such moves can only enhance the success of the systems department in the future. In the short term, movement into the department will help the systems department to evolve to the 'infrastructure stage', which we described in Chapter 2, and which is concerned with working in partnership with the user community. In the longer term, systems staff will provide an ideal resource for positions in functional areas of the business, as a result of

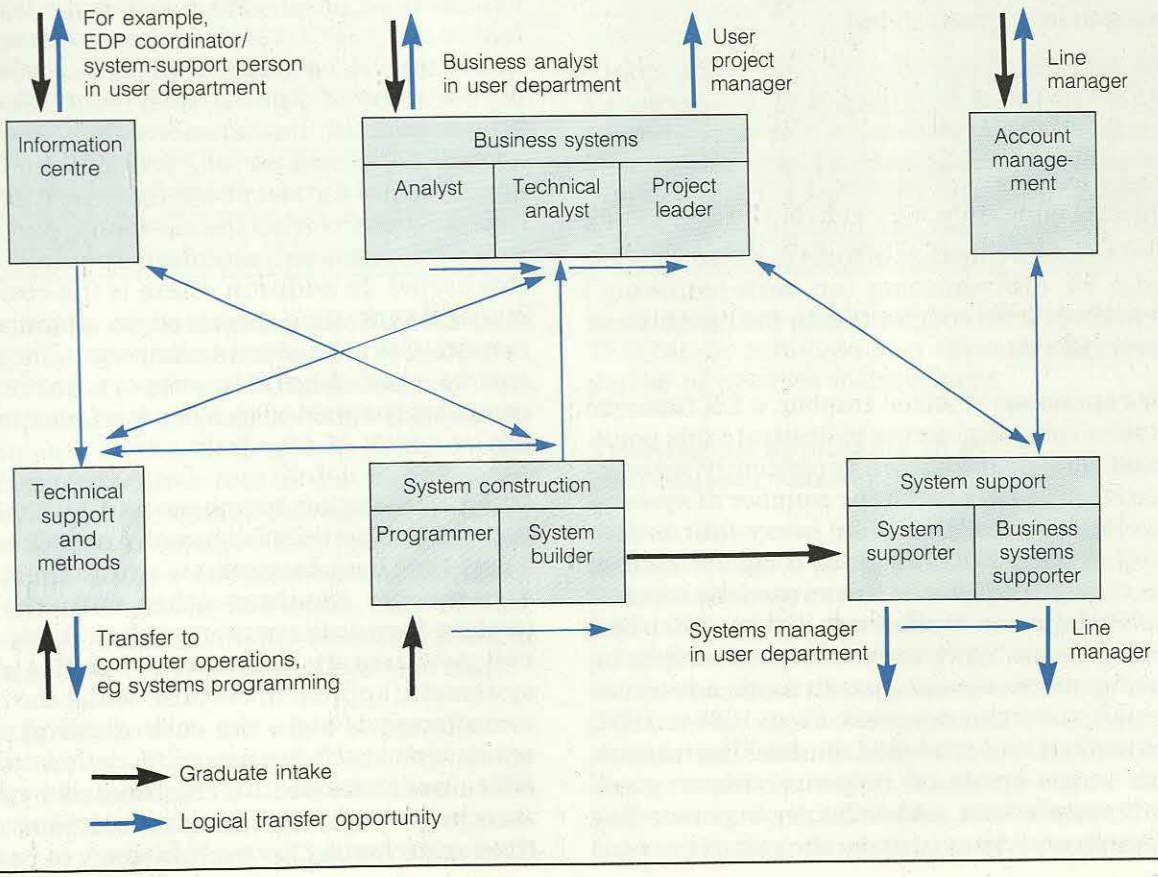
their knowledge of the critical organisational assets of systems and information. In the past, the higher salaries paid to systems staff have deterred movement out of the systems department. However, a recent survey conducted by Price Waterhouse shows that the rate of increase in systems salaries within the systems department is now broadly in line with salary increases throughout the organisation in all countries except Australia. Such movements are therefore likely to become more commonplace. A case in point is SAAB in Sweden. Figure 3.2 illustrates SAAB's process of career development by transfers to and from business areas.

Each of the possibilities discussed for extending the sources of potential recruits is being exploited now. Some systems managers may find it difficult and threatening to accept that candidates from a non-conventional source might be effective. These sources, however, often produce employees who are more flexible and more prepared to adapt to the values and culture of their environment than fully trained systems staff attracted from other companies, who may feel that there is little more that they can learn. Systems managers will, however, need to be imaginative in the way they approach these new sources of recruits, and skilful in ensuring that once recruited, the resource is fully used.

Adopt a marketing approach to recruitment

There is still a tendency for systems managers to believe that after drafting an advertisement and placing it in the computer press, they can

Figure 3.2 Career development in the systems development department at SAAB's car division is based on transfers to and from business areas



sit back, wait for the responses from 100 or more people, and choose the best candidate at leisure. This view will inevitably result in continuing recruitment difficulties for the systems department. To avoid these difficulties, Foundation members should adopt a marketing approach to recruitment. (In Report 66, *Marketing the Systems Department*, we defined marketing as: "The deliberate management of the whole relationship between a supplier of goods and services and its customers".) We have identified three crucial aspects of such an approach:

- Differentiating and marketing the systems department and the jobs on offer.
- Devoting adequate resources and management effort to the recruitment process.
- Treating all applicants in a professional manner.

The key to the success of any marketing approach is knowing the market. In recruitment terms, this means knowing the sources of potential recruits, and the features that are likely to attract them to a particular organisation and a particular vacancy.

Differentiating and marketing the systems department

The success of recruitment campaigns can be either enhanced or hindered by the corporate 'image' of the organisation. Computer-service companies generally have a higher profile with potential recruits than user organisations, although even they are acutely aware of the need to make constant efforts to enhance their image by distinguishing (or 'differentiating') themselves from competitors in the recruitment marketplace.

The experience of Allied Dunbar, a UK financial services company, serves to illustrate this point. Allied Dunbar has grown consistently since its formation in 1971, with the number of systems development staff doubling every four to five years. During 1988, its plans for growth were even more ambitious — to increase the number of development staff from 220 to 300. This target was unlikely to be achieved simply by placing conventional recruitment advertisements in the computer press. From 1985 to 1987, this method had produced diminishing returns, with lower levels of response, fewer good-quality applicants, and difficulty in persuading selected candidates to make the commitment to join. Allied Dunbar therefore carefully structured a recruitment campaign, seeking candidates through various media, and using the theme of 'involvement' as the way of differentiating its systems department and the job vacancies. The approach adopted is described in Figure 3.3. While Allied Dunbar was concerned with recruiting experienced systems development staff, this approach could easily be applied to the recruitment of all systems staff.

Other methods of differentiating and marketing the systems department include being active in user groups, publicising interesting or innovative systems developments in the trade press, developing contacts with potential recruits by involvement with schools, universities, and so on, and encouraging the word-of-mouth approach. It is virtually impossible to do too much promotion.

Devoting resources and management effort to recruitment

Recruiting is costly, both in terms of time and money. Typically, the total cost of recruiting an experienced programmer in Europe is equivalent to one year's salary, broken down as shown in Figure 3.4 on page 22. This is made up of 30 per cent of annual salary for relocation, 20 per cent of annual salary for advertising, agency fees, and so on, and 50 per cent of annual salary for loss of effectiveness during the first six months with the company, and for the extra management attention required during this period. In addition, there is the cost of the management time involved in planning and running the recruitment campaign. The money can be used wisely to support an effective campaign, or wasted as a result of poor marketing or a lack of resources.

Many Foundation members told us that their recruitment activity is normally coordinated on a part-time basis by someone within the systems department. Anything other than the most straight-forward recruitments (involving one or two new recruits), however, justifies a more systematic approach, because while the cost of recruitment is high, the cost of mistakes that result in staff turnover is even higher. Recruitment should be coordinated by a full-time project manager with recruitment objectives and a budget for each vacancy to be filled.

Figure 3.3 Differentiating the systems department and the vacancy can make it easier to attract and recruit staff

Allied Dunbar provides financial services covering life assurance, pensions, permanent health insurance, unit trusts, and home loans. It is a subsidiary of BAT Industries, based in Swindon in the United Kingdom. As at mid-1989, it employs some 3,000 people, of whom some 300 are systems development staff. Funds under management are in excess of £7.0 billion ($11.2 billion).

Computer systems are central to the smooth operation of the company, and in some areas, are used aggressively to give a competitive advantage. Systems staff enjoy a high profile in the company and are used in very broad roles on product design and new business ventures.

In the autumn of 1987, the company reviewed its manpower plan and identified the need to recruit more than 80 systems development staff to fill vacancies brought about by company growth, predicted internal transfers, and staff turnover. Advertisements in computer journals were providing diminishing returns and a two-month campaign was devised, consisting of interrelated activities aimed at promoting Allied Dunbar's image in general, and the vacancies in the systems function in particular.

Existing staff were asked why they liked working for Allied Dunbar, and their replies suggested a theme, which would serve to differentiate the systems and programming departments, and these particular vacancies, in the marketplace. Existing staff liked:

- Working on systems of central importance to the company's future.
- Working for a company with which they could identify and where many knew the directors personally.
- Knowing what the company's business objectives were and how these related to the objectives of their work.
- Being 'stretched' in achieving difficult goals and knowing that that achievement was of real benefit to the business.

From this, the theme for the recruitment campaign was chosen — involvement. The campaign emphasised the strengths of the systems development department, which made it easier to differentiate Allied Dunbar in the marketplace. Several interrelated activities were initiated, each aimed at a range of jobs:

- Advertisements in the computer press.
- Advertisements in the national press for the more senior jobs.
- Advertisements in selected regional papers.
- Attendance at recruitment fairs.
- Open days supported by local press and radio coverage.
- Posters on railway stations to catch the eyes of commuters.

Allied Dunbar prepared special literature to support the involvement theme. Anyone who showed an interest in the company received a small booklet designed to attract the attention and interest of potential candidates, both in the company and in the jobs on offer. This was followed up, for those invited for interview, with a more detailed booklet containing facts about the company, the jobs, the prospects, the location, and social activities. All of this was designed to save time at the interview stage and to help applicants to begin to relate to Allied Dunbar.

Throughout, the emphasis was on selling the company and the vacancy — but taking care not to create expectations that could not be met; this would simply have resulted in higher levels of staff turnover. Allied Dunbar filled its 80 vacancies during a period when other organisations were having trouble simply getting potential applicants to respond to advertisements.

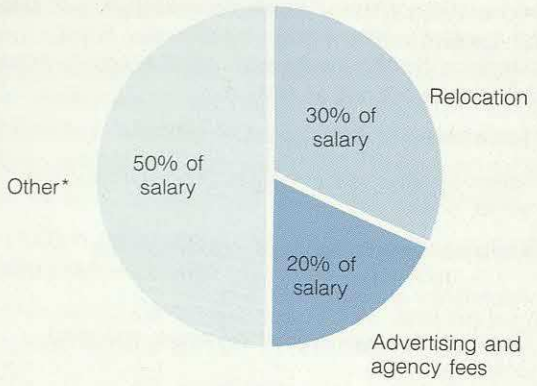
Many systems departments make effective use of personnel specialists during the recruitment process. In fact, several Foundation members employ personnel specialists within the systems department. In the Netherlands, Fokker, the aircraft manufacturer, told us that its policy was to provide a personnel manager for every section of the company with more than 300 staff. Boots, a major UK pharmaceutical manufacturer and retail-chemist chain, believes that dedicated personnel skills are essential, both for recruiting and for developing systems staff.

While working with personnel specialists is beneficial, it is inappropriate to delegate the recruitment process entirely to them. The marketing approach requires the recruitment process to provide potential recruits with something they can identify with and relate to. This can be achieved only through the participation of systems management.

Treating all applicants in a professional manner

Steven Bevan of the Institute of Manpower Studies in the United Kingdom described the professional approach this way: "We already know that the factor most likely to influence a candidate's impression of the organisation is the performance of the interviewer. Thus, if the interviewer appears likeable, light-hearted yet reassuring, enthusiastic without over-selling, honest and informed, a candidate will be more disposed to accept an offer if it is made." We have identified three aspects of a professional

Figure 3.4 The cost of recruiting is equivalent to one year's salary and consists of three main elements



* Includes an allowance for a new recruit's lack of effectiveness during the first six months with the company, and for extra demands on management during this period.

approach that are particularly important. These are to adopt efficient selection procedures, to be open and informative, and to provide quick feedback. Little effort or cost is involved in these initiatives, but they are likely to enhance the view that the candidate has of the organisation.

Adopt efficient selection procedures

First impressions are very important for potential recruits, and their experience of the recruitment process is normally their first contact with an organisation. Having generated interest in the job, managers must process applications and respond to them quickly and efficiently. Candidates selected for interviews should be given top priority. An efficient selection process should require only a single visit by the candidate, for all but the most senior vacancies.

Be open and informative

As well as allowing the candidate to ask questions, the interviewer should provide information voluntarily, to ensure that the candidate is well informed about all aspects of the company and the job. The interviewer might also provide details about local housing, schools, and so on. Some candidates will want to see the working conditions and to meet their peers; a tour of the premises, followed by lunch with one or two prospective colleagues, will give them an opportunity to resolve any queries they may have.

Provide quick feedback

Immediate job offers on the day of the interview, or very soon after, are a good means of motivating potential recruits, and provide an opportunity to ensure that all aspects of the job offer are fully understood. Applicants who are not selected should also feel that they have been treated fairly, and should have a positive impression of the company. They may very well be a candidate in the future, or they may discuss their experience with others who could be.

Improve the selection process

Increasing the sources of potential recruits and adopting a marketing approach to recruitment will alleviate some of the recruitment difficulties being experienced by systems managers, but on their own, they will not ensure that the right people are recruited. The Institute of Manpower Studies in the United Kingdom has reported that few employers select recruits on the basis of any systematic analysis of job requirements. (The checklist provided in Figure 3.5 will give Foundation members an indication of the appropriateness of their own selection procedures.) Most recruiters prefer to rely on their subjective judgements of a candidate.

There are well-tried selection techniques that remove some of the subjectivity of the interview process, such as structured interviews, aptitude tests, and general ability tests (that measure skills such as numerical and verbal reasoning). These tests are widely used by Foundation members. The shortcoming with each of these methods, however, is that they measure only the potential ability of an applicant to do a job. To get an indication of whether a person *will* do a job, two further features need to be assessed — the degree of fit between the motivating potential of a job and the aspirations of the candidate, and the personality characteristics of the applicant as a measure of his or her suitability for the job.

Match a job's motivating potential with the aspirations of the candidate

Increased staff turnover is, very often, a direct result of over-selling the vacancies. Employers, anxious to fill positions at a time when candidates are in short supply, are likely to overemphasise the positive aspects of a job to a

candidate. If more attention is paid to putting the right 'type' of person into a job, much of this costly turnover can be avoided. One way of achieving this is to match the job's motivating potential with the individual's need for growth.

Two American researchers, Hackman and Oldham (whose work is referenced in Zawacki's research), defined the motivating potential of a job as deriving from five measurable job dimensions: skill variety, task identity, task significance, personal responsibility, and work feedback. Skill variety is the extent to which the job calls for different skills and talents. Task identity measures the completeness or wholeness of the work involved in the job. Task significance is to do with the job's impact on other people. The fourth dimension measures the job holder's perception of personal responsibility for the work in terms of freedom, independence, and discretion in determining job procedures. The fifth dimension, work feedback, is concerned with the job holder's knowledge of the outcome or effectiveness of the work. Both the extent and the timeliness are important. Each dimension is rated on a scale of one (low) to seven (high). The ratings are then combined to give a composite motivating potential score (MPS) of between 1 and 343.

Robert Zawacki, a human-resources consultant, and Douglas Couger, a professor of computer and management science, surveyed more than 1,500 staff in the United States between 1980 and 1985, and found a large variation in the motivating potential of various systems jobs. The results of this research are shown overleaf in Figure 3.6, which also shows the results for other non-systems professionals and managers. In a separate research study, they constructed a measure of the needs of staff for accomplishment, learning, and developing, and for being well-stimulated and challenged, which they called 'growth-need strength' (GNS). The key to individual motivation and productivity is to

Figure 3.5 A checklist will indicate the appropriateness of recruitment procedures

To determine whether your recruitment and selection procedures are adequate, circle the appropriate answer to the following seven questions. Then read the relevant paragraph for an interpretation.

1. For what percentage of jobs do you hold a job description?
   A. Over 75% B. Around 50% C. Under 25%
2. How frequently are job descriptions updated?
   A. When a vacancy arises B. Annually C. Biannually
3. For what percentage of vacancies is a detailed specification of job skills, abilities, and personality traits prepared?
   A. Over 75% B. Around 50% C. Under 25%
4. When a vacancy arises, how often do you review the workload/work methods of the section involved?
   A. Always B. Sometimes C. Seldom
5. How frequently are interviews used as the sole criterion for selection in your organisation?
   A. Seldom B. Sometimes C. Always
6. How frequently are selection decisions validated by checking recruiters' assessments against later staff appraisal ratings?
   A. Always B. Sometimes C. Seldom
7. How frequently are psychological tests of ability, personality, and potential used by your organisation?
   A. Always B. Sometimes C. Never

Interpretation

Most circles around A: Your selection procedures appear *prima facie* sound, although ongoing validation is still essential.

Most circles around B: Your organisation's selection procedures appear in some respects to be sound, but a detailed review of the predictive validity would almost certainly prove beneficial.

Most circles around C: Your organisation's selection procedures appear to be in urgent need of review in the light of recent developments in recruitment and selection techniques. You would be well advised to investigate more accurate and cost-effective assessment methods.

(Source: Anderson, N and Shackleton, V. The chosen few. *Management Today*, November 1988.)

Figure 3.6 The motivating potential of a job is based on five job dimensions

	Systems development jobs					Other jobs		
Job dimension	Analysts	Analysts/programmers	Programmers	Maintenance[1]	Managers	All staff	Professionals	Managers
Skill variety [2]	5.55	5.45	5.23	4.80	6.16	5.41	5.36	5.57
Task identity [2]	5.37	5.29	5.00	4.30	5.80	5.21	5.06	4.72
Task significance [2]	5.75	5.72	5.46	5.40	6.30	5.61	5.62	5.81
Responsibility for work done	5.31	5.49	5.13	4.70	6.10	5.29	5.35	5.73
Knowledge of outcome of work (feedback)	5.20	5.05	5.10	4.30	5.25	5.13	5.08	5.15
Motivating Potential Score (MPS) [3]	154	152	137	106	199	154	154	156

Notes:

[1] Data relates to staff who spend more than 80 per cent of their time on maintenance work.

[2] The average of the rating for each of these dimensions forms the rating for the importance of the job.

[3] MPS is calculated by multiplying the average rating of the first three dimensions by the rating of the last two dimensions.

The above data comes from a US survey carried out by Couger and Zawacki in 1980, except for maintenance staff, where the data was gathered in a 1985 US survey by Couger and Colter. In both cases, survey respondents rated each of the job dimensions on a scale of 1 (low) to 7 (high).

match the job's motivating potential to the individual's GNS.

Thus, there are four possible outcomes of the selection process, as shown in Figure 3.7. In Cell 1, for example, a role with a high MPS, such as development support, is matched with a person who wants to be challenged and stretched, and the match is appropriate. In Cell 2, however, the same role is filled by someone who has less need to develop, and who may therefore feel overstretched. The point is that the systems department needs to fill jobs with high *and* low motivating potential (such as computer operating or data-entry work), and the systems manager must therefore attempt to select high-GNS people for jobs with a high motivating potential and lower-GNS people for jobs with a lower motivating potential. The procedure described below will increase the ability of the systems manager to match an appropriate person to the job.

First, the manager determines whether the job to be filled has high or low motivating potential, and draws up a personal specification to match. He or she selects a *team* of interviewers, to reduce subjective bias, and plans four or five questions to test candidates' needs to be challenged, to continue to grow, to develop, and to move beyond where they are. After the interview, the systems manager discusses with the interviewing team how well the candidates fit the level of challenge offered by the job, and chooses accordingly. It takes practice and discipline to avoid the natural tendency always to pick the most 'dynamic' candidate. The result should be a better match of person to job, leading to high work motivation, high-quality work performance, low absenteeism, and low staff turnover.

As the demands made on systems staff change, the type of person selected will also need to change. The motivating potential of systems jobs in the future will differ from the motivating potential of traditional development and operational roles. Systems managers will need to consider the implications of this carefully before redeploying existing staff or recruiting new staff.

Measure personality characteristics

In Chapter 2, we stated that the changing roles of the systems department imply that new skills

are required to fulfil these roles. Increasingly, non-technical skills will be needed, which makes it more important to ensure that recruits have the appropriate personality characteristics to operate in these roles. Our research revealed several companies using a variety of ways of measuring personality, and some clear national differences. In Germany, for instance, we were told that such measurements were taboo. Elsewhere, personality measurement was often being used either to confirm an interviewer's feelings about a candidate, or to reveal 'negative' features, which might be the basis of further discussions. Only one member we spoke to (a Dutch software house) regularly used personality measurement as a major input to the selection process. Many Foundation members consider that the cost and effort involved in carrying out such measurements outweigh the benefits. Increasingly, however, suppliers of personality-measurement questionnaires are making their products available on personal computers, which means that the results can be interpreted and marked automatically. They should become much more widely used, particularly in assessing a candidate's ability to function effectively in the non-technical areas of the systems function.

Personality can be defined as the characteristics that determine the way a person thinks and behaves. On their own, such measures are uninformative, and users of personality-measurement questionnaires therefore have three choices in putting them into practical use:

- To work with the questionnaire supplier to define the personality profile associated with particular jobs, against which the results can be judged.
- To compare personality profiles of candidates with evidence that is available from questionnaire suppliers for an increasingly wide range of occupations.
- To define the relationship between the personality profiles of existing staff and the level of performance achieved in the job. This results in the identification of 'danger zones' — that is, personality characteristics that should be avoided for particular types of job.

The retail bank of the TSB Group has publicly described its use of this method for selecting systems staff. It used the Saville and Holdsworth Ltd (SHL) Occupational Personality Questionnaire, and identified 'areas of risk' by asking 100 of its 400 analysis and programming staff to complete a series of questionnaires. The results of these were correlated with performance measures that rated the staff's effectiveness and that were assessed by managers. The analysis showed that:

- Personality factors were a better indicator of potential performance than aptitude tests.
- Certain personality characteristics correlated with good performance.
- Certain personality characteristics mitigated against good performance.

The SHL questionnaire measures 30 personality dimensions in three main areas — relationships with people, thinking style, and feelings and emotions. Each dimension is measured on a scale of 1 to 10. The dimensions are shown overleaf in Figure 3.8. TSB has established some 30 areas of risk, depending upon the job, and as a result, has changed the focus of its selection process. The usual concentration on positive features in the recruitment process means that many very adequate people are rejected. The questionnaires allow a wider range of candidates to be considered. TSB is now confidently assessing recruits by looking for those personality dimensions that inhibit good performance —

Figure 3.7 The selection process should result in a good match between meaningful work and a person's need for meaningful work

Cell 1 Task with high MPS Individual with high GNS Match: Good	**Cell 2** Task with high MPS Individual with low GNS Match: Poor
Cell 3 Task with low MPS Individual with high GNS Match: Poor	**Cell 4** Task with low MPS Individual with low GNS Match: Good

MPS = Motivating potential score of the task
GNS = Growth-need strength of the individual

(Source: Datamation, 15 September 1985.)

Figure 3.8 The Saville & Holdsworth Ltd questionnaire measures personality on 30 dimensions

	Relationships with people	
Assertive	Persuasive Controlling Independent	Enjoys selling, changes opinions of others, convincing with arguments, negotiates Takes charge, directs, manages, organises, supervises others Has strong views on things, difficult to manage, speaks up, argues, dislikes ties
Gregarious	Outgoing Affiliative Socially confident	Fun-loving, humorous, sociable, vibrant, talkative, jovial Has many friends, enjoys being in groups, likes companionship, shares things with friends Puts people at ease, knows what to say, good with words
Empathy	Modest Democratic Caring	Reserved about achievements, avoids talking about self, accepts others, avoids trappings of status Encourages others to contribute, consults, listens, and refers to others Considerate to others, helps those in need, sympathetic, tolerant
	Thinking style	
Fields of use	Practical Data rational Artistic Behavioural	Down-to-earth, likes repairing and mending things, better with the concrete Good with data, operates on facts, enjoys assessing and measuring Appreciates culture, shows artistic flair, sensitive to visual arts and music Analyses thoughts and behaviour, psychologically minded, likes to understand people
Abstract	Traditional Change-oriented Conceptual Innovative	Preserves well-proven methods, prefers the orthodox, disciplined, conventional Enjoys doing new things, seeks variety, prefers novelty to routine, accepts changes Theoretical, intellectually curious, enjoys the complex and abstract Generates ideas, shows ingenuity, thinks up solutions
Structure	Forward planning Detail conscious Conscientious	Prepares well in advance, enjoys target setting, forecasts trends, plans projects Methodical, keeps things neat and tidy, precise, accurate Sticks to deadlines, completes jobs, perseveres with routine, likes fixed schedules
	Feelings and emotions	
Anxieties	Relaxed Worrying	Calm, relaxed, cool under pressure, free from anxiety, can switch off Worries when things go wrong, keyed up before important events, anxious to do well
Controls	Tough minded Emotional control Optimistic Critical	Difficult to hurt or upset, can brush off insults, unaffected by unfair remarks Restrained in showing emotions, keeps feelings back, avoids outbursts Cheerful, happy, keeps spirits up despite setbacks Good at probing the facts, sees the disadvantages, challenges assumptions
Energies	Active Competitive Achieving Decisive	Has energy, moves quickly, enjoys physical exercise, doesn't sit still Plays to win, determined to beat others, poor loser Ambitious, sets sights high, career-centred, results-oriented Quick at conclusions, weighs things up rapidly, may be hasty, takes risks

the areas of risk. The questionnaires bring to the fore negative factors which, in the traditional interview process, may not have been detected, or which would have attracted less attention than positive factors. TSB attributes its markedly reduced staff turnover partly to the use of personality questionnaires. The questionnaires are not a substitute for other selection methods, however, but are seen as complementary to them.

In this chapter, we have been concerned with the process of recruiting staff for the systems department — where to find them, how to attract them, and how to select them. We have suggested that retaining staff begins with ensuring that the right people are in the right jobs, but by itself, this is not sufficient. In the next chapter, we consider how systems managers can motivate, develop, and reward staff to help them to become more productive and to encourage them to stay.

Chapter 4

Developing, motivating, and rewarding staff

In our survey, motivation and staff productivity were rated by Foundation members as their least important current concerns. At the same time, however, members frequently complain that, despite their best efforts, their best people are continually being enticed to other firms by offers of higher salaries. Although few employees leave a job for a lower salary, money is not always the main reason for leaving. The decision to leave a company arises from a combination of factors, such as a lack of responsibility, a lack of opportunity to develop a career, an inability to communicate with management, a lack of recognition, and so on. Ensuring that staff are highly motivated will go a long way towards solving staff turnover problems, and easing the recruitment difficulties that most systems managers are experiencing.

On a recent lecture tour of Europe, Robert Zawacki, whose research work was discussed in Chapter 3, mentioned a cartoon he had seen. It depicted a programmer brandishing a gun at his manager. The programmer says: "This is not a hold-up — I just want to talk to somebody". That cartoon summarises, in essence, what this chapter is about — how to make employees feel so good that they want to stay with the organisation. Our research has shown that effort spent on developing, motivating, and rewarding staff properly is more than compensated for by increased productivity and reduced turnover.

In this chapter, we concentrate on the four actions that we found to be particularly important in reducing staff turnover. The first is to provide opportunities for career development and to ensure that staff follow paths that maximise their potential. The second is to educate staff for the broader roles demanded of them today. The third is to implement a personal goal-setting and feedback procedure for all staff in the systems department, to increase motivation. The fourth is to reward achievement with performance-related pay.

Provide opportunities for career development

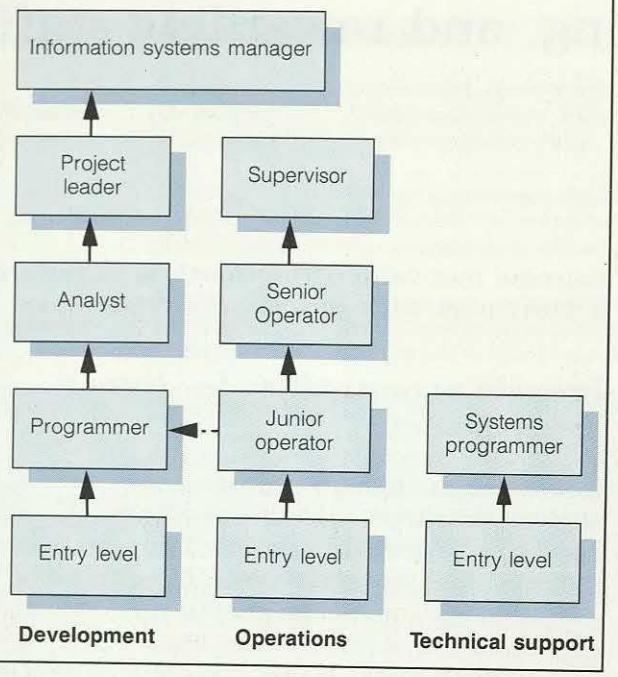
Our research among Foundation members has shown that career planning in systems departments is frequently restricted to succession planning for managerial posts, if it exists at all. Yet, for staff with a high growth-need strength (described in Chapter 3), challenging and interesting work is the biggest potential motivator, and this means providing suitable opportunities for career advancement. A recent study of staff-turnover rates carried out by Butler Cox's representative in Australia concluded that commitment to developing the career of an individual is a critical factor in reducing turnover.

Career paths are currently restricted

One of the main reasons for the lack of career-development opportunities for systems staff is that the career structure has not always been modified in line with the changing roles of the systems department, which we described in Chapter 2. Instead, attempts are made to 'bend' the jobs required by the new roles to fit the traditional vertical career path that is still common in systems departments (see Figure 4.1, overleaf). In this structure, promotion opportunities are based on technical performance and are mainly centred around applications development work.

One company we spoke to during our research attempted to solve this problem by insisting that possession of good people-management skills was a prerequisite for promotion. As a consequence, it created a group of senior systems managers who did not have sufficient technical

Figure 4.1 The traditional vertical career path is still common



knowledge to do their jobs, because it had overlooked the technical-development aspects. Another approach was to create a myriad of new job titles to create the illusion of career progression. This also fails to address the real issue, which is to provide a structured framework of suitable career opportunities for everyone, recognising the potential value of both technical and non-technical skills, and rewarding both equally.

Promotion criteria favour technicians

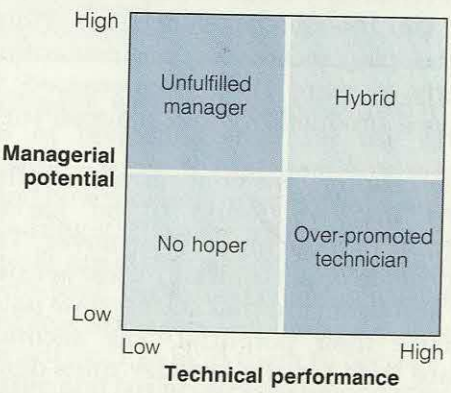
The disadvantage of the typical promotion path based on technical performance is that it leads to frustrated staff, to wasted career opportunities, and eventually, to increased staff turnover. At the extreme, it can produce the situation illustrated in Figure 4.2. Each quadrant shows the likely career prospects for an individual, based on current technical performance and managerial potential:

- The *no-hoper* has low managerial potential and average technical performance. This person makes only a limited contribution to the business and is unlikely to stay long.
- The *hybrid* has high managerial potential and superior technical performance. This type of person is easy to identify and is likely to advance through any career path, but is comparatively rare.
- The *unfulfilled manager* has high management potential and average technical performance. Because career progression is usually based on technical performance, this person is not given the opportunity to take responsibility for leading a team, and is likely to look for a more satisfying career elsewhere.
- The *over-promoted technician* is probably typical of many systems professionals today. These types of people have very little managerial potential, but technically, they perform very well. They have been promoted to their present positions as a reward for good technical performance, and are likely to continue this pattern of advancement when they become managers themselves.

The result of this promotion pattern is a totally unsatisfactory career-development path for most systems staff. Programmers are moved into analyst/programmer and user-support roles regardless of whether or not they have the ability to deal with system users. Business skills and interpersonal skills are subordinated to

Figure 4.2 Staff promoted to management roles in a vertical career structure are often unsuited to the task

Staff with average technical performance are unlikely to be given the opportunity to show their full managerial potential, while staff who are good technicians are likely to be promoted to positions for which they have insufficient managerial ability.



(Source: Recruiting and retaining information technology personnel. INTRO UK Ltd, 1989.)

technical skills. Project leaders and line managers, promoted on the basis of technical skills, make poor listeners and counsellors, and usually fail to delegate technical tasks. In this environment, few people are able to see a long-term future or are motivated to develop the new skills that are vital to the success of the systems function. Three particularly important ways to remedy these career-development deficiencies should be implemented by systems directors — develop more lateral career flexibility, encourage movement to and from business areas, and recognise management as a separate path.

Lateral, as well as vertical, career moves should be possible

The first step towards providing a more rewarding career structure is to recognise the wider roles that are emerging for the systems department. We described the four major roles in Chapter 2, and explained that only one of them required mainly technical skills. The rest, we said, required 'hybrid' technical and business skills or no technical skills at all. The implication for career planning is that new career opportunities must be opened up to provide equal opportunities for technical and non-technical staff.

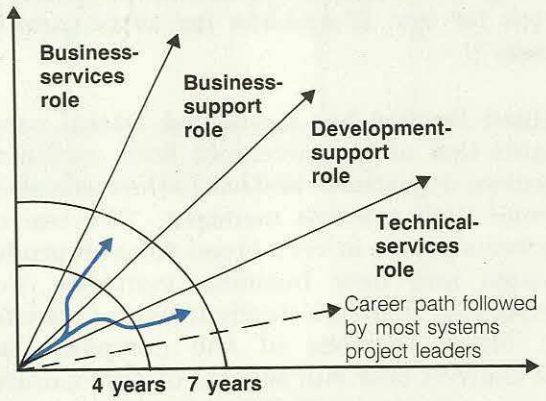
Peter Keen, whose work we referred to in Chapter 2, suggests that the traditional 'vertical' approach to career development implies that staff will follow a career trajectory that is confined to one of the four major roles, and in particular, the technical-services role. Instead of this, he proposes a more flexible approach to career development, which is depicted in Figure 4.3. There are, he suggests, two time-boundaries in a career — one at about four years, and one at about seven years. During the initial four years, staff are given the opportunity to explore the different roles, with very little career risk. During the second period, they learn their chosen craft and focus their career direction. After about seven years, it becomes increasingly difficult to move across the role boundaries.

One Foundation member in the insurance business has recently introduced more lateral flexibility in its career planning for systems staff. This company has grouped jobs into 'families', some technical and some hybrid. Each family has its own career path, with similar opportunities to advance to a senior level. Promotion within and between job families is based on skills and experience that are defined and published. The staff know exactly what opportunities exist and what is required of them for promotion, and they have the flexibility to remain within one family or to move to another.

Movement to and from business areas should be encouraged

Probably one of the biggest perceived shortcomings of a career in the systems department is the infrequency with which systems staff move into a 'mainstream' business department from their specialist technical niche. The evidence suggests, in fact, that systems departments are net importers of skills from line-management positions. Although the systems department gains valuable business knowledge and management expertise from this inflow, the situation should be balanced. If it is not, there is a danger that systems staff will be demotivated by their perceived lack of opportunity for promotion outside their department.

Figure 4.3 During their early years, staff should be able to explore the different roles before deciding on their ultimate career 'trajectory'



0 to 4 years: The individual has plenty of room to explore career trajectories

4 to 7 years: The individual needs to build on basic skills and grow into a role category

After 7 years: It is extremely difficult to move across role boundaries

(Source: Keen, P G W. *Roles and skills for the IS organization of tomorrow: an ICIT briefing paper.* London: International Center for Information Technologies, 1987.)

In some countries — the Netherlands, and Australia, for example — differences in the salaries of middle managers in the systems department and in the rest of the organisation create a barrier to moving systems staff into the business. In most cases, however, temporary secondments and permanent appointments could be increased through more active career management. One course of action could be to make regular secondments to business areas a necessary part of learning the job for all junior systems staff. Another could be to make secondments to line management positions outside the department a criterion for promotion to middle management in the systems department.

Henkel, a German chemical company, has realised the need to broaden the base of the skills and experience of systems staff, particularly those pursuing a management career, in which success is partly determined by establishing good contacts with a great variety of people. After four years with Henkel, junior systems managers get the opportunity to move to two or three jobs over a period of two years, either within the systems department or within other departments of the company. In another example, the human-resources function at Electricité de France believes that five years is the maximum that employees should spend in the systems department. Beyond this, staff get "too far into IT and too far away from the users".

Allied Dunbar has developed lateral career paths that allow movement both within the systems department and out to the business. To quote their systems manager, "We use our systems people in very broad roles on product design and new business ventures. Consequently, there is a steady trickle of transfers to other divisions of the company, and ex-analysts now run several of our operating divisions." As a result, Allied Dunbar loses more analysts to other divisions of the company than to other companies. Not only can it tempt potential recruits with attractive career prospects, but it is in a strong position to develop its 'partnership' role with the business. Its verdict is that the investment of management time to implement career-development plans is very worthwhile.

Management should be recognised as a separate career path

Systems professionals do not typically make good managers. Their high growth-need strength (which we explained in Chapter 3) may make project management and line management an attractive prospect, but this does not mean that they perform well. This is because systems professionals, as a group, need much less social interaction than other groups of professionals, and it is unlikely, therefore, that they will spend time promoting relationships either with their subordinates, or with their business peers. Those with management potential, and those with limited management ability who may be excellent technical performers, should be identified early. Separate career paths should be planned so that the former have an opportunity to develop their management potential, and the latter are offered an equally satisfying non-management career.

What most members lack, we have found, is a reliable way of measuring staff potential. Current performance is not always a reliable indicator, as Figure 4.2 showed. One approach that members could usefully adopt is the assessment centre, which has proved to be the most reliable method of assessing managerial potential in other industries. An assessment centre is a group activity where six to eight people meet for one or two days to go through several job simulations. The results are assessed by line managers to determine the individual's ability to perform the various jobs. The job simulation for a project manager might include reviewing the progress of a project team, negotiating with the head of a business function, or providing feedback on performance to a subordinate. These simulations are assessed and sometimes supplemented with other measures such as personality questionnaires (which we described in Chapter 3). The results are fed back to the individual, and his/her strengths, weaknesses, and potential are discussed. Management thereby gains an objective appreciation of potential, and the employee is given a preview of what is expected of a project manager.

Running an assessment centre does imply an investment of line management time. Given the importance of the need for a new breed of systems professional who feels comfortable with

business managers and is able to understand their requirements, line managers should find the investment of time worthwhile.

A suggested pattern of career development to replace the traditional vertical progression, which incorporates our suggestions for improvement, is illustrated in Figure 4.4. The main differences are that separate career paths for line and project management are explicitly provided, as are separate careers for technical and non-technical senior staff. With this scheme, all staff spend up to four years gaining a wide knowledge of the profession, with lateral movements between different roles encouraged. Career-development opportunities to move staff to and from business areas are identified and encouraged, perhaps as part of a company-wide career plan.

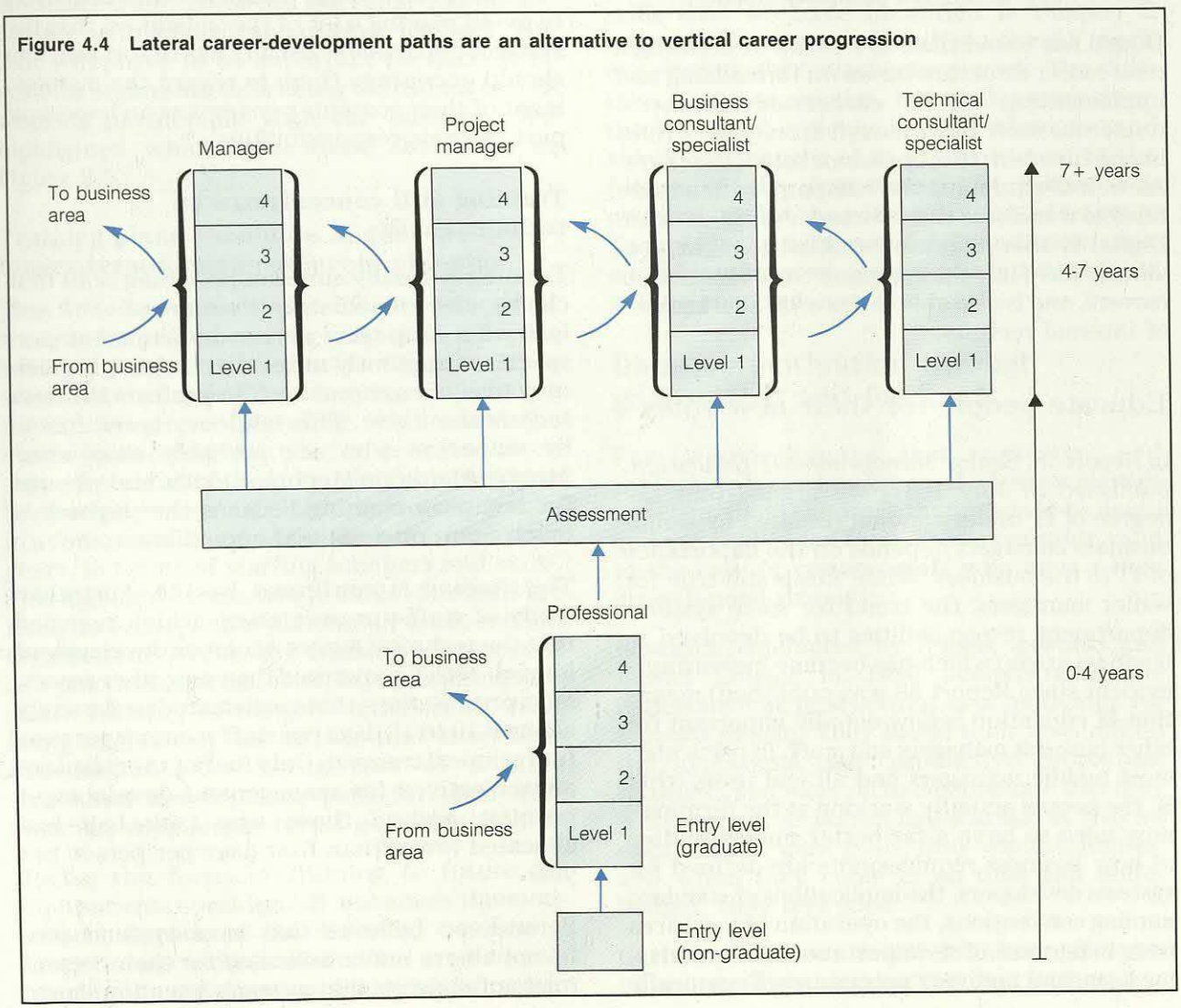
Many benefits accrue from planning career-development opportunities

Organisations that have actively developed career paths for systems staff have gained considerable benefits, the most significant being:

- Markedly lower rates of staff turnover.
- Greater scope for identifying sources of recruits.
- Greater communication with business areas, creating a closer working partnership.
- Removal of unsatisfactory career paths for technicians and broadening of the scope to introduce flexible reward schemes.

The following examples illustrate some of these points. In 1987, Fokker, the Dutch aircraft

Figure 4.4 Lateral career-development paths are an alternative to vertical career progression



manufacturer, was suffering from staff turnover rates 11 per cent above the industry norm. From an analysis of interviews with people leaving the company, Fokker found that uncertainty about future careers was a significant factor in causing people to leave. As part of a structured programme of improvements, Fokker implemented a new career structure that enables more lateral development to take place. Movement from one job to another is based on current job, the skills and preferences of the individual, and an assessment by the manager of the individual's capabilities. The career plan is backed up by a structured training programme, which provides a broad education for all employees up to six years after entry, after which employees pursue one of several specific career paths (such as consultant, or project leader). Staff-turnover rates for 1989 are forecast to drop below the industry norm.

Digital has found that, as a result of creating a new career structure based on formalising and implementing lateral career development, numerous staff have moved from junior roles in one function, to more senior roles elsewhere. As well as equipping the company with a more flexible workforce with a broader range of skills, Digital is able to retain staff who might previously have left the company to advance their careers, and is also able to draw on new sources of internal recruits.

Educate people for their new roles

In Report 58, *Senior Management IT Education*, published in July 1987, we argued that the degree of IT understanding required by senior business managers depends on the importance of IT to the business. While this is still true for senior managers, the trend for some systems department responsibilities to be devolved to business areas (which has become increasingly evident since Report 58 was published) means that IT education is now equally important for other business managers and staff. In particular, most middle managers and all end users (that is, the people actually working at the terminal) now need to have a far better understanding of how business requirements are defined for systems developers, the implications of standard naming conventions, the operation of local area networks, and the importance of security, back-up, and recovery procedures. Technically illiterate business managers can no longer be tolerated. While some organisations have taken steps towards educating their users, there is little evidence to suggest that user training is an important issue for most systems departments.

We think it is appropriate for systems directors to take a more active role in encouraging such training. To be really effective, it must be planned, systematic, and above all, aimed at developing the types of skills that are relevant to the emerging roles of the systems department. It could take many forms. Systems directors might, for example, offer secondments into the systems department, suggest that business managers send staff on internal courses organised for systems staff, run informal workshops or courses, or suggest appropriate external courses. This initiative could help users to avoid making a lot of the 'mistakes' that the systems department usually has to sort out, and should encourage them to regard the management of their computer systems as an important part of their responsibilities.

Training still concentrates on technical skills

Training is usually aimed at providing skills that can be used immediately. Pressure of work and lack of a long-term career-development perspective frequently mean that training is given only to equip systems staff to perform the next technical miracle. This tendency is reinforced by managers who are probably more comfortable identifying technical skills, and who opt for technical training because the payback is much more obvious and immediate.

This finding is confirmed by the Australian study of staff-turnover rates, which revealed that the technical aspect of career development is much better recognised than any other aspect. Most organisations that participated in the study allowed 10 to 15 days per staff member per year for technical training. Only half of them had set any objectives for management-development training, and of those who had, half had allocated fewer than four days per person per year.

Peter Keen believes that most systems professionals are under-educated for their current roles and suggests that as much attention should

be given to 'maintaining' people as is given to maintaining machines. By this, he means that people need 'maintenance' to avoid their skills deteriorating over time. He suggests that three types of education are required, which have to be tailored to the individual's role and career path:

- *Maintenance*: "I need to know about this to keep up in my career".
- *Development*: "I must acquire this as part of the knowledge that will enable me to move ahead in my career".
- *Innovation*: "This is not something everyone in my job needs, but it is important for my own personal growth".

The development and innovation aspects are the ones to which systems directors must now pay more attention. These are the skills that do not provide an immediate and obvious payback, but that will prove to be important for success in systems organisations seeking to foster a better working partnership with the business. We highlighted which skills these should be in Figure 2.5.

Training plans should be aligned with longer-term human-resources planning

The first step towards moving the focus of training from its current technical bias is to plan within a longer timeframe. In Chapter 2, we suggested that one of the advantages of aligning human-resources planning with strategic business planning was that it provided more scope for choice of action. We explained that the human-resources planning process results in a forecast of demand for the next one to two years, in terms of staffing numbers and skills. This highlights areas where skills shortages are likely to occur, and if planned in time, enables organisations to consider training existing staff as a practical alternative to, say, recruiting new staff. Training is thereby transformed from being exclusively an *ad hoc* and short-term expedient, to becoming part of a more structured development path for each staff member, with longer-terms goals included.

Moving the focus of training to future job requirements considerably enhances the motivational impact of the training, because it signals to the individual that he or she has a future in the organisation. It also helps to align individual aspirations with the needs of the organisation. Training that does not equip people for immediate job requirements, or for future planned career developments, should not be provided.

The time spent on training needs to be increased

Peter Keen suggests that systems people should spend at least 10 per cent of their time on training. This represents half a day a week, and is a considerable investment in staff development. Certainly, there is evidence to show that one of the characteristics of 'successful' companies, like IBM and Digital, is that they do provide this level of training. But is this reasonable for the systems department of the typical Foundation member? We think it is, because to acquire the types of non-technical skills that we have identified in Chapter 2 requires a mixture of both on-the-job work experience and formal course work. The skills take longer to acquire, but at the same time, they will not quickly become obsolete, and should be thought of as an investment in the future of the department. In Figure 4.5, overleaf, we list the possible sources of training. To provide the right mix of skills and knowledge, a combination of on-the-job and formal training will be required.

Improve motivation through goal-setting and feedback

Few would disagree that motivation and performance can be improved when employees are clear about the work that needs to be done, and are challenged by it. This is certainly valid in the case of systems staff who have a high growth-need strength.

Research conducted by Robert Zawacki and Daniel Couger in 1980 demonstrated the importance of goal-setting as a motivator for systems people. They based their research on the hypothesis that 'productive people are satisfied', and went on to demonstrate that they were correct. As Robert Zawacki said of systems staff, "They want goals, they want deadlines, and when they come in on time and under budget, they feel good."

Certainly, our own research has revealed this to be true. By analysing the data gathered as

Figure 4.5 The various sources of experience and training provide skills in particular areas

Training medium	Skill/knowledge: Project management skills	Organisational knowledge	Marketing/selling skills	Change management skills	Interpersonal skills	People-management skills	Business knowledge	Nature of the training
Work experience								
Networking						✓	✓	Informal contacts with peer group in other parts of the organisation.
Coaching	✓	✓	✓	✓	✓	✓		Personal, informal training given by line manager.
Mentoring	✓		✓					Personal informal advice/guidance given by non-line manager.
Job assignment	✓	✓	✓	✓	✓	✓	✓	Specific project role given to develop particular skill/knowledge.
Secondment		✓				✓	✓	Formal 'loan' of person to another business area/job to learn new skill.
Formal training								
Programmed instruction texts	✓		✓					Series of questions, the answers to which determine whether the learner should proceed or revise.
Computer-based training	✓							Software package.
Interactive video instruction	✓		✓		✓			Combines PC with video images, graphics, sound, and colour via a videodisc player.
Internal courses	✓	✓	✓	✓	✓	✓	✓	Courses designed specifically for an organisation.
External courses	✓	✓	✓	✓	✓	✓		Predesigned training courses available on the open market.

part of Butler Cox's Productivity Enhancement Programme (PEP), we found that systems departments with formal procedures for regularly setting goals and appraising performance achieve development productivity improvements. One PEP member with an exceptionally high productivity rating takes goal-setting very seriously. As productive people are motivated people, the message seems clear — goal-setting increases motivation.

Goals should be objective and measurable

The key to success in goal-setting is that goals are objectively defined and measured. An example of this is found at Security Pacific Automation Company, the California-based data processing arm of Security Pacific Corporation, a bank holding company. As part of a management-by-results programme, the company introduced 'commitment planning', to motivate and reward people for achieving the results specified in their service-level agreements. A commitment plan defined what each employee will accomplish during a specified time period, the different levels of performance that the employee can achieve, and the ways in which performance will be measured. The plan is negotiated between the employee and his or her manager.

For example, a financial-management commitment might be to reduce spending, where an 'excellent' rating would mean being 5 per cent under budget, 'above average' would mean 3 per cent under budget, 'average' would be on budget, and 'unsatisfactory' would be over budget. A few years ago, management felt that the bank was not promoting enough employees from within. Managers were then measured on the percentage of job vacancies they filled with bank employees. 'Excellent' was defined as filling 90 per cent of vacancies from within, 'above average' was 85 per cent, and so on.

IBM in Australia has staff-turnover objectives written into the performance objectives of every line manager from the Chief Executive down. In 1988, IBM Australia's actual rate of staff turnover was 8.9 per cent and its objective for 1989 is 6 per cent. Nothing could be more objective and measurable than that.

Rapid feedback on performance is critical

Robert Zawacki and Daniel Couger found that timely feedback on performance was critical to using goal-setting successfully as a motivator. Jobs that enable the individual to obtain feedback naturally and quickly from the work are intrinsically more motivating than jobs in which feedback is delayed. The nature of most systems work is such that a system designer, for example, may not know for several months whether the design of a system is good or bad. Systems managers therefore need to find alternative ways of providing systematic and timely performance feedback to their staff. The easiest option is to link the feedback process to the annual appraisal scheme, as most organisations already have these schemes in place. However, at all but the most senior level, annual appraisals are probably not frequent enough. Several of the participants in the Australian study we spoke of are moving to quarterly appraisals. The objective is to provide continuous feedback on performance and achievement.

The most satisfactory results, however, are achieved by moving the process of goal-setting and feedback outside the appraisal system altogether. Another PEP member with a high productivity rating prepares work-assignment briefings to cover the next 10 to 20 days of work for programmers, and 30 to 40 days of work for systems analysts. Each work assignment is formally appraised upon completion, and the appraisal is sent to the human-resources manager. This work-assignment and appraisal procedure takes place outside the six-monthly and annual formal appraisals, which are concerned with training requirements, salary reviews, and career development.

Reward achievement with performance-related pay

Research has shown that employee incentives, if carefully and fairly administered, can play a significant role in motivating staff, because they serve as a means of recognising and rewarding staff for work well done. If they are paid in a timely manner, they will also reinforce the goal-setting procedure discussed above.

On its own, salary is not a motivator

Several Foundation members have found that more job offers are declined for salary reasons than for any other. Organisations in the public sector, with less flexible salary schemes, have usually experienced a greatly increased rate of turnover when their salaries fall significantly below private-sector rates. Nevertheless, there is no evidence that high pay, while attracting recruits, can motivate staff and reduce turnover rates.

The status of pay as a 'hygiene' factor rather than a positive motivator was stated in the 1960s by Frederick Herzberg, Distinguished Professor of Management at the University of Utah. Certainly, no research that has been conducted since has been able to prove otherwise. Cor Alberts, a divisional director from CAP Gemini in the Netherlands, put it this way at a recent conference on recruiting and retaining information technology staff: ''IT staff want to develop and they want to have new challenges and to learn new things. The growth is important and the salary is only a yardstick, at least in the Netherlands. The salary is questioned because they need to get enough in comparison to other people in the IT profession, or in the company itself''.

Robert Zawacki explained that the 'money' issue is not how much systems staff earn, but is

concerned more with *equity vis-a-vis their perceived reference group* (our italics). In other words, salary is the device whereby employees measure the comparative value that different employers put on their skills. But Zawacki went on to explain, "The foundation is the money, and the job is the home you put on that foundation, but once the foundation is solid, they [systems staff] want something else — meaningful work". The message is very clear — it is essential to pay market rates, but when staff have achieved parity with, or even an advantage over, their reference group, salary alone does not motivate them.

Performance-related pay is a motivator

Bonus schemes have been used for years as a productivity incentive for blue-collar workers. There is now increasing evidence that performance-related pay is beginning to be used as a means of attracting senior managers in industries where competition for good people is fierce, and can now account for as much as 20 per cent of total remuneration. Where it is applied more widely, however, performance-related pay does reduce staff-turnover rates. There are three basic types — share options, results-related bonuses (often based on profitability), and individual merit pay.

Share options

Share-based schemes (which are usually based on an option to purchase shares in the future at a predetermined price) are not normally directly performance-related because share values are subject to all kinds of market pressures. These types of schemes are not, of course, available to public-sector organisations, and neither are they under the direct control of the systems department. Nevertheless, where share-option schemes do exist, as many employees as possible should be encouraged to join because they tend to generate loyalty to the company.

Results-related bonus

These can be organised at group (for example, project-team), department, or company level. At the project-team level, performance/delivery objectives are set at the beginning of the project, and bonuses are paid at the end, to an agreed formula, if the objectives are met. Departmental and company-level bonuses are similar in concept, but are usually based on criteria such as profitability. They are typically awarded separately from normal salary reviews, depend on how well the company performs, and are paid annually. Such schemes are not common in non-profit-making organisations where it is much more difficult to set performance objectives.

The Australian study of staff-turnover rates showed, however, that once bonuses are introduced, they can become institutionalised to such an extent that the company cannot remove them, even in bad times, and this considerably reduces their motivational impact. The study also revealed that the motivating impact of all bonuses falls as their relationship to the individual's performance becomes less direct.

Individual merit pay

Merit pay is an individual award, paid to an agreed formula, for meeting pre-agreed standards of performance. It is highly motivating because it is directly related to individual performance. While it can be divisive, and it can be demotivating for the poor performer, it works well for the majority of employees.

The lessons that companies have found to be the most important to the success of a performance-related pay scheme are that:

- The incentives must be paid in a timely manner, and be linked to short-term goals.
- The performance payment must be kept separate from normal salary payments.
- Payments must not be awarded as a matter of course; they must be related to measurable performance objectives and not awarded for average results.
- The goals set for performance must be mutually agreed and realistic.

In this chapter, we have described the four actions that we believe systems managers can take that will result in lower staff turnover and increased productivity — to manage the career development of their staff, to provide appropriate education, to set goals, and to introduce performance-related rewards. Systems managers are well aware, however, that staffing the systems function is not just a matter of motivating, developing, and rewarding in-house staff. However well they do this, there will always be occasions when the use of external

resources (outsourcing) is the best way of providing the business with efficient and responsive systems in a timely manner. While outsourcing undoubtedly provides a valuable source of skills, it does not relieve the systems manager of his management responsibilities. The task of ensuring that the business is well served is just as critical, whether the service is provided by in-house staff or by contract staff employed by computer-services suppliers. The management issues arising from the use of external resources are the subject of Chapter 5.

Chapter 5

Exploiting the computer-services market

As we have seen throughout the earlier chapters of this report, systems directors are being asked to provide a prompt and cost-effective service to an increasingly demanding and cost-conscious group of customers. We have also seen how their ability to deliver this service is constrained more by staffing issues than by technology. One of the options that systems directors should consider in their efforts to maintain an acceptable level of service to their customers is to draw on resources outside their own organisations, in particular by using contract staff who are employed by computer-services companies.

Our research revealed that the number of contract staff employed at the present time by Foundation members is approximately 10 per cent of total development and operational staff. A survey by Price Waterhouse involving 1,000 systems managers revealed that, where the number of contract staff is less than 25 per cent of total staff, increases of up to 10 per cent are planned; if the number is above 25 per cent, the planned increases are about 2 per cent. This suggests that organisations are prepared to have a maximum of around 30 per cent of their staff represented by contractors.

The computer-services market, which includes systems-integration services, packaged software, and facilities management, has now evolved to the stage where systems managers can seriously consider using the services to complement scarce in-house resources. Those contemplating this option do, however, need to be aware of the impact that the introduction of contract staff into the organisation might have on existing systems staff.

The computer-services industry provides a range of services

The computer-services industry continues to grow and mature in most countries, with a trend to higher-quality services, offered by fewer suppliers. Statistics from the European Computer Services Association, which represents computer-services companies in 16 European countries, reported revenue growth amongst its members of 20 per cent for 1988. Indications are that this growth is set to continue.

As the industry has grown, it has also gone through a period of significant restructuring. We expect that the industry will evolve to the stage where it consists of three main sectors — systems-integration services, packaged software, and facilities management. There will, however, be considerable overlap between these sectors, and a few suppliers will offer all three types of service. The nature of each type is described below.

Systems-integration services

Traditionally, the market for computer skills was very fragmented. Systems managers were faced with using contractors from different suppliers and providing the project-management resources to integrate them. Problems inevitably arose over maintaining consistent quality. The contractor market gained a bad reputation as a result of these difficulties, which was not helped by the 'body shopping' attitude that many suppliers adopted. Today's systems-integration companies provide a coordinated range of services which they offer in two main ways:

— By providing multiple skills. Few systems projects rely on one set of skills. It is common to find multiple hardware vendors, including suppliers of communications products, software tools, and business applications, involved in a single project. It is becoming increasingly difficult and impractical for systems managers to employ staff equipped with all of the necessary skills. Systems

integrators aim to fill this market niche by providing such skills, usually on a contract basis.

– By providing project-management expertise. In addition to providing specific technical skills, suppliers will now take on responsibility for the project management of contract staff.

Packaged software

Today's suppliers of computer software packages typically specialise in specific industries, rather than in specific hardware, and are likely to enhance the service they offer by providing industry-specific skills. Thus, in the distribution field, Arthur Andersen provides a full consultancy service backed by technical support and user training, via a specialist team, to support its DCS/Logistics package. CAP, a member of the SEMA Group, a European software company, has a specialist team to install and support its financial-consolidation package, MicroControl. In both cases, the teams are led by business professionals skilled in the area of package application. This means that, for non-core applications, it is possible to buy the package and install it without needing to involve internal systems staff. For core applications, however, systems professionals will need to ensure that the package conforms with the standards laid down for the software infrastructure.

Facilities management

Both traditional software houses and computer bureaux have extended their services to provide what is now known as facilities management. They have been joined by several new entrants who see the provision of these services as the means of opening the way to providing other systems services within an organisation. With this type of service, a contractor takes full management and financial responsibility for the whole, or a major part of, a systems function. Usually, many of the in-house staff are transferred to the facilities management supplier.

At present, facilities management is a small sector of the computer-services market, probably representing only 1 or 2 per cent of total systems expenditure. It does, however, look set to grow, driven by two factors:

– The established trend towards decentralising the systems function.

– The entry into this sector of some substantial companies such as Andersen Consulting, part of the worldwide Arthur Andersen accounting and consulting firm.

The services can be used to complement in-house staff

Systems managers should consider using the services offered by computer-services suppliers in three particular circumstances — where they are having to cope with peaks in the workload, where they require highly specialist skills in a multivendor environment, and where they can delegate routine, or non-strategic tasks that would otherwise divert skilled (and scarce) in-house staff from more important work.

Coping with workload peaks

The demand for systems skills will vary, and the use of outside staff to complement a core of permanent skills can make it easier to cope with workload peaks. At first sight, the cost of employing contract staff may appear high, particularly if their daily fee rate is compared with the *pro rata* salary of a full-time employee. However, once the full costs of employing staff are taken into account (health insurance, pensions, recruitment, training, and so on), and the number of productive days in a year are considered, the cost of a contractor will usually be only about 20 per cent more than the cost of in-house staff. Many systems managers will be prepared to pay a 20 per cent premium to obtain the staffing flexibility that enables them to meet short-term demands.

Acquiring the skills for a multivendor environment

More and more large organisations are moving to multivendor environments, where they will require more highly skilled staff to deal with the complexities of integrating different technologies. Computer-services suppliers have recognised this need and are increasingly able to supply a variety of skills that can, if necessary, be brought together for a single project. Some suppliers will also provide project managers to oversee the work of numerous outside suppliers. The systems manager benefits from dealing with a single source of supply, and obtains consistent quality. (The management issues associated with multivendor environments will be discussed in the next Foundation Report.)

Delegating routine tasks

Systems directors faced with difficulties in recruiting staff are finding it increasingly attractive to employ external staff for routine, non-urgent work, which would divert in-house staff from more important work. This approach might be appropriate for certain types of software maintenance, particularly where programs were originally written in a language or for a machine that is no longer used by the organisation. In this situation, a computer-services supplier may be able to provide staff with the relevant expertise. Esso in Australia has subcontracted part of its software maintenance work, and we expect to see a growing trend in this direction.

The response of in-house staff to the use of contractors requires sensitive management

Systems directors will often find it difficult to accept the need to call on the services of contract staff and may not, therefore, pay sufficient attention to managing the relationship with them. In particular, the response of internal systems staff to the use of outside contractors must be very carefully managed. Our research indicates that, in this context, systems directors have an important role to play in three areas:

- *Identifying the projects that it is appropriate for contract staff to be involved in*: If systems staff perceive that all the interesting work is going to outside contractors, they will very soon become extremely demotivated. Systems directors must take care to ensure that the projects they contract out are not those that the systems department is best equipped for, or those that in-house staff would be most interested in working on.
- *Defining the terms of reference under which contract staff are employed*: The respective roles of contractors and in-house staff must be made very clear. Employee relations can deteriorate very quickly, and staff turnover increase dramatically if contractors are asked to work alongside in-house staff, either to provide some specialist skill, or to be part of a project team, without their respective responsibilities being very clearly defined. Alternatively, systems directors might consider the possibility of contracting out complete, self-contained projects.
- *Ensuring that both parties learn from the relationship*: Both in-house staff and contract staff can benefit from the relationship if systems directors are prepared to make the effort to see that it happens. Clearly, where contractors are brought in to provide specialist skills, every effort should be made to ensure that such skills are transferred to the permanent staff. In-house staff may also benefit by being given the responsibility, where appropriate, for supervising contractors and acting as project managers. This will give permanent staff the opportunity to develop general-management and project-management skills, and so expand the scope of their own jobs.

Clearly, systems directors' main preoccupation will be with the response of their own staff, but it is important that they should not overlook the needs of the contract staff. They, too, need to be motivated and managed. They should be rapidly integrated into the culture of the organisation — treated in the same way as permanent staff, included in company communications, and not left to work in isolation.

Deriving benefits from the use of packages depends on having the right mix of skills

In Report 69, *Software Strategy*, published in May 1989, we discussed the merits of using application packages. We concluded that packages would nearly always prove to be a better investment, provided that they meet the essential requirements of the application. We described the emergence of soft packages, where it is possible to tailor the package to meet the specific application requirements. We concluded that this facility is likely to extend the use of packages still further because it removes one of the major objections to them — their lack of flexibility. Indeed, the potential benefits of using packages are now so great that the organisation's hardware-procurement policy may need to be modified so that a particularly

suitable package can be used. A major UK retail chain, for example, changed from ICL to IBM equipment for this reason. The change was justified even though it was going to take two years to retrain the 80 systems staff involved.

A package-led systems development policy for core applications will, however, have significant staffing implications for the systems function. The systems manager will need to allocate responsibility for defining application requirements and selecting packages, see that staff have the appropriate negotiating and liaison skills, ensure that responsibility for package installation is allocated and that staff are adequately equipped for this role, and confirm that staff can support and, where necessary, enhance the selected packages. While the use of packages will generally reduce the need for in-house development staff, those who are currently employed in conventional roles may not be the best staff to move into the roles associated with the use of packages. The new roles require a different mix of skills, and place greater emphasis on business, interpersonal, and project-management skills. The economic benefits to be derived from the use of packages depend critically on getting the right mix of staff and skills.

Requirements definition

The first, and most critical, stage in the successful use of packages is to define the business requirements that a package has to satisfy. Conventional development staff are not typically very good at doing this because they usually specify too much technical detail. In addition, identifying the potential suppliers of packages and preparing an invitation to tender require different skills from those usually found among development staff. There will need to be a close relationship (the partnership we have advocated throughout this report) between users and the systems department if this stage is to be completed successfully.

Package selection

In the past, users have played only a small part in evaluating and choosing application packages; most decisions have been left to the systems department. In today's business environment, it is much more critical for such decisions to be a joint responsibility, balancing a package's degree of 'fit' with users' needs, and its degree of 'fit' with the overall hardware and software infrastructure. The roles of users and the systems department in the various stages of the selection process are illustrated in Figure 5.1. Clearly, it would be an advantage if the user staff and the systems staff involved in package selection had the mix of skills that we have recommended elsewhere in this report — a good knowledge and experience of both technology and business applications.

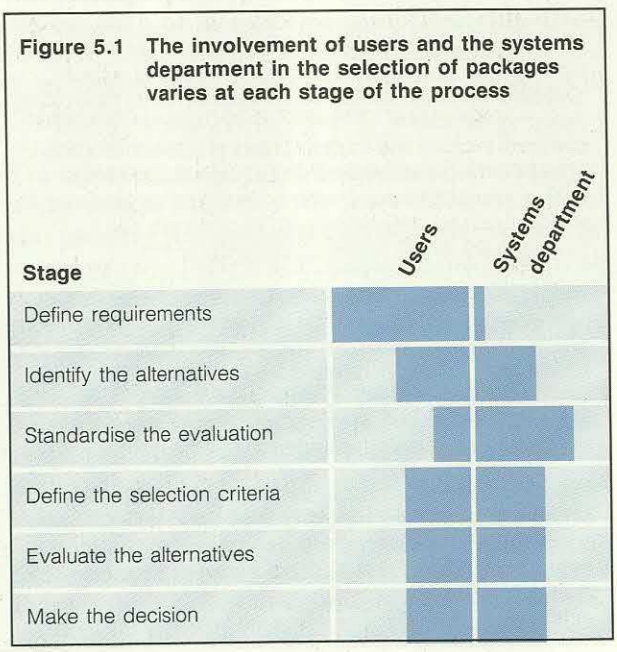
Negotiating

Once the decision to use a particular package has been made, it will be necessary to form a list of the contractual arrangements for acquiring the package. The package supplier will have standard terms and conditions that define the obligations of each party, but for large and important contracts, it may be possible to vary these. The systems manager should therefore ensure that he or she understands the full implications of the contractual obligations, and it would be prudent to involve someone from the legal department in these discussions. In many organisations, however, the user department will be paying for the package and will also, quite understandably, want to be party to the negotiations.

Package installation

Regardless of how carefully the business requirements were defined and the package was

Figure 5.1 The involvement of users and the systems department in the selection of packages varies at each stage of the process



selected, and how successfully the negotiations were conducted, the success of an application package will depend on the skills of the implementation team. These skills will be very different from those required to install bespoke systems developed in-house. Installation of in-house systems is the culmination of a creative development process, where the details and idiosyncracies of the system are well known. The staff involved are likely to be highly motivated at the end of the development process, and this carries through into the installation phase.

This is not so for packages. Here, the team will need to be multidisciplinary, bringing together application skills, training skills, technical skills, project-management skills, and business-procedures skills. The team will also need to include user managers who will be responsible for any organisational changes that have to be made to accommodate the package. Figure 5.2 describes how a multidisciplinary team, committed to the task of package implementation, might go about installing a particular financial-consolidation package, MicroControl.

Support and enhancement

A recent survey in the United States revealed that the average expenditure on software support and enhancement was 51 per cent of the total software budget. This proportion is expected to increase to as much as 90 per cent by 1995, reflecting the increase in the installed base of software, and particularly packages. Despite the increasing expenditure, and despite the fact that supporting installed systems often requires a higher level of skill than developing new applications, most systems departments pay insufficient attention to software support and enhancement.

Systems managers need to change their attitude towards support and enhancement. In particular, they should ensure that the status of the job is elevated and that the right type of person is assigned to the work, particularly in an environment where packages form the basis of a large part of the core applications portfolio and where the prospect of moving onto 'real' development work no longer exists.

It should be possible to offload most, if not all, of the maintenance work to the package supplier. One Foundation member told us that, for maintenance purposes, he treated the standard package and the peripheral enhancements differently. His staff were not permitted to touch the standard elements (except to insert amendments provided by the supplier); their

Figure 5.2 The installation of MicroControl demands a multidisciplinary approach

MicroControl is a PC-based package used to consolidate the management and statutory accounts of large groups of companies. The consolidation rules are built into the system, including methods of handling currency exchange, inter-company trading, and multiple layers of sub-consolidation. The system is parameter-driven. During installation, the package is customised to reflect a particular organisation's structure, accounting periods, account codes, and management- and financial-accounting reports.

Training in the use of the package takes one week and subsequent customising of the software can be completed in one to two man-months for an organisation consisting of 200 subsidiaries. This work is best done by an accountant or a systems professional with extensive accounting experience. In practice, most users of MicroControl have identified a new role, that of the systems accountant.

Following customisation, the installation phase becomes largely technical. Each reporting subsidiary has a personal computer that runs MicroControl and that collects financial data, which it transmits to a central personal computer. The central personal computer is usually LAN-based to allow for multi-user working in the centre of the organisation. It can take one day per site to install the package, and a similar amount of time (excluding travel) to establish the communication facilities. The skills required during the implementation stage are:

- Financial, to liaise with users on the application.
- Training, to train users in the subsidiary companies.
- Local area networking, to establish a central networking facility.
- Wide-area networking, to establish the links between subsidiaries and the centre.
- Personal computing, to load and install software on the subsidiaries' PCs.
- Knowledge about MicroControl, to deal with queries arising from the subsidiaries during installation.

MicroControl is marketed worldwide, and all agents for the product will provide assistance and training in all of these areas. However, most organisations have found that they need to create their own team to install MicroControl. They insist that the composition of this team should be very carefully planned to ensure the right mix of personalities, and business and technical skills.

responsibilities were to modify and support the customised periphery. Staff working in this area will need to be skilled in interpersonal communication and problem solving. They must also be flexible and patient, and must have experience both of the computer technology used and of the main business areas in which the package will be used.

There is a case for facilities management but the staffing implications are significant

Suppliers of facilities-management services are aware that they are generally perceived as a threat by systems directors but claim that they can provide a higher level of service at a lower price. They have won some significant contracts as a result. Users have found that employing facilities-management companies provides them with three main types of benefits.

First, the use of facilities-management services can insulate systems departments from the skills shortage. Facilities-management suppliers have found that the skills shortage is a powerful argument in marketing their services both to government bodies and the private sector. Government bodies have found it particularly difficult to attract systems staff because of the constraints imposed by their salary scales. Using facilities-management services has enabled them to get around these constraints by transferring their systems staff to the service supplier and buying services back. In the private sector, facilities-management services have proved extremely useful when companies have relocated to areas where it has been difficult to recruit the full staff complement. Hoover, a major white-goods manufacturer in the United Kingdom, retained the strategic-management and business-analyst functions when it relocated, but contracted out responsibility for operational and development services to a facilities-management supplier.

The second benefit of using facilities-management services is that they can help to cope with organisational and technical change. Periods of organisational upheaval often create a climate of uncertainty in the systems department, as they do elsewhere in the organisation. A European manufacturing company that we met during our research had undergone tremendous organisational change. Following several acquisitions, the company was significantly restructured. It saw facilities management as a way of enabling the company to pursue its strategy without having to devote a lot of attention to the evolution and development of its information systems. At a time when a systems department is involved in the development of new systems, suppliers of facilities-management services can also play a useful role in taking over the responsibility for staff, hardware, and service provision for the old systems that are in the process of being replaced, leaving the user organisation free to concentrate on the development work.

The third benefit is that facilities management can provide price predictability. This is the major advantage claimed by facilities-management suppliers. It is a seductive claim, but in practice, price predictability is likely to be a real benefit only when the services provided change very little from what was specified in the original contract. Systems environments do not stay static, however. The contractual terms of facilities-management suppliers, while allowing for change, usually specify a cost-plus charging basis.

Whatever the benefits to be derived, all facilities-management contracts will have staffing implications because giving a service provider full management and financial responsibility for all or part of a systems function will often involve transferring staff to the supplier, and it is these staff who, at least initially, will continue to provide the service.

Transferring staff as part of a facilities-management deal is probably the most difficult part of the process for the systems director. While the supplier will offer the promise of improved career prospects, there will inevitably be a period when staff will be unsettled and apprehensive. The decision on who to transfer will be based on the service that the supplier is going to provide. Systems directors can smooth the transfer process by being supportive, open, and constructive in their dealings with all the staff likely to be affected.

Once some systems staff have been transferred to the facilities-management company, those remaining in the systems function may perceive

their career opportunities in the depleted group as being rather limited. Staff turnover is likely to increase as a result. Systems directors will need to re-establish a positive team spirit, by recruiting staff for the new environment as quickly as possible, and making clear to all staff the rationale for using facilities management. It is essential that a good working relationship be established between the in-house staff and the facilities-management supplier.

We have shown in this chapter how the computer-services industry has developed to the stage where it can now offer Foundation members an established range of services that are a viable option to the use of in-house staff, and that will play a greater role in the future as the competition for staff continues to intensify. The use of computer-services suppliers does not, however, relieve systems directors of their obligation to manage. All those who contribute to the business, whether permanent staff or contractors of one sort or another, need leadership, a framework in which to function, and an understanding of the role that they are playing in the business as a whole. It is these aspects of managing staff that are the subject of Chapter 6.

Chapter 6

Creating an environment in which staff will excel

In the earlier chapters of this report, we considered various steps that systems directors might take to prepare for the more demanding role that the systems function will have to play in the future. From an examination of best practice in the industry, we have provided practical advice on defining the new roles of those involved in providing a systems service to the business, introducing more effective methods of human-resources planning and recruiting, offering better opportunities for career development, introducing payment schemes that are more closely allied to performance, and using external resources where such an option is appropriate. These recommendations cannot, however, be successfully implemented in isolation. They need to be complemented by a management style that encourages and motivates staff to perform to the best of their abilities.

Every organisation has access to the same resources, in terms of the technology, the tools, and the people it requires to run its systems. Yet, there are enormous differences in the performance of systems departments. Productivity varies greatly, staff turnover varies greatly, and perhaps more importantly, the standing of the systems department within the organisation varies greatly. These discrepancies can all be traced back to the way in which staff are managed, and it is this, more than any other factor, that distinguishes the really successful systems department from the less successful one.

The onus is on management to create an environment in which systems staff will excel, and thereby make a greater contribution to the success of the business. The management style required to create such an environment was highlighted by Tom Peters and Robert Waterman in *In Search of Excellence*, where they set out to identify the factors that distinguish really successful companies. They showed that, although modern management tools and techniques (such as management by objectives and quality circles) are useful, they do not guarantee success. Peters and Waterman believe that the secret of success is to create an environment where people, not investments in capital equipment, are seen as the primary asset of the business.

The ways of achieving this are often described in terms such as "management by walking about", "open-door management", and "caring for the whole person". Regardless of the terminology used, the aim is to create an environment that is 'people-oriented', where there is a strong *esprit de corps*. In such an environment, staff will feel part of a team with common objectives, but at the same time, know that their individual efforts will be appreciated and acknowledged.

We have identified three aspects of staff management that warrant particular attention if the environment in the systems department is to be one in which staff can excel — adopting an appropriate style of leadership, ensuring that the systems function is structured to support efficient and effective operation, and aligning the work of the department with the changing needs of the business.

Adopt an appropriate style of leadership

Keeping people highly motivated and productive is, above all, a question of leadership. As the role of the systems department becomes more complex, different styles of leadership will be acceptable, and indeed, appropriate, depending on the nature of the work environment and the role of the systems function within it. In the systems area, however, staff have traditionally

been promoted into management positions on the basis of their technical skills, and the new responsibilities being placed on them as the systems department becomes more closely aligned with the business are not necessarily those that they are best qualified to take on. Far more attention should be paid to potential management capability, and systems staff should have these skills developed before they assume management responsibilities. Others will continue to make better use of their skills in non-managerial roles.

The style of leadership will depend upon the work environment and the role of the systems department

In *Managing for Excellence*, David Bradford and Allan Cohen defined three leadership styles — the technician, the conductor and the developer. Each may be appropriate in particular circumstances, as illustrated in Figure 6.1. Often, though, the best solution will be a mixture of all three.

The *technician* style of leadership is where the manager is given authority by virtue of his or her technical knowledge — the manager is then in a position to tell others what to do *and* how to do it. Information is usually passed up to the leader in a one-to-one relationship, and control and direction is then passed down. Although the focus is on technology rather than people, this style can be appropriate in situations where greater knowledge in the manager is desirable, such as in training subordinates, or dealing with an emergency. However, the technician style of leadership can be very inflexible, with the direction given to staff depending on the knowledge of the manager. In times of slow technical development, this may be acceptable. At other times, it will inhibit progress. The main limitation of this management style is that it can undermine subordinates, who will be closely supervised, and required to perform within the constraints of tightly controlled tasks.

The *conductor* style of leadership gets its name from its similarity to the role of a conductor of an orchestra. This style provides subordinates with a greater degree of autonomy than the technician style, with the subordinate activity coordinated by the 'conductor' manager. The manager is now removed from technical work. He or she is concerned, instead, with planning and control. It is therefore a good style of management when many independent subordinates must be pulled together, particularly if the alternative is that personal priorities would otherwise dominate. The main disadvantage of this style of leadership is that the manager is responsible for all coordination. Subordinates do not develop wider skills, and where interdependencies exist between team members, the manager is called upon to provide the mechanism for interaction.

The *developer* style of leadership is akin to the role of a sport's team coach. The manager's role is to combine inspirational direction-setting with demands for high performance. This is done by

Figure 6.1 The relevance of leadership styles will depend upon the work environment

Work environment	Leadership style: Technician	Conductor	Developer
Subordinates work independently	✓		
Subordinates do simple tasks	✓		
The environment is stable	✓	✓	
Subordinates have limited technical knowledge compared with that of the boss	✓	✓	
The commitment of subordinates is not needed for success	✓	✓	
Subordinates do complex tasks		✓	✓
Subordinates require considerable coordination		✓	✓
The environment is changing			✓
Subordinates have a high level of technical knowledge			✓
The commitment of subordinates is necessary for excellence			✓

✓ Indicates the situation where the particular leadership style is appropriate

(Source: David Bradford and Allan Cohen. *Managing for Excellence*. London: Wiley, 1984.)

being supportive, and passing on knowledge that helps the subordinate grow. Initiative is encouraged through an open and participative leadership style. Complex tasks are tackled by a multidisciplinary approach in which individual task objectives are secondary to common departmental objectives. The main management task with this leadership style is to build a team in which common objectives are shared and organisational and individual needs can be reconciled. Subordinates are continuously exposed to demands to develop their skills and rectify their weaknesses as part of their job, making it a particularly relevant management style for working environments that are subject to rapid change. Above all else, with this management style, there is always a strong emphasis on the worth of people. It is therefore a good example of a 'people-oriented' style. Figure 6.2 describes the experience of a German company that has successfully adopted this approach to managing its staff.

During our research, we found examples of systems managers practising each of these styles of leadership. However, we found little evidence of an understanding of when each would be most relevant. In Figure 6.3, we show how the different leadership styles relate to the four main roles for the systems function that are described in Chapter 2. The developer style of management will be quite appropriate for the business-services role. In this role, innovation is to be encouraged and staff are expected to challenge conventional wisdom and to seek novel ways of enhancing organisational performance through the use of information technology. The business-support role requires a combination of the developer and conductor styles of leadership. The conductor style is predominant in the development-support role, and will also be appropriate for the technical-services role, where management is concerned with implementing well-defined technical solutions via a team of skilled technical staff. Figure 6.3 shows that a purely technician style of leadership is inappropriate for the management of systems staff. It does nothing to satisfy the high growth-need strength of systems staff, and is likely to lead to high rates of staff turnover.

Figure 6.3 Each of the roles of the systems department will tend to favour a certain style of leadership

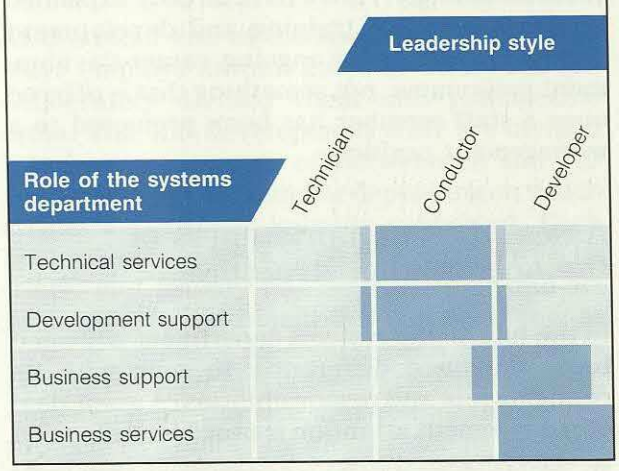


Figure 6.2 A German chemical company attributes its commendable staff-retention record to its open, innovative management style

Henkel

Henkel, a German chemical company that is still owned by the Henkel family, employs about 220 systems staff, and in recent years, has had a deliberate policy of widening the skills of those staff. Henkel uses development tools, but told us that this was not the main reason for its success in increasing development-staff productivity and retention. The company attributes its success in this area to the way in which people are treated, which is based on an open, innovative management style and an emphasis on individual training and development. Henkel believes that staff efficiency depends on whether people feel good in their working environment, which implies the removal of all formal and impersonal management practices. All staff are encouraged to take part in decision-making, through regular reviews of team and departmental performance at which overall strategy and direction is formulated.

Staff are recruited from schools and universities, but in both cases, can expect further training and development at Henkel. In the case of school leavers, this involves a six-year development programme. A recent innovation is the junior-management development programme (which was described in Chapter 4). This programme has been running for about three years and is extremely successful because it provides a high level of motivation, even amongst those not taking part. The latter are motivated because they know that they can apply to go onto the development programme if they wish.

Henkel has a particularly enviable staff-retention record (turnover has been about one per cent for the past few years). The company attributes this to the people-oriented management style that is the primary focus of the systems management team.

Leadership skills need to be assessed and developed

The tendency in the past to promote staff to systems-management positions on the basis of their technical ability means that systems staff frequently have little regard for the management skills of their superiors. Systems management is not a role for which all technical staff are naturally suited. There is a growing emphasis on the ability to manage people, for which an open, participative style is required, and where responsibility and authority are delegated, and the characteristics required to be a good manager of people are not necessarily indicated by good technical performance.

There is therefore a need to identify those systems staff with the potential to pursue careers in management and train and develop them accordingly. As we have already explained in Chapter 4, this training and development should be part of an ongoing career-development programme, not something that is offered once a staff member has been promoted to a management position.

Assess the appropriateness of the organisation structure

In the future, the systems department will need to be organised differently to cope with its changing role and responsibilities. A great deal of management attention is now being directed to the reorganisation of the systems function. Not all of this effort, however, is being directed at creating the organisation structure that will ensure the most efficient and effective support for the business. Many systems departments are reorganised in response to pressure from dissatisfied users, who demand that their most pressing problems be solved as quickly as possible. In such cases, the underlying cause of the problem is often an inappropriate leadership style set by the systems management team, and such re-organisations will solve nothing in the longer term.

Other restructuring is taking place in response to the diverse business and technological pressures that influence systems strategy. Restructuring has occurred on the basis of technology areas, business products, type of information technology service, and corporate management style (particularly whether to centralise or decentralise). In many cases, this type of change can be beneficial, but it can often be short-term and divert management attention from other issues associated with staff management. Those organisations that have successfully restructured have paid close attention to two issues that can greatly influence staff motivation and performance — span of control, and unit and team structure.

Span of control

Span of control (that is, the number of staff controlled by an individual manager) is a complex issue. There is no ideal span of control, although in many systems departments, there would be virtue in increasing it. Many layers of 'management' have been created simply as a means of providing a so-called career structure — a hierarchy up which staff may be promoted. With each 'manager' controlling a small number of staff, the organisation structure becomes deeper and less flexible, communication, both vertically and horizontally, becomes difficult, and motivation levels decrease because a large proportion of the workforce finds itself 'hidden' under more and more 'management' layers.

Apart from the skill of an individual manager, and the experience of those being managed, there are four factors that influence the decision on the appropriate span of control:

- *Complexity*: The greater the complexity of the work being supervised, the narrower will be the span of control.
- *Variety*: Only a situation of constant change requires a high level of management attention and a narrow span of control.
- *Skills mix*: The extent to which the skills vary within a manager's area of responsibility will determine the span of control. A limited number of skills implies a wider span of control.
- *Structured activities*: The degree to which the tasks of subordinates can be structured will influence the span of control, with highly structured jobs lending themselves to a wider span of control.

One way in which systems managers can increase their span of control is to delegate more authority and responsibility to their staff. In

Chapter 3, we referred to Robert Zawacki's research into the characteristics of systems staff. He found that systems staff have a high growth-need strength, and identified the desire for autonomy as one of their personality characteristics. Systems managers can meet this need for autonomy by delegating authority and responsibility to self-managing units.

One Foundation member had successfully 'flattened' his systems organisation in this way, and considered that his systems department was more flexible and responsive as a result. Motivation had increased, although he was having to work harder at career development. He described his previous organisation structure as 'multiple ladders' — staff could aspire to promotion on their particular ladder. With fewer ladders, he was producing more all-rounders by making lateral career development possible. The role of systems management in this structure was to coordinate the activities of largely self-managing teams, created to carry out a particular task and existing only until that task was complete.

We entirely support the principle of flatter organisation structures. Hierarchical structures are more suited to an environment where management's role is to control. Management's role in the systems function is to develop staff, to coordinate effort, and through resources planning, to support the business. Flatter organisations with wider spans of control and a 'developer' style of leadership will become far more appropriate.

Unit and team structure

In recent years, many large organisations have restructured a large centralised systems department to create units of a manageable size. One Foundation member who had restructured in this way described it as creating 'organisational villages with the facilities of cities'. Large units are difficult to manage, difficult for staff to relate to, and have a tendency to become bureaucratic and ineffective. On the other hand, very small systems departments are unable to attract and retain staff or to provide the range of services required by the business.

A unit of around 50 staff appears to be the optimum size. This size of unit allows people to relate, on a personal basis, to other members of the unit, while allowing management to develop a commitment to shared objectives and values. The optimum is determined by the way in which people relate to each other, not by the technology currently being used for systems development. Thus, future developments in technology are unlikely to change the optimum size for a development unit.

Noble Lowndes, a UK financial institution, told us that it attributed its low staff turnover and high staff motivation to having a systems department of only 50 people. As part of the larger TSB Group, Noble Lowndes is able to be self supporting and yet call on other autonomous units within the TSB Group for specialist skills. Within this structure, management and staff can relate to one another, objectives are shared, and nobody ends up as a 'small fish in a big sea'.

At the other end of the spectrum, British Airways employs around 2,000 IT staff, but has deliberately divided them into manageable units. The 750 development staff are divided into business centres of between 20 and 120 people, the precise number depending on which airline department is being supported. Each business centre has a close relationship with its users, and usually has between four and six project teams (although this can be as few as two, or as many as eight). Each team has a project manager and between two and 20 staff, depending on the size and complexity of the project. By combining an increase in the span of control with delegation of responsibility to self-managing teams, British Airways has achieved high levels of staff motivation and retention, despite the difficulties associated with managing such a large systems department.

Research carried out for the Butler Cox Productivity Enhancement Programme (PEP) has shown that the productivity (measured in terms of the efficiency with which program code is created) of the best and the worst software development teams can vary by a factor of up to 11. This is a high price to pay for failing to attend to the management of teams. Systems managers should therefore pay careful attention to the following five points highlighted by the PEP research:

— *Team size*: A team size of five or six is ideal in terms of defining and allocating

responsibility and accountability, ensuring communication between team members, and improving staff commitment and involvement.

- *Team skills*: Particularly at the early stages of a project, when team members are involved in non-routine work, teams benefit from a mix of skills and personalities. Generalist skills can be used to complement specialist skills. Dissimilar personalities will work better at the problem-solving stage of a project because each will stimulate the thinking of the other.

- *Team selection*: The ability of team members to form a closely knit working unit will increase productivity. One method of ensuring a high degree of team cohesion is to allow team membership to be decided by the team members themselves. This approach is not suitable for selecting team members at the problem-solving stage, however, because it is unlikely to lead to the optimum mix of personalities.

- *Team leader*: The primary role of the team leader is to influence, assist, and motivate team members, and the productivity of the team is more likely to be influenced by the leader's ability to do this than by his or her technical ability.

- *Team composition*: Several Foundation members deliberately move their staff between teams. The injection of new blood has a motivating effect on staff and enhances team productivity. Rotating staff in this way also increases the job interest and skills of the individuals concerned.

Ensure that the systems department serves the needs of the business

In Chapter 2, we described how the roles and responsibilities of the systems department are undergoing fundamental change. These changes mean that it is no longer appropriate for systems managers to preoccupy themselves purely with technical matters. A wider business-oriented focus is now required.

Systems managers are still too preoccupied with technology

The traditional emphasis on technically oriented jobs in the systems department is increasingly being replaced by the need to provide business-oriented support and to work in partnership with the user community. Development and other technical roles will, of course, continue to exist, but as tools automate much of the work, more non-systems staff will be involved in these traditional areas of systems work. We have argued that systems management must take account of this change and become more creative in terms of recruiting and retaining staff. Unfortunately, the background of many systems managers means that they still seek job satisfaction in technical areas, and regard staff-management issues as less important. This is hardly surprising because, as Robert Zawacki's research showed, technically oriented systems staff have a low need for social contact and simply do not see the need to relate to other people.

A technically focused systems department will generally be inward-looking. Clearly, systems directors are responsible for managing the investment that their organisations have made in technology, but they must recognise that success in using IT increasingly comes not from the equipment and software, but from the way in which it is used. This requires strong leadership from the systems director, who must be able to motivate his or her staff to perform in the most efficient and effective way.

Systems managers must take a broader business-oriented view

Ciba-Geigy in Italy has experienced just such a shift in focus. During the 1980s, this organisation has moved its systems department away from the conventional operations and development role to a consultancy and innovation role. The traditional functions have not disappeared, however. The role of the systems department has been strengthened by the fact that it now works in a partnership with user departments, where its role is planning for and organising the application of IT. The emphasis is on developing people to ensure that systems opportunities can be exploited. Innovation is encouraged and success is measured, not in technical terms, but by the extent to which support is provided for the business.

Most systems directors realise that their departments should broaden their focus to encompass business as well as technical issues. There is less agreement about how this should be achieved. We have identified three areas which warrant greater attention from systems management — being involved with the business, putting the customer first, and attending to emerging systems priorities. Each is fundamental, each requires a broader perspective, and each involves a people-orientation.

Being involved with the business

In Chapter 2, we distinguished between core and non-core applications development, and suggested that systems managers' responsibilities were increasingly being defined in terms of managing core applications. Core systems exploit IT and provide the infrastructure on which user departments can build their own applications. It follows that investment in core systems involves business risk. To take responsibility for this business risk, systems directors will need a thorough understanding of, and empathy with, business strategy and processes. They can acquire this only through a close working relationship with senior executives. One Foundation member told us that he had been promoted and was now eligible to dine in the directors' dining room. However, he rarely went because he found that he and the other directors had "nothing in common to talk about". We believe that by taking this attitude, he is missing a vital opportunity to widen the focus both of his department and of his understanding of the business.

Putting the customer first

The technically oriented systems department can easily lapse into a mood of comfortable indifference to customer needs. As we pointed out in Report 66, *Marketing the Systems Department*, this is an inappropriate position to take, because user departments are increasingly able to provide their own systems solutions, either directly or through third-party suppliers. Systems directors should encourage a marketing attitude so that the entire systems department (and staff) becomes market-driven. Managing all aspects of the communication between the department and its 'customers', through which a partnership develops with user departments, should be an overriding priority.

Attending to emerging systems priorities

To ensure that the systems department is in the best position to manage the organisation's investments in hardware and software, the main priorities for the systems director to attend to are:

- *Setting policies and standards.* Devolution of the responsibility for application development is a firmly established trend. Systems directors have the opportunity (and the responsibility) to ensure that IT permeates the organisation in a coordinated manner by setting standards and policies, and ensuring that they are adhered to throughout the organisation.
- *Systems integration.* For most organisations, it is impractical and unrealistic to expect to maintain a single-vendor computing environment. Outward-looking systems directors are recognising this, and are ensuring that they are in a position to provide both support and development services for the emerging multivendor environments. (In the next Foundation Report, we shall consider further the issues associated with managing multivendor environments.)
- *Using subcontractors.* The traditional, inwardly focused systems department may have been reluctant to use subcontractors. The outward focus requires greater objectivity and a willingness to use the most appropriate resources to provide the systems services required by the business.
- *Gaining knowledge about business opportunities.* The role of the systems department is to act as a catalyst by seeking opportunities to enhance business performance through the exploitation of information technology. This role cannot be performed by isolating the department from the rest of the business. Instead, it requires the highest levels of interpersonal communication skills, persuasion, and tenacity, combined with technical and commercial awareness.
- *Transferring relevant technical skills to users.* The outward-looking systems department will recognise that business units are increasingly willing and able to develop their own non-core applications, and will realise that encouraging this trend will strengthen its 'partnership' with the user community. User involvement should be perceived not as a threat, but as an opportunity. However,

in order to ensure that the systems department is capable of successfully transferring the relevant technical skills to users, the implications for systems staff must be attended to. Paramount amongst these is the need to ensure that systems staff receive the training that will help them pass on the relevant skills in terms that the users can relate to.

In describing the need to refocus the systems department's activities, we have implied that this is the responsibility of the systems director. Since change of this type is usually initiated from the top of a department, the implication is correct. The systems director must therefore ensure that the changes filter down through his or her department. This can be facilitated by appropriate recruitment and training policies. The place to start, however, is with the department's management team. Do they share the same vision? Do they communicate this effectively to their staff? Are they successful in marketing the systems department and its services to business users?

In this chapter, we have discussed three aspects of staff management — leadership style, the organisation of the systems department, and the focus of the systems department. Systems directors who have attended to these areas of their responsibility have been able to create a people-oriented environment that their staff find motivating, challenging, and a pleasure to work in. As a consequence, they are rewarded with lower staff turnover, improved productivity, and an enhanced standing in the eyes of their customers.

Report conclusion

In this report, we have described the actions that systems directors can take to alleviate the staffing difficulties being experienced by many Foundation members. A checklist of the actions is given in Figure 6.4.

There has always been a shortage of staff with specific skills, and we have argued that this will continue to be the case. Systems directors are also having to cope with the effects of two other trends — the demographic changes in the population of most Western countries, which means that there will be fewer young people entering the job market, and the devolution of some systems responsibilities to business units, which changes both the numbers and the mix of skills needed in the systems department.

The short-term response of continuing to pay higher salaries is not working — staff-turnover levels are a major impediment to the productivity of many systems departments and now

Figure 6.4 Checklist of actions that can be taken to alleviate the staffing difficulties being experienced by many Foundation members

- Ensure that the respective roles and responsibilities of systems and user staff are clearly defined.
- Link the systems staffing plan to the business plan, paying more attention to personality factors and flexibility in planning future staff requirements.
- Widen the sources of potential recruits and encourage staff transfers to and from business units.
- Adopt a marketing approach when recruiting staff, and improve the process of selecting candidates by making greater use of personality tests. Do not delegate the responsibility for recruiting to personnel specialists.
- Pay attention to matching a job to the job holder's aspirations.
- Make explicit career-development opportunities available for systems staff (particularly by providing lateral development opportunities) and use training to develop a stronger business-orientation and better management skills throughout the systems department.
- Enhance the levels of motivation in systems staff by using goal-setting and feedback techniques.
- Motivate staff by adopting performance-related payment systems.
- Use external services, where this is cost-justified, to complement internal staff resources. Ensure that internal staff are equipped to manage and use these services effectively.
- Recognise that the productivity and effectiveness of the systems function depend on the people-management skills of the systems management team. Ensure that the IT-management team is equipped to focus on people issues.
- Attend to people issues by adopting a people-oriented management style.

threaten to affect the stability of businesses that are more and more dependent on systems support. Against this background, we recommend that systems directors urgently turn their attention to staffing issues.

They must seek to minimise the inconvenience caused by the shortage of skills and the high rates of staff turnover by adopting alternative methods of staffing the systems function, and providing a working environment in which staff are encouraged to build a career. Business changes do not make their task any easier, but neither are they a justification for neglecting this critical management obligation. Dealing with staffing issues on a longer-term basis than has been common in the industry will demand a great deal of management time and commitment.

Implementing the actions listed in Figure 6.4 will require a substantial investment of time and effort, but the investment will be justified if staff who are suited to the new demands being made of the systems function can be encouraged to build their careers in an organisation while making a worthwhile contribution to its success.

Bibliography

Bradford, D L & Cohen, A R. *Managing for excellence: the guide to developing high performance in contemporary organisations*. London: Wiley, 1984.

Cascio, W F. *Applied psychology in personnel management*. London: Prentice-Hall, 1987.

Cascio, W F. *Managing human resources*. 2nd edition. London: McGraw-Hill, 1989.

Couger, J D & Zawacki, R A. *Motivating and managing computer personnel*. Chichester: Wiley, 1980.

Establishing systems department credibility. *I/S Analyzer*, vol. 26, no. 7, July 1988.

Handy, C. *The age of unreason*. London: Hutchinson, 1989.

Institute of Manpower Studies. *Switching on skills: new approaches to skill shortages in electronics and IT*. London: National Economic Development Office, 1989.

Keen, P G W. *Roles and skills for the IS organization of tomorrow: an ICIT briefing paper*. London: International Center for Information Technologies, 1987.

Lehman, D H. Improving employee productivity through incentives. *Journal of systems management*, March 1986, pp 14-20.

Peters, T J & Waterman, R H, Jnr. *In search of excellence: lessons from America's best-run companies*. London: Harper & Row, 1982.

Reddin, W J. *Managerial effectiveness*. London: McGraw, 1970.

Virgo, P. *The IT skills crisis: a prescription for action*. Manchester: NCC Publications, 1987.

Zawacki, R A. How to keep eagles: can you hold on to the best programmers on your staff? *Computerworld*, 27 July 1987, pp 51-57.

BUTLER COX FOUNDATION

Butler Cox

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

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

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

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