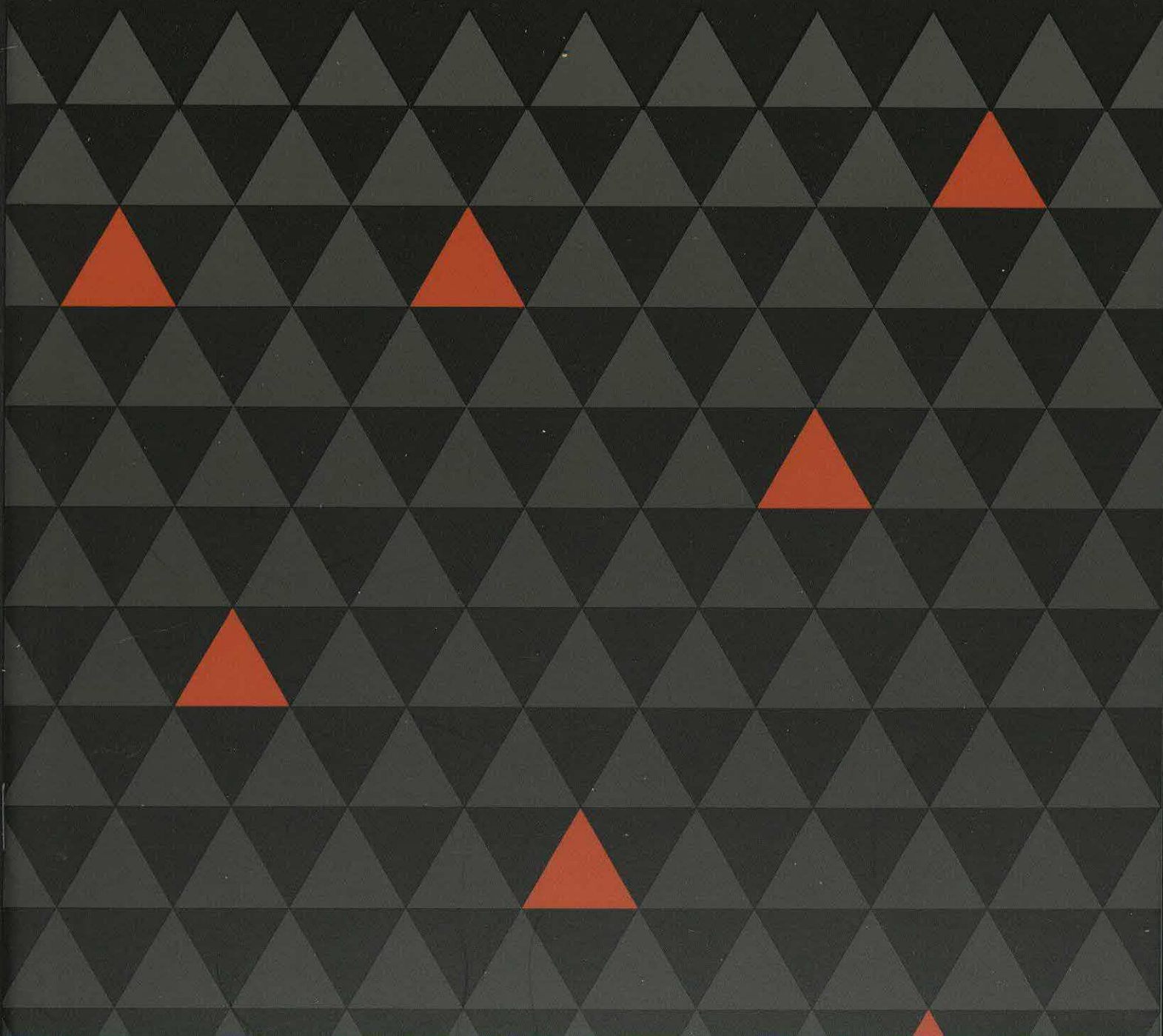


Information Centres in the 1990s

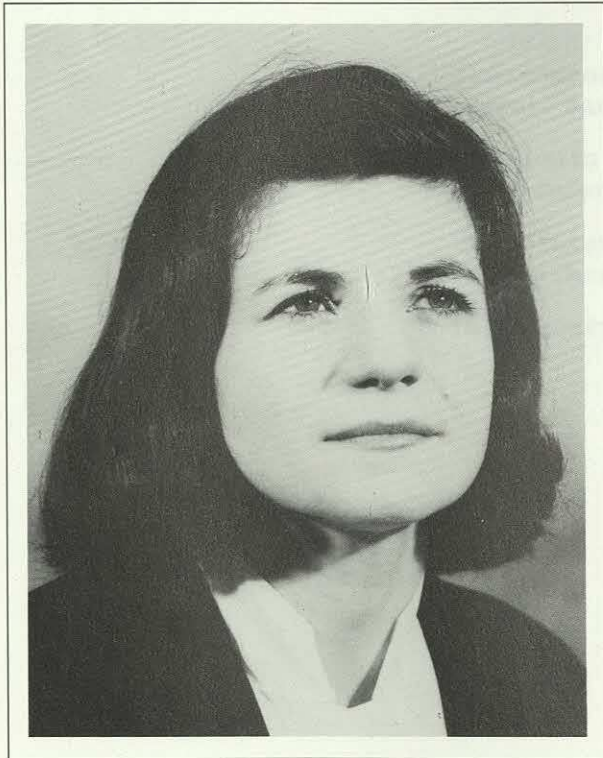
BUTLER COX
FOUNDATION

A Paper by Janet Cohen
February 1990



Information Centres in the 1990s

A Paper by Janet Cohen
February 1990



Janet Cohen is a principal consultant with Butler Cox in London, with experience across a broad spectrum of information technology. She has a special interest in end-user-support issues, which she investigated as part of her research for Foundation Report 65, *Network Management*. Prior to joining Butler Cox, she spent three years with the Telco Research Corporation in the United States, working on a range of consulting assignments.

Since information centres were introduced in the early 1980s, the demands placed upon them and the environment in which they operate have both changed quite dramatically. Although they are continuing to absorb more resources, they often seem unable to provide the service that users want. Corporate management is therefore beginning to question the commercial value of maintaining information centres, and those who set them up a decade ago are wondering if their task is complete.

We believe that the information centre will still have a role to play in the 1990s. End-user computing, however, will be a very different phenomenon from what it has been in the 1980s, and this will have a profound effect, both on the functions and services that the information centre provides, and on the general principles on which it operates.

(The American case history material in this paper was provided by Barbara McNurlin, who until the summer of 1989, was editor of *I/S Analyzer*. Butler Cox acknowledges the significant contribution that Barbara McNurlin made to the preparation of this paper.)

Published by Butler Cox plc
Butler Cox House
12 Bloomsbury Square
London WC1A 2LL
England

Copyright © Butler Cox plc 1990

All rights reserved. No part of this publication may be reproduced by any method without the prior consent of Butler Cox plc.

Photoset and printed in Great Britain by Flexiprint Ltd., Lancing, Sussex.

Information Centres in the 1990s

A Paper by Janet Cohen
February 1990

Contents

The environment in which information centres operate has changed dramatically	1
Changes in the environment are affecting the role of the information centre	3
In the future, the emphasis must be on helping users to help themselves	3
In summary	11

Information Centres in the 1990s

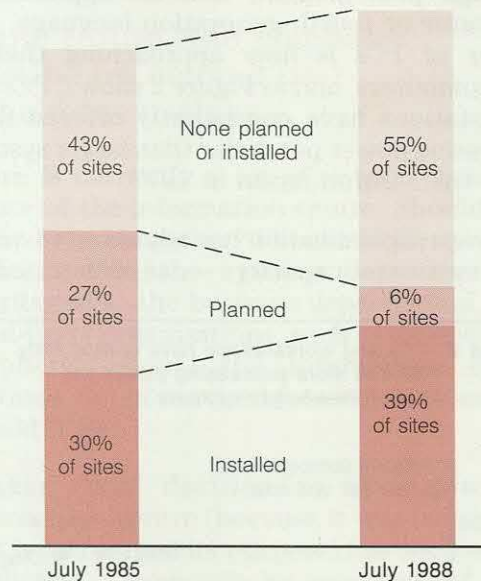
The information centre came into being in the early 1980s as the corporate response to the personal computer, or more specifically, to the phenomenon of end-user computing. End-user computing differed significantly from traditional data processing. It brought new opportunities for exploiting IT, and a new set of problems, particularly in terms of support. Many existing systems departments had little interest in personal computers, so information centres were established as separate identities to encourage and service end-user computing. Others grasped the opportunity more positively, but still recognised that end-user computing required a different set of support services from those offered by the systems department. The objective of the information centre was both to promote use of personal computers and to support users.

In the decade since information centres were first introduced, the demands placed upon them and the environment in which they operate have changed markedly. In spite of the fact that they are absorbing more resources, they seem unable to provide the service that users now expect. While new ones are still being set up, the rate of growth is much slower than was planned a few years ago, as Figure 1 illustrates. Corporate management is starting to question the commercial value of maintaining information centres, and some of those who set them up in the 1980s are beginning to ask if their task is finished.

We believe that the information centre will still have a role to play in the 1990s in promoting the technologies and applications of end-user computing. In the 1990s, however, end-user computing will be quite different from end-user computing in the 1980s, and this will have a profound effect both on the functions and services that the information centre

Figure 1 The rate of growth of information centres is much slower than was planned a few years ago

Many of the US IBM and plug-compatible mainframe sites planning information centres in 1985 did install them, but the increase fell short of what was planned. The diagram is based on approximately 15,000 sites in 1985, and 16,000 in 1988.



(Source: Computerworld, December 19, 1988)

provides, and on the general principles on which it operates.

The environment in which information centres operate has changed dramatically

Since the 1980s, personal computers have become much more widely used for a far greater range of applications. There have been dramatic advances in technology, and end-user computing has become a critical component of many

organisations' IT strategy. All these changes have had a marked effect on the type of service that the information centre has been called upon to provide.

In most large companies, those who want access to a PC now have it, and an increasing proportion of people are using PCs. (Foundation members averaged one workstation between three white-collar personnel in 1988.) Wider usage has meant wider product familiarity, and has also resulted in a greater spread in skill levels. At the same time, a greater range of applications has become possible. In the early 1980s, the well equipped PC featured a word processing package and spreadsheet. Now, it has a database, a desktop publishing package, some specialist presentation-graphics facilities, an outliner (or 'thinking aid'), a communications package plus modem, and an applications-generator or fourth-generation language. The power of PCs is now approaching that of minicomputers, and as Figure 2 shows, PCs and workstations have consistently offered more processing power per dollar than larger systems since their introduction in 1977.

Software sophistication has advanced to match the hardware capacity — as illustrated in

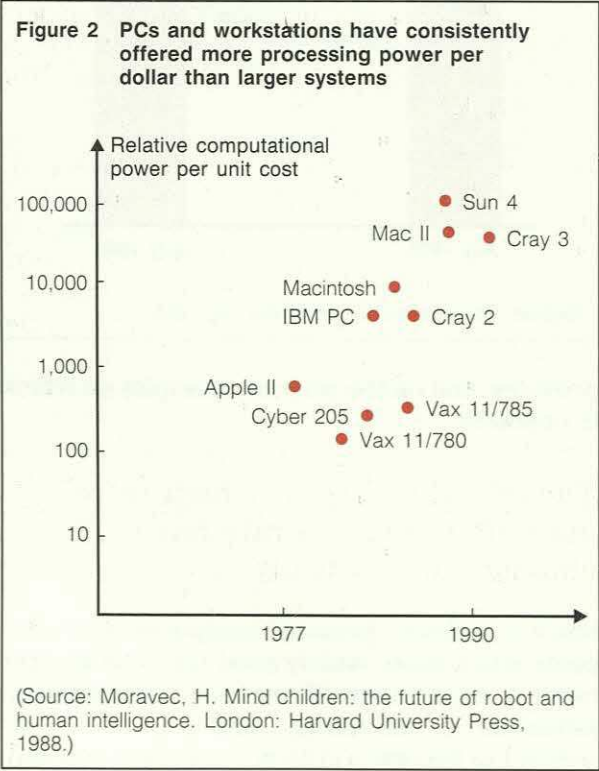
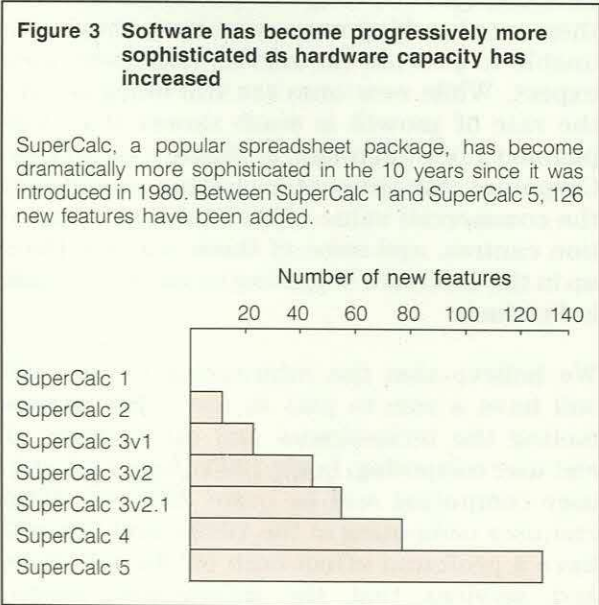


Figure 3, which shows the growth in the number of features of just one popular spreadsheet package. The growing range of functions and commands tells only half the story, however. The use of customising options means that a user's word processing package may have been set up in a different way from that with which the support desk is familiar. Moreover, the availability of programming facilities (at the level of a database query language or a spreadsheet macro) introduces the possibility of users generating their own applications — and their own bugs.

As the use of PCs within an organisation has grown, so has the demand for links between them. PCs are increasingly linked together via local area networks, and/or linked into main-frame systems for data access and manipulation. They can therefore no longer be considered in isolation from the mainstream concerns of the systems department generally. Distributed databases, and applications that use them, will become much more widespread in the 1990s, making PCs an integral part of the mainstream systems infrastructure.

As a result of these developments, PCs have taken on a strategically important role in the use of IT by an organisation. The rationale for installing the first PCs centred on efficiency — typically, the use of a word processor to reduce the time wasted on redrafting and retyping. Over the years, the emphasis has changed



towards effectiveness — enabling employees to perform their tasks in new, more effective ways. As the 1990s approach, the emphasis is changing once more — information technology is increasingly being seen as critical to a company's ability to compete. PC applications are no longer just individual aids, but are an essential part of doing business — examples include financial spreadsheets and order-entry systems on portable PCs for use by sales staff. End-user computing must therefore increasingly be viewed as a critical part of information technology strategy.

Changes in the environment are affecting the role of the information centre

The aim of every information centre is to encourage user expertise and the wider adoption of new computing technology. However, the increasing number of users, the spread of their skills, and the range and growing complexity of the packages used are, in many cases, straining the resources of the information centre. A major difficulty is user confusion over where the source of a problem lies, as well as who to turn to to sort it out. This difficulty arises because PC applications are often assembled in a piecemeal fashion and have a variety of configurations, which means that it is often difficult to distinguish between hardware and software problems. The growing number of links between PCs and mainframes also increases the difficulty of pinpointing the cause of a problem.

To make matters worse, information centres have sometimes encouraged dependence by providing too much support at the lowest levels. This is known as the 'directory enquiries effect'. (Research by PTTs has shown that where the service is free, many telephone users will call directory enquiries even if the printed directory is within arm's reach.)

The resulting overload means that the information centre provides a poor service. The problem is that most users have a broad but shallow knowledge of most applications and deep knowledge of the one particular area that is vital for their job, whereas they expect the information centre to have a deep knowledge of every possible area.

When they do not get the level of service that they expect, users will turn to whoever appears to be most helpful and knowledgeable. This may be a vendor or it may be the self-styled 'guru', found in many business departments. Multiple sources of advice often do more harm than good, by encouraging the use of diverse and non-standard products, leading in turn to considerable confusion.

Although the efficacy of the support is falling, the cost of supplying it is rising constantly, and this is causing senior management in many organisations to question the whole rationale for such support. All of the trends indicated here will continue, and indeed, increase. There is therefore a clear need for some kind of change in the role and organisation of the information centre.

In the future, the emphasis must be on helping users to help themselves

There is currently a lot of debate about the future of the information centre. Should it be phased out altogether? Should its functions be centralised in the systems department, or distributed to the business departments, or to third-party organisations, such as independent suppliers? Should the information centre continue, but in a revised form? If so, what form should it be?

Quaker Oats' decision to shut down its information centre (because it was considered that it had served its purpose) has been widely publicised — especially by opponents of information centres. The case histories in Figures 4 and 5, on pages 4 and 5, demonstrate the different but equally radical policies of two less publicised examples. The most appropriate policy for a particular organisation depends largely on a more fundamental management issue: the delicate balance between the benefits of individual creativity and expedient solutions to problems, and the need for corporate discipline and standards to ensure quality and reduce future problems.

In our view, the key issue is not whether the information centre should continue to exist separately from the systems department. What is important is to ensure that coverage exists for

Figure 4 With careful planning, many information-centre activities can be turned into sources of profit

The county of Los Angeles (LA)

LA county employs 80,000 people in some 40 departments, from law enforcement to libraries. Each department has its own information systems group, and most have at least three end-user computing staff.

The central information centre has 25 staff members. It was recently merged into a new internal services department. County departments can now buy services either from this department or from outside firms. Thus, for the first time, the central information centre has become a profit centre. Information-centre management has identified four areas in which it believes that it can commercially exploit the knowledge and expertise of the central staff — the franchising of end-user computing, the development of 'education and awareness' products, the establishment of a technology review centre, and the promotion of alternative service-delivery systems.

Franchising of end-user computing

The purpose of franchising end-user computing products and services is to make local end-user computing groups more self-supporting. Four franchising products are available now, and a fifth is being considered:

End-user computing support plan: A local end-user computing group pays the central end-user computing group to help it draw up a plan to support its department. Such a plan includes policies, marketing, and end-user-computing support-group functions.

End-user computing handbook: The handbook compiled by central staff explains the end-user computing services available from the local as well as the central group, and answers the questions most frequently asked by county employees on end-user computing.

'How-to' booklets: The first 'how-to' booklet explained terms, described software and hardware configurations for a desktop publishing system, and showed sample page layouts. The central group creates such products and sells them to local end-user computing groups to give to their customers.

Rotating clinics: The purpose of rotating clinics is to pass the expertise of the central staff on to the members of local end-user computing groups. In this service, central staff members visit a local end-user computing group for a day or two and help them in any way they can — training their new end-user computing staff, helping them to prepare new marketing materials, and so on.

Central help desk: The central group is contemplating establishing a toll-free help desk that local end-user computing groups or their clients may use. It would be managed by a specialist outside firm.

Education and awareness

The central information centre is developing five 'education and awareness' products:

Technology conferences: These are full-day conferences, free to any LA county employee. Attendance so far has been very encouraging. It is hoped that these conferences will help reduce the number of 'unauthorised gurus' promoting non-standard products.

Newsletters: The end-user computing group uses desktop publishing technology to publish a two-colour, four-page, monthly newsletter.

Directory of applications: To reduce the duplication of software applications, the central group has created a list of end-user computing applications developed within LA county departments.

Product announcements: Each month, the central end-user computing group sends out 15 to 20 announcements of new products, which it has evaluated.

User group meetings: The central group encourages and coordinates the formation of user groups among county employees, to encourage an exchange of ideas, and an awareness of what is possible with computing.

Technology review centre

The technology review centre is a permanent site where examples of end-user computing hardware and software are on display. Its purpose is to help improve information technology buying decisions within the county. It provides demonstration rooms and equipment that employees can use for an hourly fee, and also offers some professional services.

Alternative service-delivery systems

This is a strategic service. An example of the concept is a prototype touch-screen kiosk, developed by the group, which contains a microcomputer and printer. It is selling this kiosk to the various county departments as a new way of delivering information to its staff. The kiosk is the end-user computing group's first alternative service-delivery project. The group hopes that it will encourage county employees to think of new ways of using information technology to provide information to the public. It plans to suggest other public-access systems, including facilities to let the public carry out transactions with the county.

In summary, the central end-user computing group is acting as a coordinator, and pushing the day-to-day support and implementation work out to the local end-user computing groups. In this way, it is gaining the maximum commercial benefit from the expertise of central end-user computing staff.

Figure 5 One large company has pilot tested a system for grading support problems

Corning, Inc

Corning, Inc, with its headquarters in Corning, New York, manufactures specialty materials, from ceramics to optical fibres, as well as consumer and industrial end products.

Since the central end-user computing group was formed in 1981, the number of users has grown to 3,000. The end-user support group, now called client-support services, found end-user computing support to be 'a black hole' — the more it gave users, the more the users wanted. They were barely supporting the sophisticated users of more diverse information technology.

In 1988, top management directed all departments to keep budgets flat — despite a growing user population. Client-support services needed a way of providing more effective end-user computing support with fewer resources. They sent a one-page survey to 120 people in one department; 83 were returned. Most of them used software packages, but a surprising number developed their own applications and helped others solve problems. Even more interesting, more managers than staff said that they wrote their own programs and helped others to solve end-user computing problems. When asked where they looked for end-user computing help, the respondents said that they preferred to ask another user, the division business manager, or an information systems staff member (which includes client-support services), rather than the help line.

In follow-up interviews, the study team found two categories of end users who helped others to solve end-user computing problems. One type are *mentors*. Mentors are proficient in one or more products; they most often help new users to become proficient with a product. The second type are *facilitators*. These are work-group supervisors and managers who believe that it is important to move ahead with information technology. They understand the relationship between technology and their business, and they look for new ways to use computers — sometimes even strategic uses. Both mentors and facilitators performed these end-user computing roles informally, with no recognition from management.

They decided to exploit this talent by formally drawing mentors and facilitators into an end-user computing-support network. They created job descriptions for mentors and facilitators. One manager agreed to let three of his people test out these new part-time roles.

The new approach has five levels of problem-solving support. Level 1 is new and novice users.

Client-support services suggests that these users seek answers to their questions either from documentation, from online help screens, or by attending a training session. If they cannot get a question answered from these sources, they ask a Level 2 user — a mentor or a proficient user.

When Level 2 users encounter a problem, they have more resources available to them. Since they can articulate their problem, they can call the help line. They are also encouraged to contact other users whom they have met in Corning user groups. If they cannot get their question answered from these sources, they go to a Level 3 problem solver — their facilitator.

The facilitators determine where a problem or request should be handled. To assist them, client-support services has developed a 'yellow pages' directory of computing resources. Facilitators can also draw on mentors and business managers. Up to Level 3, therefore, much of the support comes from within the business unit — from mentors, proficient users, and facilitators.

Level 4 questions involve large systems development and assessments of technology. These areas are handled by information systems staff. If they have problems answering a question, they talk to the information systems business manager.

Level 5 is concerned with choosing among information technology options and strategies. These questions are handled by the information systems business managers. Thus, the people who handle Level 4 and 5 questions are full-time information systems professionals.

The first facilitator in the pilot test now spends 20 per cent of his time in his facilitator role. Since encouraging the use of information technology is now a legitimate part of his job, he has accepted responsibility for implementing a new system within a year. He has ranked his ten subordinates by their computing knowledge, and has developed training plans for them. He also encourages his two mentors in their new role.

Thus, in order to provide better end-user computing problem-solving support without increasing staff size, Corning is adopting a new strategy for end-user computing. It found that some training, trouble-shooting, and even strategic support can be offloaded to knowledgeable users, making them official participants in a new 'network' of user-support personnel. It is pilot testing this arrangement in one department, and expects to implement it in other departments during 1990.

PC-related activities, and that the coverage includes each of the areas indicated later in this paper. Whether the information centre is distinct from, or forms an integral part of, the systems department will depend largely on corporate culture — in particular, on the extent to which systems department staff accept that end-user computing and PCs are a valid and integral part of an organisation's information systems.

It is disturbing that many users feel that there is still a cultural divide between them and the systems department. This arises, in part, because some systems development departments have little requirement to use PCs. One manager in McDonnell Douglas, the US aircraft manufacturer, remarked, "Our systems department is PC-illiterate". Acceptance of PCs by systems staff is bound to increase in the long term as applications become distributed across microcomputers, minicomputers, and mainframes, and as the distinction between them becomes increasingly blurred.

All of the PC-related service activities described below are aimed at helping users to help themselves. In the past, many information centres have declared their role to be just this, but the reality has been quite different. Unless information centres really do make this their aim in the 1990s, the problems seen today will get much worse. We have identified four key operating principles that should be applied to the range of functions and services offered by a typical information centre in order to implement this policy.

Four principles should underlie the services offered

The functions performed and the services offered by the information centre in the 1990s should be guided by four main principles — aiming for cost-effectiveness, provision of a graded response, encouragement of independence, and formalisation of policy and planning:

Cost effectiveness: Information centres must concentrate their attention on high-value activities — rather than shoot at everything that moves. The experience of the county of Los Angeles, described in Figure 4, is an excellent example of how cost-effective end-user

computing support can be provided. Some companies have taken the principle of high value to the extreme of turning the information centre from a cost centre to a profit centre. This may be appropriate in some corporate environments, although in our view, it is more of an accounting decision than a fundamental issue.

Graded response: Serious problems (those that could make a noticeable impact on the business of the organisation) dictate an intensive response; minor problems can be handled more casually. One way to implement a graded response is to recognise that different levels of problems should be handled by different people. This is an intuitive notion, but it is currently implemented in an ad hoc manner. The way forward is to define, clearly, what types and levels of problems may be encountered, and then to whom, and how, the queries are to be referred. The approach taken by Corning, Inc, described in Figure 5, is one of the most explicit formulae we have seen.

Encouraging independence: Give someone a fish, say the international relief agencies, and you feed them for a day. Teach them how to fish and you feed them for life. Teach them how to make fishing rods and you feed the whole community. This concept is equally applicable to the problem of supporting PC users. The emphasis of training must shift away from basic product training towards encouraging users to understand the possibilities available on their workstations, and the services available from the information centre, so that they can devise more appropriate solutions to their problems. Furthermore, means must be found (and traditional training is not necessarily the most appropriate) of encouraging users to get more from their packages by making better use of the facilities available. The use of macros on a spreadsheet, for example, not only increases efficiency; it can also eliminate some user-generated errors. However, users should also be aware that the use of macros can make errors even more difficult to spot, because spreadsheets are notoriously difficult to check and frequently contain errors.

Formalisation of policy and planning: Instead of suffering the conflict between individual creativity and the need for discipline, information centres should create an environment that

gains the best from both. The guiding principle should be that the information centre will not impose its standards on issues that are not critical. Thus, it may rule that users are free to select whatever outliner/thought-aid package they feel most comfortable with (provided they do not expect support from the information centre), but that all presentation material is to be prepared on a particular desktop publishing package.

The functions and services offered in the future will fall into nine categories

Different information centres will be configured in different ways, but the range of functions and services that they should offer can be broadly categorised under nine headings:

- Help desk.
- Training.
- Application queries.
- Promotion of new technology.

- Application development.
- Bridging the gap between PCs and mainframes.
- Setting standards.
- Identifying business opportunities.
- Routine maintenance.

Applying the four key principles will bring about significant changes in each of these functions. Some will require greater emphasis within the information centre; some should be shifted outside the information centre; others will continue at the same level, but will need to be organised in a planned rather than an ad hoc fashion. The objectives of the support function in each area of end-user computing, and the role that the information centre will play in meeting these objectives, are summarised in Figure 6.

The help desk

The increasing integration of PCs into local area networks, and with mainframes, means that

Figure 6 The support function has different objectives in each area of end-user computing

Support area	Objectives	Approach	Role of information centre
Help desk	Reduce the number of trivial queries. Integrate with large systems.	First-level support within business department. One number to call. Managed by the systems department. Automated where possible.	Familiarise help desk with new products.
Training	Reduce the drain on information centre resources.	Low-level training by 'mentors' in each department. High-level training by dedicated in-house facility or outside agency.	Identify need for training, select suppliers, and monitor. For specialist needs, prepare training material in-house.
Application queries	Solve at business-department level.	Identification of mentors and clear allocation of responsibilities.	Disseminate application-specific material.
Promotion of new technology	Keep abreast of technology while maintaining standards.	Better communications with users.	Drive, rather than be driven.
Application development	Encourage user-developed applications in a disciplined fashion.	Education in application generators and better use of software.	Recognise and promote the evolving nature of end-user computing.
PC/mainframe links	Facilitate interworking and data downloading.	New forms of documentation and training materials.	Provide interfacing expertise.
Setting standards	Maintain standards without destroying expedient solutions.	Differentiation between critical and non-critical applications and procedures.	Establish and maintain appropriate standards, including maintenance issues.
Identifying business opportunities	Encourage users to identify opportunities for new applications.	Training of users in methods and possibilities.	Provide tools and information on new applications within the company.
Routine maintenance	Eliminate unnecessary information centre involvement.	Standards, automation, and use of local suppliers.	Supervise only.

a help desk dedicated to end-user computing is not only an expensive luxury — it is becoming increasingly counter-productive. In our view, the help desk needs to be consolidated under the auspices of the systems department, which may then choose to pass particular queries on to other people if greater expertise is required to solve them. Physically centralising the help desk may be impracticable, but the principle is that any particular user should have just one number to call.

It is not, however, appropriate that all queries should get as far as the help desk. Information centres need to establish the principle that trivial user queries ('I can't get it to come up on the screen') and application-specific queries ('How do I enter this invoice in dollars rather than pounds?') should be dealt with inside the business department, by peers or designated 'mentors'. The experience of Corning, Inc, described in Figure 5, is an excellent example of this system at work.

Help desks should also be looking for ways of using automation to improve efficiency. Possibilities range from using simple tools like Carbon Copy that enable a help-desk operator to take direct control of a remote machine, to expert systems for fault diagnosis and tracking. Many help desks currently do not even make adequate use of fault-logging systems.

With responsibility for managing the help desk passing over to the systems department, the information centre will have a continuing role in familiarising help-desk staff with new products that it is promoting. All too often, in the past, the help desk has been the last to know about such developments.

Training

As the generic applications of end-user computing are increasingly becoming part of basic business and office skills, it is time to re-appraise the type of training provided to users. Ideally, it should form part of any general induction course or procedure for new recruits. These days, it is probably no more difficult to learn how to use a basic word processor than it is to learn how to use a sophisticated telephone system or an expenses claim sheet. Not all employers operate an explicit induction programme, but even those who do tend to treat

information technology separately. This is an anachronism.

Once a user has a basic working knowledge of PC operation and generic word processing and spreadsheet applications, the best way of familiarising himself with new packages is through peer-level advice within his business unit, and through manuals. More detailed training requires specialised skills and is best provided either by a dedicated training group within the organisation, or by external training organisations.

The information centre should have a continuing role in training, but it should be less reactive and more planned. It should identify the need for particular types of training within the organisation, select suppliers, and monitor the quality of the service provided. Where appropriate facilities cannot be found, the information centre should develop its own training courses or materials, which may include applications specific to the organisation. The county of Los Angeles, whose experience was described in Figure 4, shows how the production of training materials and courseware can even be turned into a source of revenue.

Application queries

Many application queries require a knowledge of the user's business area. They are best answered by someone who has both knowledge of that business area and more specialised computer knowledge. Furthermore, he needs to be accessible, preferably working in the same office or area. Again, the important thing is to formalise the procedure, both to ensure that adequate coverage is available, and that those who are able to provide such help are not prevented from performing their line jobs by sheer volume of demand. The Corning case history in Figure 5 includes the results of a trial study of this nature.

The information centre should continue to encourage the dissemination of application-specific information (obtained from thorough journal searches, suppliers, and other user organisations) and to promote the formation of application-specific user groups, as well as the more usual product user groups.

Promotion of new technology

The promotion of new technology is a very important future role for the information

centre, and must be properly planned. In the past, the information centre has often accommodated new technologies only when users have purchased them and need support. In the future, the onus for selecting and promoting new products must lie with the information centre. This does not mean, however, that it should encourage the adoption of every new word processing package that comes to market. Many users are reluctant to abandon a product with which they have considerable experience for a new product that appears to offer little additional value.

The information centre should monitor new word processing packages for features that would provide real cost-saving benefits to users within the organisation. While following procedures to maintain standards and quality, it must adopt a policy of frequently and rapidly introducing new tools. It must, at the same time, be sensitive to the learning difficulties of users with experience of tools of a similar type, explaining the benefits of the new tool, and ensuring that conversion routines and quick comparison charts exist to ease transition problems. It must also become the focus for the promotion of expertise and the spread of knowledge. The information centre will have failed if users are more up to date than it is about general-purpose products on the market.

Most information centres have explored very few of the possible mechanisms (such as newsletters, conferences, videos, and permanent technology showcases) for effectively promoting new technology. Figure 4 provides an excellent example of creative thinking in this area.

Application development

It is not the role of the information centre to move into systems development work. Rather, the information centre should encourage users to develop their own applications. This means that the information centre must encourage users to make better use of existing facilities (recording macro routines for spreadsheets, for example), and must introduce application-generator packages, ranging from sophisticated databases to fourth-generation languages. It is unrealistic to try to prevent users developing their own applications. Some industry observers believe that within a decade, 80 per cent of all applications will have been generated by users.

There are, of course, risks associated with encouraging user-developed applications. Indeed, a very clear role for the information centre (working in close cooperation with the systems department) is to lay down standards for such applications. Nor should all applications be developed in this way — anything that involves the modification of central corporate data should be developed (or at least directly supervised) by the systems department. This means that the systems department will need to acquire relevant PC expertise, if it does not already have such skills.

Bridging the gap between PCs and mainframes

An increasing proportion of PCs are being linked into mainframes, either directly through a modem or communication adaptor such as the IRMA card, or indirectly through a local area network gateway. The 1990s will see the increasing adoption of PCs (rather than dumb terminals) as the universal workstation, and of truly distributed applications, including databases. Increasingly, PCs will handle all user-interface software, releasing the mainframe to handle data access and processing. Bridging the gap between PCs and mainframes requires particular knowledge and skills, largely because of the different data formats used by mainframe and PC software packages and operating systems. Users often underestimate the difficulties involved in extracting the required data from corporate databases in an intelligible format, and in the future, the information centre will have a major new role providing this interfacing expertise. Again, the key will be to provide this expertise in a way that encourages the users to help themselves. This may mean new forms of documentation and training materials specifically related to mainframe/PC application links.

Setting standards

A traditional role of the information centre is to set standards for procuring end-user computing hardware and software. In future, this role must be expanded to include standards for the development of applications by users (which must be compatible with, or part of, overall systems standards), and for routine back-ups and maintenance. On the latter point, the information centre should again make maximum use of available automation — for example, utilities that prompt for, and then manage, routine back-ups.

It is essential that the standards are relevant to the type of application being developed. Laying down the law on non-critical areas alienates users from the systems department, and brings the concept of standards into disrepute. A lack of standards in critical areas results in inefficiency and increases the risk of potential disasters. Figure 7 shows an example of such an approach to standards. Applications are assigned to one of three classes (A, B, or C), primarily according to the degree of risk involved — in other words, according to the impact that the application could have on other users, on the integrity of corporate data, and on security. For example, a spreadsheet for evaluating the financial forecasts of a potential acquisition target will need more stringent controls than one for monitoring expenditure against a departmental budget.

The approximate development cost, the technical difficulty, and the extent of continuing support needed also influence the category to which an application is assigned, and hence, the standards that will be followed. For example,

it is necessary to perform a cost/benefit analysis for a Class C application, whereas authorisation for a Class A application will usually be given on the strength of a written recommendation from a manager. Users creating Class B or Class C applications should be encouraged to obtain the seal of approval from the systems department, confirming that their application meets standards, particularly in terms of back-up and security routines.

Identifying business opportunities

While it is important for information centre staff to improve their knowledge of their customers' business, information centre staff should not be expected to acquire the old systems department hat of business or systems analysis. The role of the information centre should be to encourage users in business departments to identify potential applications, and to develop them.

For example, at Dylex, a large Canadian retailer, a regional manager made a request for laptop computers, which he thought would be of great benefit to his sales people. The manager of the

Figure 7 It is essential that standards are relevant to the type of application being developed

	Data attributes	Application attributes	Project attributes	Associated standard
Class A (simple spreadsheet or database query)	<ul style="list-style-type: none"> Personal Non-strategic Low-volume Independent 	<ul style="list-style-type: none"> Personal Standalone Low complexity 	<ul style="list-style-type: none"> One to five workdays No formal project management warranted 	<ul style="list-style-type: none"> Obtain authorisation Use password Back up data Use common sense Document as appropriate Label the application and output reports
Class B (spreadsheet used on regular basis or database reporting program used by more than one person)	<ul style="list-style-type: none"> Departmental High-volume Used by other programs 	<ul style="list-style-type: none"> Corporate Used by more than one person 	<ul style="list-style-type: none"> Six to 20 workdays Some project approval/project management warranted 	Class A standards + <ul style="list-style-type: none"> Do recommended control analysis Document Get 'seal of approval' for system security and so on
Class C (micro-based DBMS application, or complex spreadsheet, or simple spreadsheet used for critical decision-support)	<ul style="list-style-type: none"> Strategic or sensitive Used to update corporate database 	<ul style="list-style-type: none"> Complex Uses non-recommended technology 	<ul style="list-style-type: none"> 21 to 40 workdays Formal project approval/project management warranted More than 40 days — system development standards apply 	Class B standards + <ul style="list-style-type: none"> Do compulsory control analysis Do feasibility and cost-benefit analysis Get agreement from development department

(Source: Based on an example from the Software Management Institute)

information centre assembled a cross-functional team, consisting of a corporate telecommunications specialist, a systems analyst, a representative of the general manager, and a member of the staff of the information centre to investigate the possibilities. At Motorists Insurance Companies, an insurance firm in Ohio in the United States, the information centre has created some short video presentations to help users identify products that might be of benefit to them. One explains electronic spreadsheets and the instances in which they are most useful. Another aims to encourage managers and professionals to try computing, and contains testimonials from other executives in the organisation who use computers. Other organisations have set up technology showcases, newsletters, and workshops to make users aware of the possibilities of computing.

Routine maintenance

Routine maintenance of desktop hardware, and installation of upgrades for standard software packages are costly areas of support for the information centre. The task of routine maintenance will never be eliminated, but with careful management, it can be substantially reduced. User education can contribute; so can the use of automated utilities. A third approach is to transfer part of the onus to small local suppliers. Given the lower overheads of such a supplier, it may well be more cost-effective to pay him to install a new package rather than to get the information centre staff or the users to do it themselves.

In summary

In summary, the primary purpose of the information centre in the 1990s will remain unchanged — the promotion of the technologies and applications of end-user computing. However, end-user computing in the early 1990s will

be quite different from what it has been during the 1980s. Straightforward applications, such as spreadsheets and word processing, must increasingly be viewed as commodity functions, no more complex to install and maintain than a facsimile machine, a photocopier, or a telephone, but new applications, of a more sophisticated nature will emerge.

The information centre must therefore change its style of operation in three major ways. First, with regard to commodity applications, it must take positive steps towards helping users to help themselves, and not merely pay lip service to that concept. Second, it must focus on encouraging the adoption of new and more sophisticated forms of end-user computing, ranging from fourth-generation languages to desktop publishing and user-developed rule-based systems. Third, it must make renewed efforts to break down the barriers between users and systems departments, so that systems developed by users can work with mainframe systems developed by professional development staff.

The information centre that continues to base its strategy on the end-user computing of the 1980s will soon become as outmoded and counter-productive as the data processing departments that failed to accommodate the benefits offered by minicomputers and PCs. End-user computing is arguably the most significant development in the history of information technology. Inevitably, the distinction between personal computers/workstations and large systems is now becoming blurred, and that is a good thing. Even so, end-user computing has far more unexplored potential. Unless information centres embrace and encourage these new developments, the systems department may well lose much of its influence by the turn of the century.

The Butler Cox Foundation

The Butler Cox Foundation is a service for senior managers responsible for information management in major enterprises. It provides insight and guidance to help them to manage information systems and technology more effectively for the benefit of their organisations.

The Foundation carries out a programme of syndicated research that focuses on the business implications of information systems, and on the management of the information systems function, rather than on the technology itself. It distributes a range of publications to its members that includes Research Reports, Management Summaries, Directors' Briefings, and Position Papers. It also arranges events at which members can meet and exchange views, such as conferences, management briefings, research reviews, study tours, and specialist forums.

Membership of the Foundation

The Foundation is the world's leading programme of its type. The majority of subscribers are large organisations seeking to exploit to the full the most recent developments in information technology. The membership is international, with more than 400 organisations from over 20 countries, drawn from all sectors of commerce, industry, and government. This gives the Foundation a unique capability to identify and communicate 'best practice' between industry sectors, between countries, and between IT suppliers and users.

Benefits of membership

The list of members establishes the Foundation as the largest and most prestigious 'club' for systems managers anywhere in the world. Members have commented on the following benefits:

- The publications are terse, thought-provoking, informative, and easy to read. They deliver a lot of message in a minimum of precious reading time.
- The events combine access to the world's leading thinkers and practitioners with the opportunity to meet and exchange views with professional counterparts from different industries and countries.
- The Foundation represents a network of systems practitioners, with the power to connect individuals with common concerns.

Combined with the manager's own creativity and business knowledge, Foundation membership contributes to managerial success.

Recent Research Reports

- 56 The Impact of Information Technology on Corporate Organisation Structure
- 57 Using System Development Methods
- 58 Senior Management IT Education
- 59 Electronic Data Interchange
- 60 Expert Systems in Business
- 61 Competitive-Edge Applications: Myths and Reality
- 62 Communications Infrastructure for Buildings
- 63 The Future of the Personal Workstation
- 64 Managing the Evolution of Corporate Databases
- 65 Network Management
- 66 Marketing the Systems Department
- 67 Computer-Aided Software Engineering (CASE)
- 68 Mobile Communications
- 69 Software Strategy
- 70 Electronic Document Management
- 71 Staffing the Systems Function
- 72 Managing Multivendor Environments
- 73 Emerging Technologies: Annual Review for Managers

Recent Position Papers and Directors' Briefings

- Information Technology and Realpolitik
- The Changing Information Industry: An Investment Banker's View
- A Progress Report on New Technologies
- Hypertext
- 1992: An Avoidable Crisis
- Managing Information Systems in a Decentralised Business
- Pan-European Communications: Threats and Opportunities

Forthcoming Research Reports

- The Future of System Development Tools
- Assessing the Value from IT
- Systems Security
- New Telecommunications Services
- Using IT to Transform the Business

Butler Cox

The Butler Cox Foundation is one of the services provided by the Butler Cox group. Butler Cox is an independent management consultancy and research company. It specialises in the application of information technology in industry, commerce, and government throughout Europe and the rest of the world. It offers a wide range of services to both users and suppliers of information technology. For more information about our services, please contact your nearest office at the address shown on the back cover.

Butler Cox plc
Butler Cox House, 12 Bloomsbury Square,
London WC1A 2LL, England
☎ (01) 831 0101, Telex 8813717 BUTCOX G
Fax (01) 831 6250

Belgium and the Netherlands
Butler Cox BV
Burg Hogguerstraat 791,
1064 EB Amsterdam, The Netherlands
☎ (020) 139955, Fax (020) 131157

France
Butler Cox SARL
Tour Akzo, 164 Rue Ambroise Croizat,
93204 St Denis-Cédex 1, France
☎ (1) 48.20.61.64, Télécopieur (1) 48.20.72.58

Germany (FR), Austria, and Switzerland
Butler Cox GmbH
Richard-Wagner-Str. 13, 8000 München 2, West Germany
☎ (089) 5 23 40 01, Fax (089) 5 23 35 15

Australia and New Zealand
Mr J Cooper
Butler Cox Foundation
Level 10, 70 Pitt Street, Sydney, NSW 2000, Australia
☎ (02) 223 6922, Fax (02) 223 6997

Finland
TT-Innovation Oy
Meritullinkatu 33, SF-00170 Helsinki, Finland
☎ (90) 135 1533, Fax (90) 135 2985

Ireland
SD Consulting
72 Merrion Square, Dublin 2, Ireland
☎ (01) 766088/762501, Telex 31077 EI,
Fax (01) 767945

Italy
RSO Futura Srl
Via Leopardi 1, 20123 Milano, Italy
☎ (02) 720 00 583, Fax (02) 806 800

Scandinavia
Butler Cox Foundation Scandinavia AB
Jungfrudansen 21, Box 4040, 171 04 Solna, Sweden
☎ (08) 730 03 00, Fax (08) 730 15 67

Spain and Portugal
T Network SA
Núñez Morgado 3-6ºb, 28036 Madrid, Spain
☎ (91) 733 9866, Fax (91) 733 9910