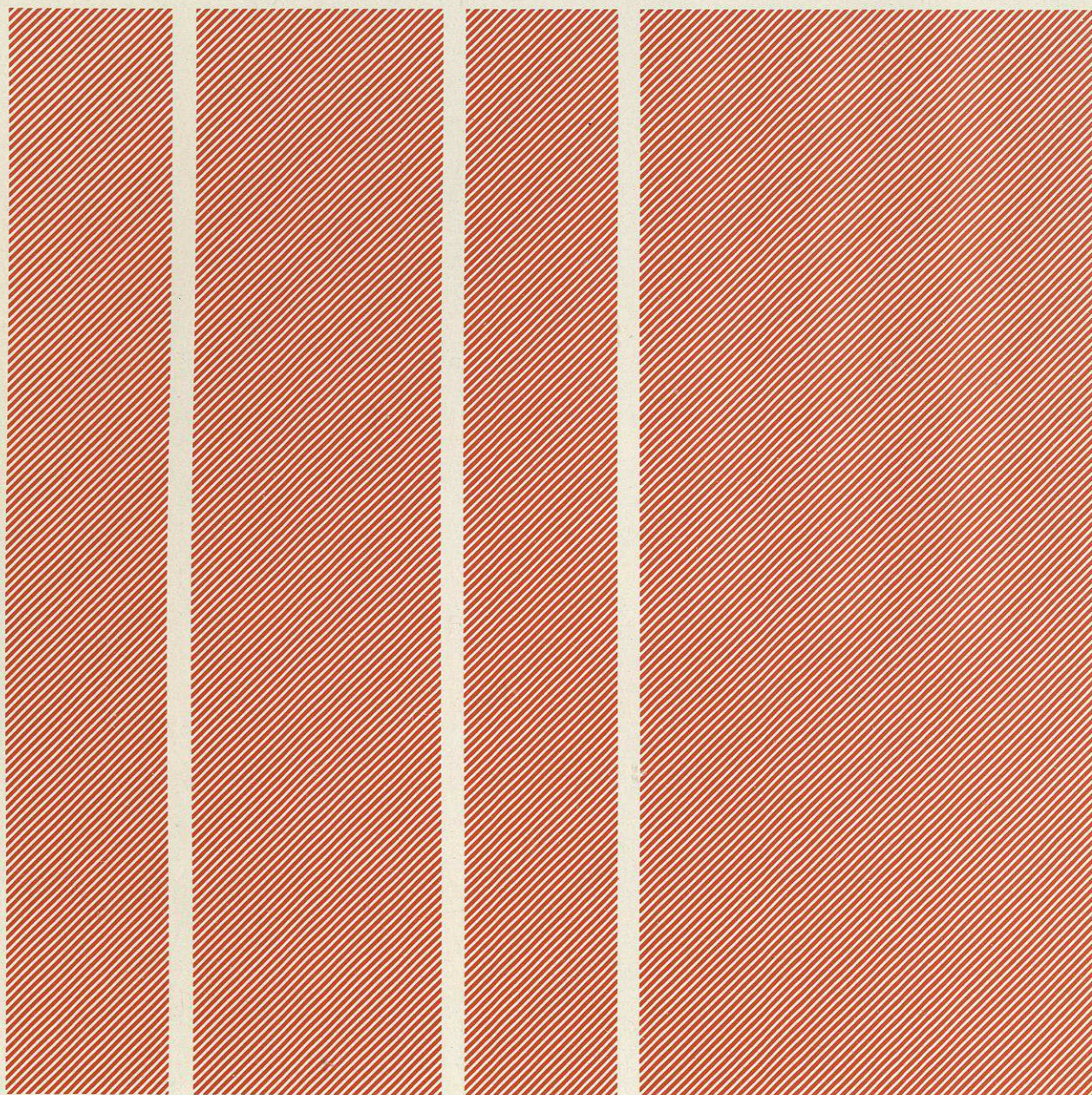Session
Summaries

International
Management Conference

IT issues for the
boardroom

Gleneagles
19-22 October 1985

The Butler Cox Foundation

THE BUTLER COX FOUNDATION

INTERNATIONAL MANAGEMENT CONFERENCE
GLENEAGLES, 19-22 OCTOBER 1985

IT ISSUES FOR THE BOARDROOM

Introduction

The annual international conference for members of the Butler Cox Foundation was held at the Gleneagles Hotel, Scotland between 19 and 22 October 1985. The conference focused on those aspects of information technology and information systems that are relevant to senior business managers. This document contains summaries of the presentations made at the conference.

The summaries were prepared by Butler Cox consultants during the conference and are intended as an aide-memoire. They are not a verbatim transcript, but present as faithfully as possible an interpretation of the main points made by each speaker. For the sake of brevity, some points have necessarily been condensed or omitted.

Where appropriate, the summaries include a selection of the visual aids used by the speakers.

We have also included a brief summary of the main points to emerge overall from the conference.

Introduction

La Conférence Internationale annuelle des Adhèrents à la Fondation BUTLER COX s'est tenue à l'hôtel Gleneagles, en Ecosse, du 19 au 22 octobre 1985. Le thème retenu pour cette manifestation était de traiter des aspects de la technologie de l'information plus particulièrement pertinents aux Dirigeant d'entreprise. Ce document présente l'ensemble des synthèses des interventions faites au cours de cette manifestation.

Ces synthèses ont été préparées par les Consultants de BUTLER COX au fur et à mesure du déroulement de la Conférence et ont pour objet de n'être qu'un aide-mémoire. Ce ne sont pas des compte-rendus au mot à mot mais ils représemtent aussi fidélement que possible les éléments principaux présentés par les Intervenants.

Une sélection des supports audio-visuels utilisés est également jointe à chaque texte partout où nécessaire.

Enfin, nous avons inclu dans ce compte-rendu une synthèse générale présentant les points principaux qui sont apparus au cours des sessions.

THE BUTLER COX FOUNDATION

INTERNATIONAL MANAGEMENT CONFERENCE
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IT ISSUES FOR THE BOARDROOM

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The theme of this conference was IT issues for the boardroom. Judged on the basis of the various presentations, a subsidiary theme might well have been "some tales of two cultures". Every speaker, in his own way, made a comparison between an existing or previous, and less-desirable, culture and an existing or planned, and more-desirable, culture.

The opening address on Sunday evening was given by Pieter Dankert. He represents the parliamentary focus within the European Common Market, being a member and previous President of the European Parliament in Strasbourg. He described Europe as still a collection of individual nations, with strong cultural and economic differences between the rich north and the poor south. In his view "Europe doesn't really exist". Because of this lack of unity he appealed for more-effective planning between national and European Government agencies, a stronger and more-cohesive domestic European market, a stable European currency and better-coordinated research and development.

The keynote address for the conference was given by David Butler, the Chairman of Butler Cox. He drew a picture of the world of strategic systems management divided into two pairs of hemispheres. He contrasted the western analytical hemisphere with the eastern political one, and the northern planning hemisphere with the southern implementation one. He claimed that the north-western quadrant was rich in established planning methods but the other three quadrants were relatively poor. Most systems people live in the artificial world of rational analysis decisions. They need a culture programme to introduce them to the Realpolitik of the commercial worlds of their parent organisations.

The second speaker on Monday morning was Edson D de Castro, President of Data General Corporation. He made the cultural contrast between the risk-taking organisations — "the innovators" — and the predestrian organisations — "late adopters and laggards". He described how a high-technology company such as Data General should concentrate its marketing on innovators and early adopters because their behaviour influences the subsequent behaviour of late adopters and laggards.

He went on to emphasise Data General's commitment to the Open Systems Interconnection (OSI) standards. He said that the largest users in North America are preserving their flexibility by insisting that vendors offer OSI compatibility. He said that Data General's policy was that their customers should link-out rather than be locked-in.

The next speaker was Dr Dan Isenberg of the Harvard Business School. He described the results of his research into the ways in which senior managers think. He contrasted the rational approach, which is described in text books and taught at business schools, with the much less rational, more opportunistic approach that managers actually practise. He then described a model of the management thinking process that he called "strategic opportunitism" and he drew conclusions about the characteristics of an effective executive support system.

The government agency focus on the European Common Market was provided by Dr Walter de Backer, Director of Informatics for the European Commission in Luxembourg. He contrasted the problems of computer users, locked-in to their existing suppliers and applications by the absence of standards, with the situation he is working to achieve through the development of European standards. In this sense he responded to the challenge set earlier by Pieter Dankert. He described the objectives of the European INSIS programme, the desired architecture for linking workstations, host computers, servers and communications networks, and the status of progress to date. He also mentioned the need for standards for human interworking.

On Monday afternoon, two speakers described practical approaches to the strategic application of IT. The first was Michael Cowley, from Eastman Kodak. He described the approach recently adopted by Kodak, at the instigation of top management, to improve the effectiveness of their systems planning. He emphasised the importance of people rather than procedures, the need to be driven by the business rather than by the technology and the importance of selling the resulting strategy to those affected by it.

He was followed by Anthony Bargioni of the Beecham Group. He contrasted the success factors one would generally find in a typical systems department with the business-oriented factors that are used in Beecham. He described two cases in which these factors had been addressed with great success. He summarised by saying that the systems function must

earn major stature within the organisation and that the best way to do this is to fit in with the organisation by matching the style of systems management with the culture of the business.

The first speaker on Tuesday morning was Roy Bright, previously the head of the Intelmatique programme in France. He contrasted the ways in which technologies such as videotex, electronic publishing and smart cards had failed in some applications but had succeeded very well in others. He stressed that the package of computers, terminals, software and telecommunications will only survive if it is tied together with the string of the market that it serves.

The final two speakers both described the ways in which the system service had been transformed in their companies. Bill Miller, of Kansas City Power & Light, spoke about the changes that had moved his company from a mainframe culture in 1979 to a PC culture in 1985. The role of the central systems department had changed completely and users are now responsible for their own system development.

Bill Cook described a similar revolution within Morgan Stanley in New York. In his case, the company had retained a central systems service but had completely changed its methods of working. He forecast that in his industry, in which information is the commodity that is traded, systems services will become the very core of the business. The challenge to systems strategy is to understand both the business and the technology so that fundamental business problems can be addressed.

Summing up the conference, David Butler clarified the challenge now facing those responsible for managing systems and IT. Are we willing and able, equipped technically, psychologically and physically, to act as the agents of change who will bring IT to the heart of our organisations?

EUROPE AND TECHNOLOGY: THE RESPONSE TO JAPAN AND THE US

Pieter Dankert, *Member of the European Parliament*

Pieter Dankert has been active in Dutch politics since the late 1950s. He was elected to the European Parliament in 1977 and served as President of the Parliament between 1982 and 1984.

Dr Dankert stressed the importance attached by the European Community to Information Technology (IT). But impediments to development and to the free flow of goods and services have made us recognise that "Europe doesn't really exist".

Europe is still a collection of quite separate nations. The Chairman of Philips had drawn up proposals for a unified market, to be created by 1990. The otherwise ill-starred Milan summit had endorsed a variant of this proposal targeted for 1992.

Europe is vexed by problems of economic disparity between the rich north and the poor south, problems which the accession of Spain and Portugal will make more acute. Newer and poorer members are demanding higher budgets. The older and richer members are reluctant to foot the bill. Thus, in 1986 the EEC will run a budget deficit of two billion dollars. Harmonisation is a discordant affair.

The decision-making machinery of the Community is now under review. Can the roadblocks to progress be removed, without endangering the sovereignty of the member nations? Proposals for "variable geometry" or "differentiation" envisage selective action by certain members.

International monetary stability — particularly between the dollar and the yen — would also be a serious step forward. The finance ministers and the Community have recently intervened to try to drive the dollar down.

Dr Dankert viewed with concern the closer association of American and Japanese enterprises. The threat of American protectionism has drawn Japanese companies into the US economy in growing numbers. American firms also seem to exploit centres of cheap production better than do their European counterparts.

To profit from the future, Europe needs not only to create its internal market but also needs to sustain sufficient growth to tackle social and economic problems. The OECD forecast of 2.5 per cent growth is inadequate to do so. Not even the the US economy is forecast to sustain acceptable growth. Hence certain European countries — Germany now, Britain and Holland soon — are being selected to reflate and lead the dash for growth.

Europe also needs a coordinated approach to research. Successful projects do exist. But most of Europe's research and development investment is still at a national level. Europe's markets are still 'Balkanised'.

Japanese and American industries benefit respectively from the effective planning of government agencies and world-scale indigenous markets.

Stronger internal markets, stable currencies through the EMS, and better coordinated research and development are Europe's only hope for the future.

L'Europe et la technologie — repondre aux defis americains et japonais

La session d'ouverture de la Conférence Internationale est faite par M. Piet DANKERT, Député au Parlement Européen et précédemment Président de ce même Parlement. Au cours de cette session, M. DANKERT présente les éléments politiques et économiques indispensqbles aux industries européennes pour pouvoir faire face avec suucês à la compétition américaine et japonaise.

INFORMATION TECHNOLOGY (IT) AND REALPOLITIK

David Butler, *Butler Cox & Partners Limited*

David Butler is Chairman of Butler Cox. He is also a director of Istel, Octagon Investment Management and IMI Seed Capital.

The term 'Realpolitik' (practical politics) was invented in 1850 to highlight the lack of realism in the policies pursued by German liberals during and after German unification. They lived and acted upon a set of principles or cultural values at odds with those of the real world. Many business managers would say that is an apt description of the attitude of their organisation's systems department.

How common is the cultural dissonance between the information systems function and its host organisation? Paul Strassmann recently addressed a group of Foundation members where he summarised the kinds of issues that typically preoccupy boards of directors. He asked how many of those present honestly felt qualified by training, experience or insight to deal authoritatively with such issues. Only three or four hands went up from the eighty or so people there, and there was a distinct feeling of unease in the room.

Many believe that the way out of this difficulty (ie the way to drag the systems function into the world of Realpolitik) is to align IT strategy with business strategy. Everyone agrees that an IT strategy is either desirable or essential. So why is it, that in many (perhaps most) companies, an IT strategy is very hard to define and agree? Why is it that in many companies, an IT strategy even when agreed, may be very hard to implement? Why is it that in many companies, an agreed and implemented strategy may have so little discernible impact on the company, its systems, and its business performance?

Limitations of existing systems planning methods

Systems planning methods (such as Business Systems Planning, Critical Success Factors and the User Needs Survey) have been available for several years. These tools are usable and useful, but they are incomplete. As answers to the overall need for an IT strategy, they are necessary but not sufficient. David Butler's thesis was that there is a further, crucial and underestimated dimension to a systems strategy: the dimension of Realpolitik.

There is a growing recognition that the political side of systems is an important concern. Later in the conference Anthony Bargioni of the Beecham Group gave a talk that David regards as a case study in the astute political management of the systems function. In a recent edition of *Datamation* there were two articles on the political side of systems management, entitled "Information Politics" and "Power and Credibility in Office Automation". Though neither offers any specially valuable insight, their airing of the topic is timely enough.

During the past few months, Butler Cox has been conducting the research for Foundation Report No. 49, entitled "Developing and Implementing a Systems Strategy". Butler Cox believes that this report will prove of great significance to Foundation members, and may necessitate a fundamental reappraisal of the way the information systems director does his job.

The research, and the experiences of the large companies examined, supported the view that the use of tools such as BSP, CSF and UNS provides useful benefits, often in the form of better medium-term technical plans and an improved working relationship with management. Nevertheless the evidence is overwhelming that, at the genuinely strategic level,

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Technologie de l'information et 'Realpolitik'

Si la technologie de l'information commence à être perçue par certaines entreprises comme une arme déterminante dans l'arsenal des moyens de compétition et de concurrence, elle reste quand même, paradoxalement, en dehors du raisonnement instinctif et culturel de la plupart des entreprises. David BUTLER, Président de la BUTLER COX, présente le résultat de ses réflexions à ce sujet et propose un plan d'action, intéressant à la fois Directions Générales et Dirigeamnts Informatiques, pour apporter une solution à cette situation.

planning is still regarded as difficult. Judged by the triple standards of top management involvement, successful implementation and effective change secured, the performance is at best marginal.

Report No. 49 addresses the problems of effective systems planning and implementation. Specifically, it describes a new approach to strategic systems planning, based on the work of behavioural scientists, which takes full account of the social, political and human aspects of the problem.

The first set of problems is concerned with definitions. What is the meaning of the concept 'strategy'? What elements does it include? How do you know when you've got one? How do you implement it, without first turning it into something else? A previous Foundation report described a strategic systems plan as "a plan which defines IS objectives in terms of benefits to the organisation, and provides a list of specific guidelines within which systems development may take place''. With the benefit of hindsight, this definition is now seen to be inadequate because it confuses the planning process (the how) and the plan (the what). It mistakes the process for the product — a typically linear, deterministic muddle for a systems planner to get into.

Strategy is at root an abstract concept. Once it moves into the world of Realpolitik, it manifests itself as tactical action plans. Strategy defines the direction of, and the limits to, tactical plans and actions. But strategy alone is not sufficient: in the world of Realpolitik, tactical effectiveness is also necessary. Here we look the problems of definition right in the eye. Strategy is to do with getting people to identify with key objectives and to move together in the right direction. It is a social and behavioural activity, rather than an analytical one. Therefore it is perceived as 'soft' rather than 'hard' and consequently more difficult to define or describe.

If the strategic IT plan is to be worth the paper it's written on, top management enthusiasm is a must. Yet information systems directors almost unfailingly present their findings and recommendations to the Board in a way that behavioural scientists tell us quite clearly is guaranteed to provoke suppressed hostility.

All of the conventional systems planning tools pay very little attention to the problems of implementation — how to convert their prescriptive formulae to the world of Realpolitik. There are at least four major obstacles to successful implementation of an IT strategy. The first is what behaviourists call 'social inertia', the tendency of all organisations to absorb and dampen the intended effects of change. The more complex an organisation, the more social inertia it will manifest.

The second obstacle is the modification of objectives. Academic research has shown that people in goal-seeking organisations are perfectly happy to modify objectives during implementation of a plan. In particular, a systems plan conceived strategically at Board level will be implemented tactically at departmental manager level, and at operational level by system users. The plan, as implemented, may have consequences quite different from those intended.

Third, people perceive information as a proprietary source of power. Impending change is seen either as a threat or as an opportunity for self-aggrandisement.

Fourth, different groups may view plans from the basis of different value systems. The most obvious contrast is between the value-set that prizes efficiency, effectiveness and profit, and that which prizes job satisfaction, personal choice and self-expression.

Thus, the systems planner, equipped with tools that are linear, deterministic and analytic, applies them in a world that is largely non-linear, probabilistic and synthetic. He (or she) constructs with these tools an abstraction called a systems strategy plan based on a worldview that is quite at odds with the worldview of those who must authorise it, implement it and fund it. It contains elements guaranteed by behavioural research to trigger reactions of repressed hostility.

A new framework for strategic systems planning

Foundation Report No. 49 advocates a new framework within which to consider these problems. The whole domain of strategic information management can be represented as a circle divided into four sectors (see Figure 1). The northern hemisphere is concerned with planning, the southern with implementation. The western hemisphere is concerned with analytical activities, the eastern with social activities. In terms of how good we are at these tasks, the order is probably NW, SW, NE, SE. It goes without

Figure 1

THE DOMAIN OF STRATEGIC INFORMATION MANAGEMENT

Analytical | Political

Planning
Implementation
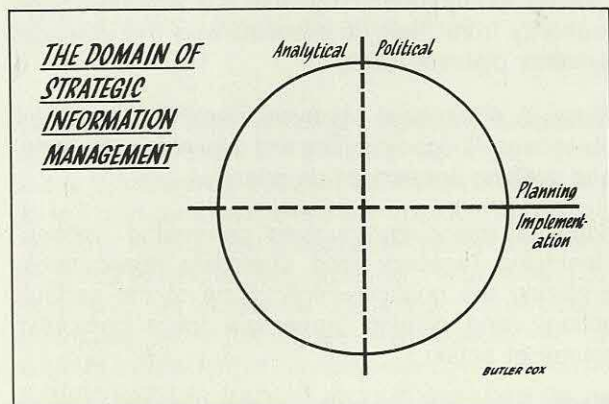
BUTLER COX

saying that nearly all of the existing methodologies inhabit the western hemisphere.

Butler Cox has overlaid this simple model with the outcome of psychological research that originally produced a theory of how organisational change occurs. (The social and human processes were described as unfreezing, moving and refreezing.) Later, two more social psychologists, called Kolb and Frohman, took this theory and tried to build a model of the process of change as brought about in a management consultancy project.

The Kolb/Frohman model is concerned not with techniques or methodologies, it has no checklists or forms. It is concerned with the establishment and development of a relationship between two people — a consultant and a client. The model proposes seven stages in the consulting assignment — scouting, entry, diagnosis, planning, action, evaluation and termination. These may overlap, they may occur sequentially or simultaneously, and there can be feedback from later to earlier stages. But each of the stages involves different types of activity and each leads to different outcomes.

Later still, the model was transferred from the consultancy process to the process of developing and implementing an information system, where it was found to be particularly applicable in the case of large complex projects. This suggested that the Kolb/Frohman model should also be applicable to the strategic systems planning process. Butler Cox has therefore redefined the seven stages of the Kolb/Frohman model in strategic systems planning terms, as follows:

Stage 1 (scouting) involves making contact with top management, opening channels of communication, building confidence and credibility, raising awareness of common concerns and opportunities, and creating an opportunity for entry to the following stages of strategic systems planning.

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

Stage 3 (diagnosis) involves identifying business objectives, IT opportunities and available resources, and seeking agreement on priorities.

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

Stage 5 (action) involves converting the agreed strategic direction into tactical goals, with resources and responsibilities clearly allocated, and removing resistance to change.

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

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

Figure 2 shows how the seven stages of the Kolb/Frohman model map onto the total domain of strategic systems planning.

Butler Cox believes the model is a useful means of helping to realign information systems thinking. In particular, the model shows clearly that the most crucial activities are in the social and political area. The implication is that systems directors must strive to become skilled operators at Realpolitik in their organisations.

In conclusion, David said that he would certainly propose that every company should arrange a 'corporate culture' programme for the systems director and his senior colleagues. Elements of internal and external finance would be covered. Who are our shareholders? What changes their view of our shares? What are the sensitive areas of our balance sheet? Who are our directors? What is their background? Did you know that the Chairman's wife runs a charity? Can we do anything to help her? Did you know that one of our non-executive directors is also on the Board at IBM. Can he do anything to help us?

Systems directors must preserve their excellence in linear, analytical, deterministic techniques. But they must also improve their ability to deal in Realpolitik.

Figure 2

KOLB/FROHMAN MODEL MAPPED ONTO THE DOMAIN OF STRATEGIC INFORMATION MANAGEMENT
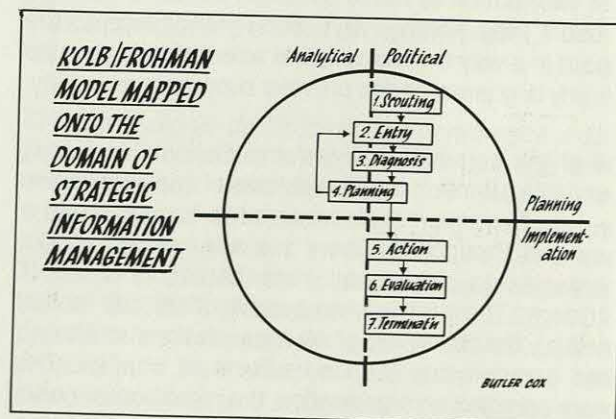
USER IT STRATEGIES: A SUPPLIER'S VIEW

Edson D de Castro, *President, Data General Corporation*

Ed de Castro was a founder of Data General in 1968 and has been president since that time.

Senior managers responsible for planning future information systems tell us that their long-range plans are shrinking from five years down to three years. And even their three-year plans are being updated and changed on a yearly basis. In fact, most companies are not where they thought they would be five years ago.

By 1990, companies will need to respond instantly to change, and this means that, instantly, they will need to get a complete and accurate picture of what is happening. These trends are forcing organisations to look in a new way at how they manage information.

General market environment

Many of Data General's marketing strategies are based on the early-adopter theory (summarised in Figure 1). Innovators are defined as the first 2.5 per cent to adopt new technology, early adopters are the next 13.5 per cent, late adopters are the next 68 per cent, and laggards are the next 16 per cent. Late adopters form the mature and major market for new products, and they are influenced by the actions of innovators and early adopters.

In order to better understand the current behaviour of innovators and early adopters, we can review the most apparent historical trends. In the 1960s, a few innovative companies installed mainframes to computerise the enormous task of record keeping. In the 1970s, the innovators installed minicompters, mainly for use by scientists and engineers. But they soon began to outgrow these systems, and vendors responded with ever more powerful systems. Yet, once again, leading-edge users found ways to circumvent the deficiencies of the large mini.

An alternative for many users emerged in the form of micro-based, relatively low-cost, single-user systems. Yet, from management's point of view these dedicated processors actually represented a step backwards because they disconnected individuals from shared resources. This problem was addressed by the local area network.

Figure 1

The Market Adoption Sequence

As a consequence of these trends most companies now have mixed computers from various suppliers. And they now want to tie them together in a company-wide system. Data General calls such a system "Time" (Total information management environment). As defined by Data General, Time is the logical integration of the 'office of the future' and the 'factory of the future'.

Market attitudes

Less than a year ago, Data General made a study to uncover the factors that hold up the purchasing

Les strategies informatiques des utilisateurs: point de vue d'un constructeur

Quels sont les éléments de stratégie informatique qui devraient intéresser une Direction Générale ? Quelle est la structure de décision de l' entreprise la plus apte à bien comprendre et à bien exploiter le potentiel de cette technologie à évolution rapide? Comment organiser la fonction des systèmes d'information pour optimiser informatique centrale, informatique distribuée et informatique individuelle? M. de CASTRO, Président et Fondateur de DATA GENERAL CORPORATION, traite et apporte son point de vue à toutes ces questions.

Figure 2

European Resistance

- Lack in high-speed telecommunications
- Lack in total solutions
- Few discretionary funds
- User needs vs. user wants
- Norms and standards
- User confusion
- Executive resistance

Source: Dataquest
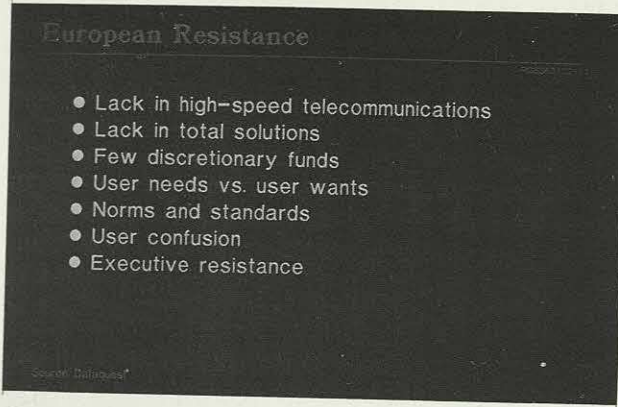
process for integrated office systems. The following attitudes were recorded:

—Early adopters' chief concern was the provision of micro-to-host connections and the establishment of office networks.

—Late adopters were looking for compatibility.

—Most laggards were primarily concerned with cost considerations and were afraid of making expensive mistakes.

Moreover, another survey identified several reasons for resistance to office automation in Europe. (The results of this study are summarised in Figure 2.)

Data General tries to understand what its more innovative customers want. The innovators believe that the next revolution in productivity will result from the total integration of all computer systems, embracing all aspects of the business from marketing and finance to engineering and manufacturing.

Figure 3

Open Systems Architecture
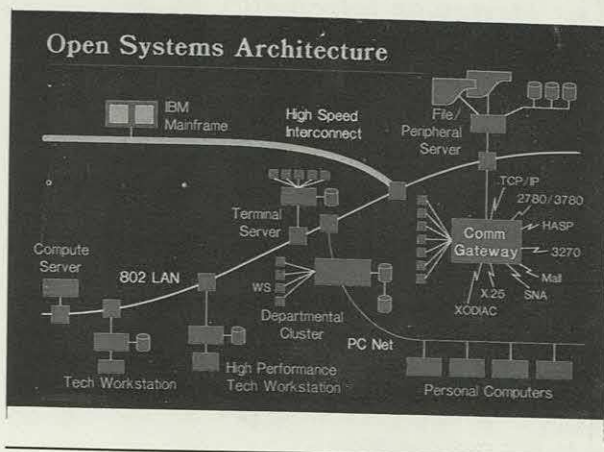
Data General's strategy

A total information management environment requires the combination of three elements: communications, an integrated work environment and flexible hardware systems. A complete communications capability should enable independent systems and workstations to be linked with equipment from other vendors, thereby protecting and maximising an organisation's prior investments.

Another key element is an integrated work environment which begins with an easy-to-use, consistent interface between the user and the system — from software package to software package, and from system to system.

The final element of a total information management environment involves powerful, flexible, compatible hardware systems, able to run the integrated software capabilities just described.

Depending on an organisation's total information management plan, its systems could include countless combinations of personal, departmental and corporate systems. Data General has based the network that ties all these resources together on the International Standards Organisation's seven-layer model for Open System Interconnection. This means that the network can also incorporate nodes that have not even been heard of yet without having to redesign the whole system's context from scratch (see Figure 3).

Data General believes that the pent-up demand for vendor-independence will come to a head in this decade. When it does, suppliers in every sector of the industry will have to decide whether to throw up barricades and defend proprietary architectures, or to accommodate new information technologies in an open systems architecture. Data General has already made that decision. It plans to continue to win busines by providing advanced technology, not by locking-in its customers.

In simple terms, the strategy is to maintain price/performance leadership across a broad range of compatible systems while accommodating new operating systems, communications standards and software solutions as they emerge (see Figure 4).

Large user organisations in the United States (General Motors, Boeing, Westinghouse, General Electric, etc.) have made it clear that vendors bidding for their future business must eventually supply information systems that can communicate with other vendors' equipment.

Figure 4

Data General's Strategy

Case histories

One of the best examples of the benefits of an integrated systems approach is Tetra Pak, the world's largest manufacturer of packaging materials for liquid foods. In 1976, the first Tetra Pak plants were built outside Sweden and the company needed to find a data processing solution for each plant. This solution had to manage the manufacturing, order processing, inventory control, invoicing, accounting and planning activities at the plants. The integrated approach adopted in 1979 is based on Data General equipment, ranging from Desktop systems to MV/10000 super minicomputers.

At the end of 1981, Tetra Pak decided to implement Data General's CEO integrated office automation system. During the pilot phase two departments were equipped: worldwide production planning; and financial control. In 1983, 80 of the 110 employees in these departments had access to the CEO network.

Another example is provided by the Departmental Government of Rhône in south-east France, who wanted to computerise the repetitive tasks that employees had to handle. Computerisation meant ending the traditional way in which new tasks had been handled. When there were new tasks to be done, new employees were hired, instead of improving the work performance of existing employees.

The objective of the Departmental Government was to install easy-to-use computer tools for analysing the massive amounts of data involved in this type of administration. The departmental government installed the CEO integrated office automation system, and is now using all the different facilities of CEO to help save time and improve productivity.

Here in Scotland, the Bank of Scotland claims to offer one of the fastest home-loan services as a result of a credit assessment software package developed by

Data General's systems division and integrated with the CEO system.

Grand Metropolitan, one of the ten largest companies in Britain, is using Data General systems in a nationwide distributed information network based on an IBM mainframe.

Crown Agents, which provides management, commercial and financial services to public bodies in more than 100 developing countries is replacing its mainframe with a network of Data General's family of computers to handle a variety of applications.

NOS, The Netherlands Broadcasting System, is using MV/4000 computers and CEO software to handle all the administration of television and radio services supplied to regional users.

Cassa di Risparmio de Modena, a leading Italian bank, has also automated its offices with CEO.

Conclusion

Last November, *The Economist* diagnosed the constraints on innovation in Europe in these terms: "Europe often looks for safety first. But this natural caution may prove suicidal now that the world is in the midst of a deep technological and economic change."

While Euro-pessimism is a fashion that comes and goes, today's fears centre on Europe's lag in applying new technology. The depressing picture painted in Figure 5 shows a worsening European trade balance in every line of electronics.

Europe's worst response to its predicament would be to resist change by protecting itself from it. One recommendation can be made: encourage the most innovative divisions, departments or workgroups in your organisation to set up pilot information management projects. These pilots can provide valuable feedback and new ideas for the next round of innovation.

Figure 5

The Chips Are Down
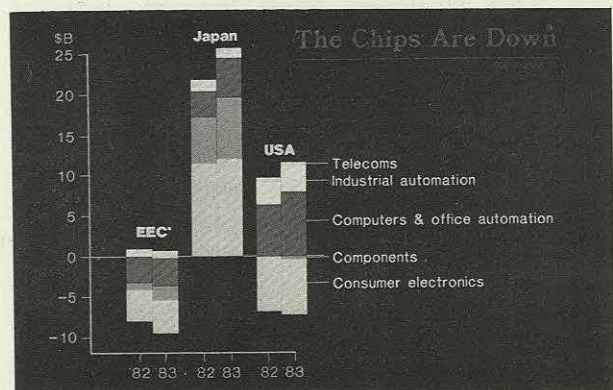
HOW SENIOR MANAGERS THINK: DESIGNING EXECUTIVE SUPPORT SYSTEMS

Daniel J Isenberg, *Harvard University*

Daniel J Isenberg is Assistant Professor of Business Administration at the Harvard Graduate School of Business Administration. He has researched the thought processes that underlie effective managerial behaviour.

The management decision-making process

Daniel Isenberg pointed out that we often adopt a far too simplistic approach to the management decision-making process and hence design our information systems on quite the wrong basis. In practice, the process is very complex and a new perspective is needed. This view stemmed from a four-year study of a selected group of company presidents. The purpose of Dr Isenberg's talk was therefore to help inform computer professionals so they might design systems that truly supported executive effectiveness.

All managers face a basic dilemma. How do you reconcile long-term considerations with the demands of today's burning issues? That is a dilemma that the systems designer needs to recognise and that he needs to help the manager address. So, Dr Isenberg posed two fundamental questions. Can the designers, consumers, and brokers of various kinds of information technology help managers build a better bridge between the pressing, immediate operational concensus of the moment, and the absolutely essential need to achieve longer-term strategic goals, the attainment of which can only be measured in months and years?

And secondly, can these bridges be designed and built while supporing rather than savaging the ecology of management and organisation, with minimal risk to the manager's natural mental habitat?

The whole thrust of the ensuing presentation was towards what Dr Isenberg termed 'strategic opportunism', a model for integrating strategic and opportunistic thinking within the senior manager's natural environment.

Rational decision making or intuitive decision making?

The basic model that we have hitherto used for the management process is a very rational one:

—Clarify the company's mission/purpose.

—Set goals.

—Specify objectives.

—Formulate strategies.

—Derive plans.

—Implement actions.

—Perform the above in linear progression.

—Perform the above while suspending evaluative judgment.

—Perform the above for one problem at a time.

And we have tackled this process on an equally rational basis:

—Base analysis on reason and data.

—Base goal formulation on analysis.

—Base objectives on goals.

—Base solutions on objectives.

—Choose solutions based upon SEUs.

But is that really the way things work in practice? In real life the typical management situation is full of uncertainties that militate against the purely rational

Construire des systemes d'information pour les dirigeants d'entreprise

Le Professeur Daniel ISENBERG enseigne à l'université de HARVARD où il se spécialise dans l'étude des Sciences Humaines appliquées à l'entreprise. Il est également l'auteur d'un récent mémoire paru dans le Harvard Business Review intitulé "Comment pensent les cadres supérieurs". Il présente, au cours de sa conférence, certaines des conclusions auxquelles il est parvenu au travers des recherches qu'il a mené dans l'analyse des processus de raisonnememt et de comportement des Dirigeants Supérieurs d'entreprises. Il en déduit les caractéristiques principales que doivent présenter les systèmes d'information construits à l'intention de ces Dirigeants.

approach. These uncertainties embrace political, technological, financial and organisational issues. They give rise to problems that are ill-structured, and it is the ill-structured problems that cannot be pushed down the line and that cannot be systematised. Such problems have the following symptoms:

—'Experts' disagree on the definition of the problem.

—Problem symptoms shift.

—There are multiple, interrelated symptoms.

—There is imprecise, unreliable information about the symptoms.

The problem causes are also often uncertain and ill-structured because: there are multiple causes; causes are interrelated; there are imperfect cause-effect relations; and causes are unique.

Moreover, part of the process of management concerns goals, and often the goals themselves are far from clear. There can be multiple goals and there can be conflicting goals with inherent trade-offs. Then again, even if the manager understands the problem and has clearly specified his goals, the properties of a good solution may not be clear. The solutions may involve multiple paths. The solution may not even be identifiable.

In addition the links between solution and cause may not be clear because: the attempted solutions change causes; and there may be ambiguous or imprecise (long-term) feedback. Such is the normal real-life management-decision situation.

So, how do managers handle such complex and ill-structured situations? Dr Isenberg's research has aimed to answer this question by observing senior managers, asking them what they were thinking at various moments in time and probing them to introspect. One of his basic findings was that intuition was not an alternative to sustained rational analysis — it was simply different. Managers used the two in combination. Senior managers relied heavily on intuition for sensing problems, synthesising data, checking sustained analysis, action planning, and rapidly performing routine 'programmes'.

He also concluded that senior managers rarely make substantive decisions.

The concept of problem management

One difficulty with the concept of 'decision-making' is that, in practice, managers are not faced with isolated choices. They have a portfolio of problems, issues and opportunities in which:

—Many problems and issues exist simultaneously.

—These problems and issues compete for some part of the manager's immediate attention.

—The issues are interrelated.

Dan Isenberg suggested the use of the term 'problem management' (as an alternative to either decision-making or problem-solving) to describe the situation. It helped convey the message that problems or issues are often not solved in any definitive way. Rather, the manager has a 'problem network' that he manages in order to allow him to make appropriate moves as opportunities arise.

The thinking-acting cycle

Another point that needs to be appreciated is the relationship between thinking (or planning) and acting. On the one hand you get the view that managers should plan in great detail before they act; on the other you get the view that in reality management action has to take place at breakneck pace with little time to ponder, plan or reflect. Both of these views are wrong.

In practice, thinking and acting form a cycle where each is dependent on the other. Senior managers have to be prepared, and able, to think and act in rapid succession. They have to be willing and able to form tentative conclusions and act with minimal data. And they have to be prepared to use action to complete their understanding.

Dr Isenberg was keen to stress that he was not advocating a 'fire-aim-ready' mentality. Rather he was pointing out that as time and circumstances did not allow a textbook 'ready-aim-fire' process, what was really needed was a cycle of 'firing-aiming-firing-aiming', and so on.

Further results of the research

Turning to some of the quantified results of his research, Dr Isenberg presented a summary of what he found occupied senior managers' minds (see Figure 1).

Figure 1   Thought sample profiles
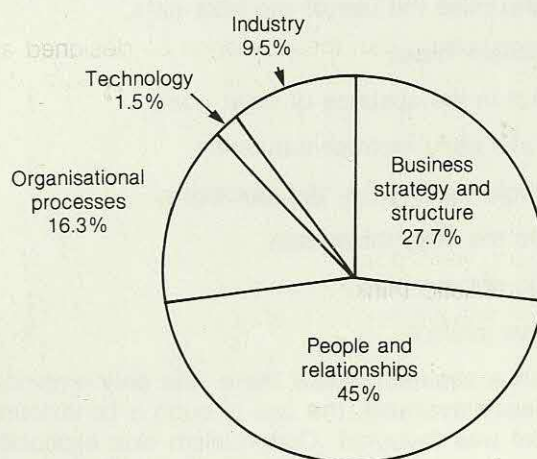
Figure 2   Thought sample profiles

Empathises 6.1%

Goals 6.5%

Speculates 16.2%

Evaluates 19.6%

Reasons 32.9%

Plans action 6.4%

Rule of thumb 6.0%

Surprise 6.6%
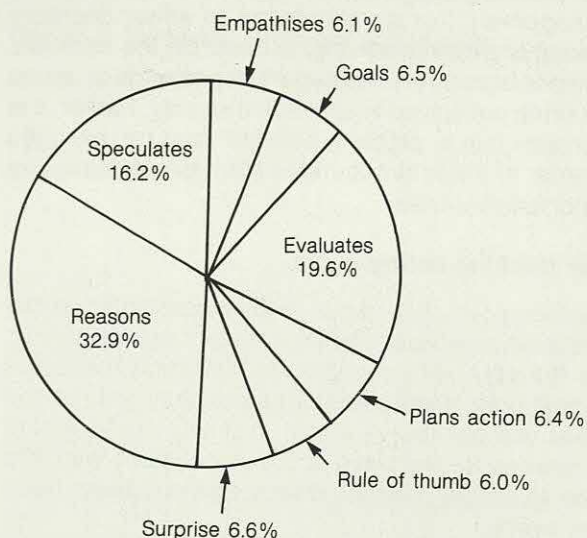
One further result was that managers think 'online' about individual people in great depth but they think about business or technical issues 'offline'. Another way of analysing the results was to measure how much time managers spent thinking about different topics (see Figure 2).

Dr Isenberg also found that senior managers interpret wildly from specific details. In other words, they based the interpretation less on the facts of the case than on the facts in their head, and they did not suspend judgement waiting for such data. They were 'flexibly evaluative'.

The opportunistic model

Based on these observations, Dan Isenberg said you could create an 'opportunistic model' that embraced the following guidelines:

—Maximise the use of available data.

—Collect ideas.

—Act in the absence of clear goals.

—Take early incremental action.

—Avoid making the 'big' decisions.

—Do the easy things now.

—Do not overplan.

—Use intuition.

Given a situation where there was only empirical evidence available, the use of such a behavioural model was favoured. Opportunism was especially well suited to ill-structured situations, with an abundance of problems, people, solutions and goals, and

with information to link them to one another. However, there are liabilities and limits to the opportunistic model — as there are for the rational model. There are obvious problems for the manager who only uses the available data and who never needs more, who never questions inferences, and always follows his hunches or pursues immediately apparent business opportunities.

Figure 3 summarises the strengths and weaknesses of the rational and opportunistic approaches.

Strategic opportunities

'Strategic opportunism' was Dr Isenberg's attempt to develop a normative stance vis-à-vis management thinking, in a way that capitalises on the advantages and reduces the disadvantages of either the rational or opportunistic models. The term was an umbrella one, used to embrace attitudes, skills, actions and cognitive processes.

Perhaps the term is best described by the metaphor of a senior manager likening himself to a beach-comber, examining the spoils of high tide, deciding whether to pick up a piece of flotsam, leave it, or throw it back to be examined another day.

Or is it the chief executive officer likening himself to the frog on the lily pad, waiting for flies to buzz by, but choosing his vantage point very carefully, and even shaping the swamp to attract and stimulate the healthiest, juiciest, and slowest flies.

The concept of strategic opportunism can be presented as a series of prescriptions:

—Develop an image of where you are going.

—Summarise frequently.

—Learn through reflecting on experience.

—Discover your goals.

—Work the ladder of abstraction.

Figure 3   Strengths and weaknesses of the rational and opportunistic approaches

	Rational approach	Opportunistic approach
Strengths	• Single-minded • Easy to monitor	• Flexible • Uses data • Intuitive
Weaknesses	• Presumes knowledge • Requires clear goals • Bypasses opportunities	• Redundant • Inefficient • Blind alleys

—Design gaps into your plans.

—Develop an attitude of prepared spontaneity.

—Reframe problems as opportunities.

—Combine problems and issues.

Strategic opportunism requires a cycle of intellectual intensity, constant learning, questioning, experimenting, reflecting, planning and retesting (see Figure 4). What is important about this cycle is not the order

Figure 4   Strategic opportunism cycle

in which the bases are touched, but the fact that eventually, all bases are touched.

The relationship with executive support systems

Because strategic opportunism is an attempt to integrate rational and intuitive approaches to management problems, and because it incorporates empirical data, it poses some interesting questions for the design of an effective executive support system (ESS):

—Does the ESS facilitate the formation of a rich associative, mental network?

—Does the ESS help the user relate general goal statements and specific actions in both directions?

—Does the ESS allow for goal discovery as plans are implemented?

—Does the ESS allow for replanning in mid-course?

—Does the ESS bind the individual yet allow the bonds to be broken?

—Does the ESS help the user organise his or her information — ie does it chunk or package bits of information so that the pieces are more easily recalled online?

In summary, Dr Isenberg concluded that the unique contribution of information technology to-date had been to support better rational decision making. What was now required was to introduce and to integrate the opportunistic element.

INTERNATIONAL STANDARDS AS A KEY ELEMENT OF LONG-TERM STRATEGY

Walter de Backer, *Commission of the European Communities*

Dr de Backer is Director of Informatics in the Commission of the European Communities. He described how the Commission has produced a set of guidelines for the way informatics services should be used within the Commission and across European Institutions. The main elements of these guidelines for an informatics architecture are summarised in Figure 1. Figures 2 to 4 show the general structure of the proposed architecture. A primary aim is to modernise the administration of the European Institutions and to organise the flow of information between them and the Member State administrations by the INSIS programme (Interinstitutional System for Integrated Services).

Figure 1
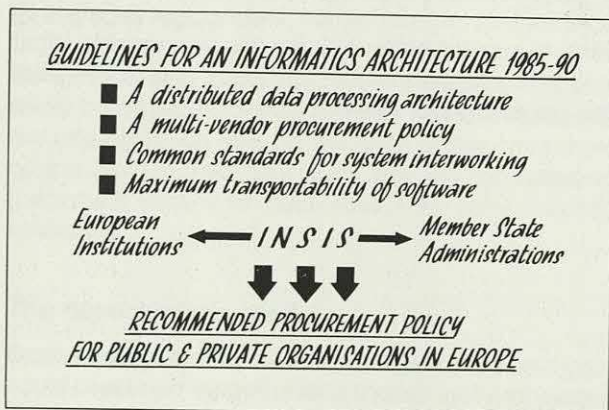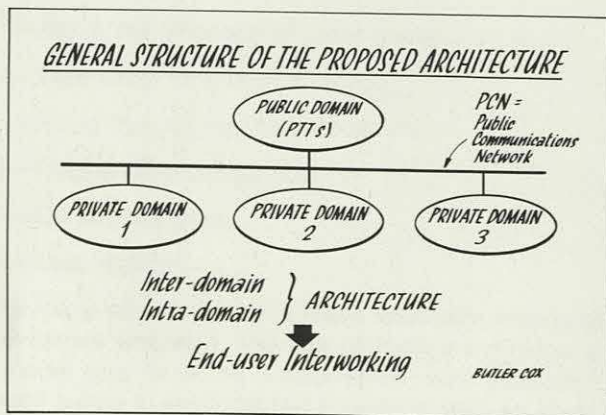
Standards are essential for intercommunication between institutions and, eventually, for interworking. They are also essential for interconnection, intercommunication and interconnection within a single institution. Furthermore, standards are vital to ensure supplier-independence, to protect existing investments against obsolescence and to promote free competition in the informatics industry.

The guidelines require the OSI (open system interconnection) principles to be adopted. However, they go further than OSI by proposing practical ways of cooperating in the implementation of application systems on a user-to-user basis, rather than just machine-to-machine.

The proposed measures include a policy to anticipate future international standards, working in conjunction with the manufacturers who will implement them. In addition, a limited range of software products will be adopted to avoid the proliferation of incompatible systems. Thus, transportable operating systems, such as Unix and MS-DOS, have been chosen in preference to new proprietary operating systems.

The guidelines also specify that standards are required at the human-interworking level. Integration of 'user' standards is needed in areas such as:

—Semantics and terminology (thesauri of terms, for example).

Figure 2

Les standards internationaux: Clef d'une srategie a long terme

Le Docteur W. de BACKER est Directeur de l'Informatique à la Commission Européenne depuis 1981. Il rappelle, au cours de son exposé, l'importance pour les sites informatiques d'adopter et de mettre en place une stratégie aussi indépendante que possible des politiques individuelles des constructeurs ou fournisseurs. Le Docteur de BACKER présente à cette occasion les mesures adoptées par la Commission Européenne à cet égard: Le programme INSIS, les accords de coopération passés avec les constructeurs, le renforcement des programmes inter-instituions.

Figure 3

GENERAL STRUCTURE OF THE PROPOSED ARCHITECTURE

Figure 4

GENERAL STRUCTURE OF THE PROPOSED ARCHITECTURE
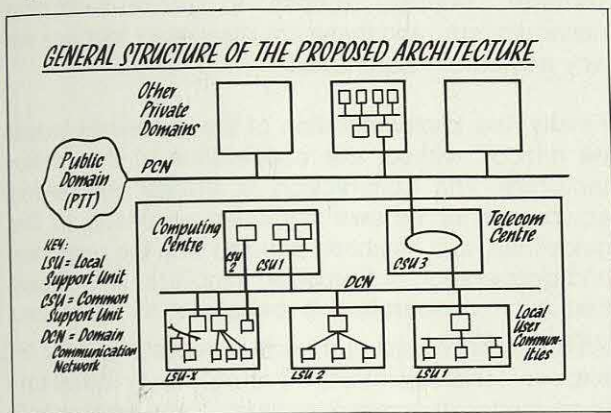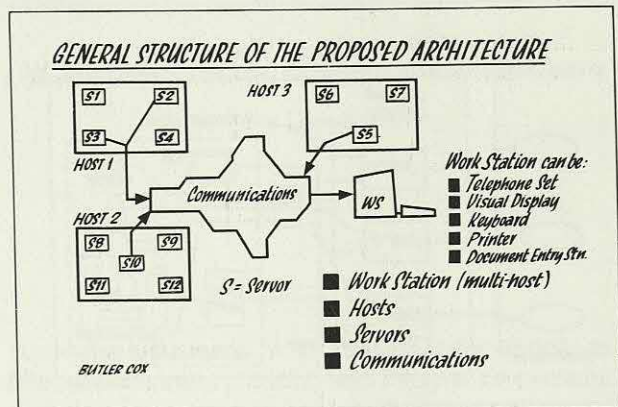
—Common definition of office procedures.

—Common definition of responsibilities for information management.

—Multilingual interworking.

The definition of standards in these areas will reduce the number of interfaces an individual user has to cope with. Dr de Backer described this as the 'user agent' concept, which will enable the user easily to find and use the required services.

The deployment of informatics resources proposed in the guidelines is based on a distributed architecture that reflects closely the way user communities are organised. Essentially, there are two layers that distinguish, within an institution, between local support units (LSUs) dedicated to a local user community with a close working relationship, and common support units (CSUs) dedicated to the institution as a whole (see Figure 3).

LSUs provide the flexibility to meet the different requirements of different user communities. CSUs

provide those services that cannot be provided economically within a smaller user community, or that cannot be distributed (common databases, for example), or that have to be centralised (common accounting, communication between institutions, etc.).

The guidelines recognise that information technology reaches the users in the form of different services (electronic mail, personal computing, access to databases, etc.). For this reason, the guidelines that deal with these services are dynamic. They will be reviewed constantly and updated as experience is gained and as new requirements arise.

The guidelines also recognise that a gradual transition will be required from today's manufacturer-oriented architecture to an open one that allows full interworking. The guidelines therefore foresee an evolutionary plan that will gradually achieve the intended goal (see Figures 5 to 7). Eventually, the user will be able to access the proposed architecture through a single multifunction workstation that integrates voice, data, text, graphics and image.

Figure 5

EVOLUTION : Past

Figure 6

EVOLUTION : Future

Figure 7

EVOLUTION : *Present Compromise*
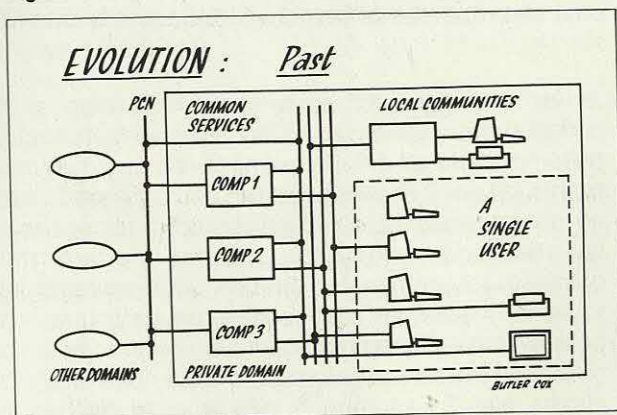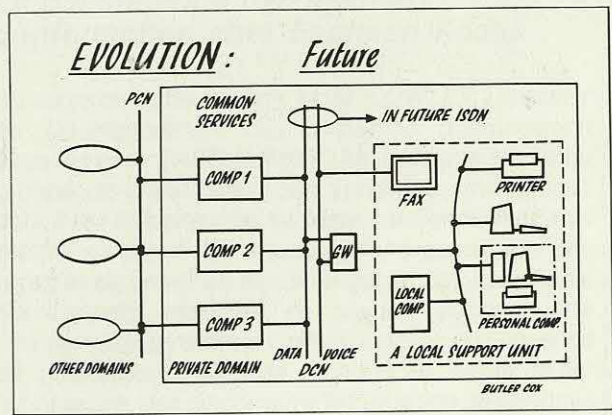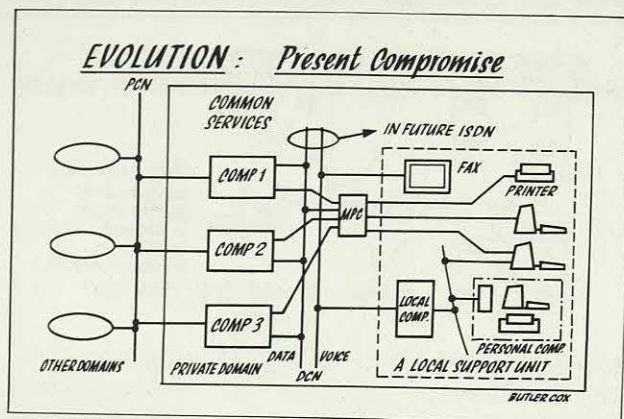
Initially, the emphasis will be on services such as file transfer, teletex, access to packet-switching networks, etc., and these are mandatory features for any equipment purchased.

Finally, the implementation of the guidelines would be difficult without the cooperation of the manufacturers. The Commission is already purchasing equipment for its own purposes according to the guidelines, and has been pleased with the response and cooperation of European suppliers. This shows that such cooperation is beneficial to users and suppliers alike.

APPLYING BUSINESS PRACTICES TO SYSTEMS PLANNING

W Michael Cowley, *Eastman Kodak Company*

W Michael Cowley is Director, Advanced and User Systems Architecture Development, in the Department of Information Systems Architecture at the Eastman Kodak Company.

Eastman Kodak Company defined the concept of Information Systems Architecture Development (ISAD), and placed the responsibility for it in a small group within the information systems function. Michael Cowley described how and why the group was formed, its structure, the architecture development process and some lessons that have been learned.

Since its inception 150 years ago, Eastman Kodak had been functionally organised. But all that changed two years ago when the business was reorganised into three groups: photographic, information systems and diversified technology. In addition, 17 different lines of business have been set up within Kodak to assume bottom-line responsibility for specific products.

These new developments had an obvious and profound impact on information systems, and further emphasised the need for an architecture to encompass changing requirements for information systems.

The current information systems organisation consists of approximately 4,000 persons worldwide. The ISAD group is part of the corporate information systems organisation of about 70 people that has functional responsibility for worldwide activities (see Figure 1 overleaf).

It is quite likely that over the next few years, information systems will be completely repositioned and restructured within Kodak. The factors promoting this change include the trend toward line-of-business management; increasing business dependence on information support; changing channels of information flow; end-user demands for desk-top computing power with access to departmental or centrally shared data resources; and the proliferation of information system technologies that are becoming imbedded in business operations. These trends demand that information systems are planned to

support the business. What ISAD is trying to do is to integrate business planning with information systems planning.

The IASD group and its role

In 1984, through the initiative of the photographic division's management, the ISAD group was formed with eight employees. One of the group's first tasks was to define what architecture would mean to the group and to the company. Mr Cowley likened the architecture, in the Kodak sense, to a city plan or map, but not just a one-dimensional sheet showing roadways and landmarks as dots and squares. The plan also shows the 'building codes' of the 'city' — ie the standards. It indicates the kind of investment decisions that are controlling construction in the 'city'; it shows the philosophy, or guiding direction, a vision of the future for the 'city'.

In business terms, the architecture is the structure for information systems. But it also contains the principles and guidelines of management, and the standards required in order to manage information systems and to achieve business objectives.

The work of the ISAD group can be likened to that of a traditional architect. An architect designs a structure that not only shelters and protects, but also

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La planification des systems d'information chez Eastman Kodak

Au cours de cette session, M. M. COWLEY, Directeur du Développement des systèmes d'Information avancés chez EASTMAN KODAK, présente le rôle du groupe de planification des systèmes stratégiques dont il est responsable. Il insiste sur l'importance de mettre en place les structures d'organisation des groupes de projet en fonction des tâches assignées, sur l'aspect essentiel de savoir "vendre" une stratégie aux Directions Opérationnelles en l'absence de toute autorité formelle, et sur la nécessité de lier les objectifs des systèmes d'information développés à ceux de l'entreprise.

Figure 1 Eastman Kodak organisation

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                        ┌─────────────────┐
                        │  Corporate CEO  │
                        │      and        │
                        │   President     │
                        └─────────────────┘
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| Corporate communications | Corporate relations | Finance and administration | Legal | Research and development | Eastman chemicals |

Life sciences

Eastman technology

Photographic and information management division

| Manufacturing and support operations | Manufacturing equipment | Customer and marketing support operations | Photographic products | Commercial & information systems | Diversified technologies | AAA |

Europe
Japan
Latin America
Kodak Canada

| Worldwide materials manufacturing | Worldwide equipment manufacturing | Worldwide services & distribution support | Business units | Business units | Business units |

Worldwide information systems

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enhances the lives of the people who live or work in it. The architect, therefore, needs to be aware of the current needs and future aspirations of the occupants.

Similarly, a system architect needs to be aware both of business needs, and of the external and economic forces that affect the business. He needs to develop a vision about the future. A good architect learns about the driving purposes of each occupant before designing the space, and makes informed judgements on what their needs will be in the future. This, in turn, emphasises strategic planning, and requires an understanding of the current forces operating in the field of interest and in society in general, and the economic factors that might relate to them. Only when all of this is gathered and absorbed is the architect ready to begin designing the structure.

While these processes are under way, the architect begins the subtle process of 'selling' the concept to the client. To do this, the architect must communicate the vision to each occupant, regardless of that person's background, knowledge or level of technological awareness.

Finally, and most significantly, the architect must let go of the project. Despite the fact that the architect has been totally absorbed in it for several months, involved in the nuances of the design and the personalities of the clients, he must realise that he does not own the resulting structure. For it to be useful, the architect must leave his creation and move on to a new vision.

In Kodak the central mission of the ISAD group is to provide the leadership in integrating information technology with business strategy. Figure 2 summarises the ISAD group's view of the processes and the infrastructures that interact in business. Originally, the main problem at Kodak was in the operations area depicted in the bottom right corner on the figure. The business tools in these areas were diverse and old. Quite a few of them were developed by staff people for staff people. This in itself would not have been necessarily wrong, but there was a lack of systems to support management. Redressing

Figure 2   Kodak's corporate information systems
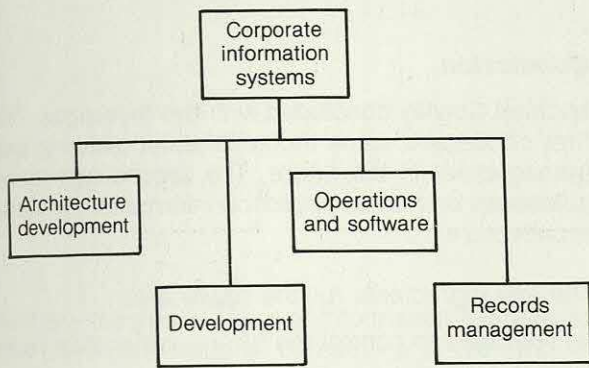
the balance and correcting the operational problems became a major challenge for the group.

To accomplish its mission, the ISAD group has segmented its activities into three areas:

—Those related to strategic business planning through management support systems.

—Those related to ongoing business activities through operational systems.

—Those related to developing a process for the architecture and the technology infrastructure that support the business.

In addition, the ISAD group has defined seven functions for architecture development. These are:

—Business information systems.

—Manufacturing information systems.

—Management support systems (end-user computing).

—Information resource management.

—Telecommunications.

—Hardware and system software.

—Industry standards.

The people in the ISAD group have very diverse backgrounds. Most were in non-technical management positions, in areas including planning, marketing and finance, and brought outstanding business skills to the group. They are mature senior-level people, and they are change agents and innovators, rather than adaptors. They have the ability to stand up in front of a crowd and they are well versed in the art of marketing their own ideas. They all have considerable experience in systems work, and have management expertise both inside and outside the information systems department. Their primary skills are in the areas of business, technology, and negotiation. They are what are called HITs — high-impact thinkers.

Psychological tests have shown that the people in the ISAD group are classified as original thinkers who are able to create ideas outside the confines of existing organisational guidelines.

The ISAD group has developed a set of 11 guiding principles:

—Global integration through information technology is the key.

—The customer owns it from the start.

—Business and customer interests drive the decisions.

—Simplicity in everything we do.

—Effectiveness results from synthesis before analysis.

—Bureaucracy is a cost we cannot afford.

—People add value.

—Learn by observation and experimentation.

—Mastery requires discipline.

—Innovation is the result of 'stretch' vision.

—Amplify our effectiveness through others.

Figure 3 depicts Kodak's information systems architecture. It deals with the various types of applications, their manifestation at corporate, group and local business levels and through the normal business functions which exist in the company. They are based on and interlinked through the underlying data and telecommunication architectures.

By managing this giant matrix, ISAD believes it can help Kodak to use information systems effectively in

Figure 3   Kodak's information systems architecture
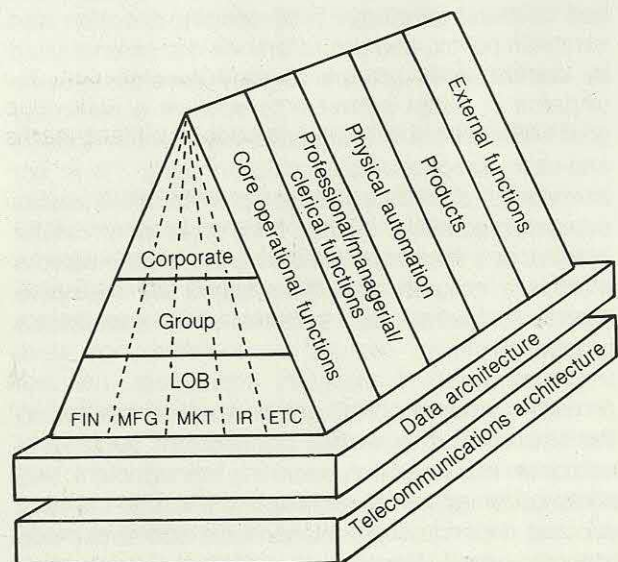
the business. By doing this, the need for a new function will be questioned before yet another functionally excellent, but perhaps ineffective, system is developed.

Developing the architecture

The architecture consists of three components: a business vision, a long-term information systems direction, and a tactical plan. The most difficult of these to derive is the business vision.

To facilitate the development of the business vision, ISAD has adopted the strategy centre concept which had been used in Kodak for business planning. In addition ISAD, together with the strategy centres, provides management, end users, and information systems personnel with a plan or 'blueprint' on how to manage and change the information systems environment. In many cases, this also results in significant changes in the way the business is conducted.

Strategy centres operate as a link to business strategy. They allow different perspectives to be brought to bear on an issue, and those perspectives help to prevent developments that in turn might prevent original thought. They synthesise the corporate view and reveal the assumptions behind it. Through continued discussions, objectives are aligned, areas of agreement are found, direction is established, and commitment is gained. The result of this process is the establishment of the architecture for a programme. But in the process, both technicians and business people learn about each other's viewpoint.

A strategy centre usually produces a directional plan. These plans are brief, concrete and realistic, and they are blueprints for thinking about information systems and business strategy. They specify direction and establish policy, and are reference documents used by departmental groups as they develop specific systems or adapt software to achieve a particular goal. For example, the objective statement in Kodak's end-user directional plan said (in part): "It is not intended to provide a detailed plan for all end-user computing activities. Rather, it will serve as an overall architecture for corporate and unit management to effectively integrate end-user systems with their core business operational systems and specialised functions".

A major part of architecture development is selling the strategies to a variety of important audiences: corporate management, operating management, and information systems technical personnel. ISAD's success depends on its relationships with all of these groups, which have very different needs and perceptions of ISAD's work. ISAD's job, therefore, is to tailor the architecture discussions to fit their needs and understandings.

Conclusion

Michael Cowley concluded with two messages. The first concerned some thoughts about planning and management in the future. The second was some guidelines on how to approach information systems architecture.

The key ingredients for the future are:

—You need to control the future, rather than react to it.

—Your plans must generate actions, and actions must drive strategy. This gives a new outlook on strategy.

—Your planning must be continuous, participative and holistic. This means that plans need to encompass and protect the integrity of the whole.

—You must learn to manage change and choice, in addition to functions.

—You need to start doing the right things, rather than doing things right. Most organisations today are preoccupied with doing the thing right, and this leads to an emphasis on analysis. The opposite of analysis is the process of synthesis, and synthesis is fundamental to doing the right thing.

—You must have organisations that can act and think strategically.

—You must make sure you have a decision-making process that is not bound by organisational structural constraints.

In general, the process of architecture development needs top-level business sponsorship. In Kodak the senior vice-president of the photographic division was the sponsor. In addition, staff participating in architecture development should be a mixture of high-impact thinkers and adaptors. The architecture process needs to be established, and it needs to be tied to the business planning process. It is also necessary to establish strong relationships outside your company, and to obtain news of other companies and trends in your industries.

Finally, the use of prototypes is a good way of achieving early sucesses. But no success can be achieved without marketing, so you need to market your activities throughout the organisation.

ISAD believes it now has a significant role in the future of the company, but there is still a lot to do. As a result of its efforts in architecture development, Kodak's managers now regard information systems more as an asset than as an expense.

COMPUTING FOR COMPETITIVE EDGE

Anthony Bargioni, *Beecham Group*

Anthony Bargioni is Head of Information Systems for the Beecham Group of companies in the UK. His early career was one of technical specialisation; more recently he has concentrated on one of the fundamental issues of data processing — how to change the traditional data processing department, with its own momentum and culture, into being genuinely integrated with the commercial environment of the business.

(Editorial note: A full transcript of this presentation has been published separately by Butler Cox. Copies are available, at no charge, from any Butler Cox office.)

SIX KEY ISSUES FOR THE NEXT DECADE

Anthony began his presentation by dismissing as irrelevant the 'conventional wisdom' about the major information system management challenges. Instead of concentrating on technical issues such as the quality of service provided, data security, responsiveness to requests for new work, development productivity, control of personal computing, office automation, networking techniques, and so forth, he proposed six major areas that information system managers should address:

—Understand the business in which you operate.

—Adopt the organisation's culture.

—Earn the stature to enter the corridors of power.

—Learn how to sell ideas effectively.

—Understand the importance of organisational maturity.

—Continue to manage the technical strategy.

To be in a position to help shape business thinking, information system managers must first acquire a fundamental knowledge about their organisation's business and its marketplace. What are the critical success factors? Why do people buy our product rather than our competitors'? What do our customers think about us? What strategies are our competitors following? What new strategies are we employing? How is our marketplace changing? How do our performance ratios compare with our competitors'? Is the make-up of our costs changing? Are overheads increasing? How is the performance of our managing directors measured?

To be able to 'sell' its ideas to the business, the culture of the systems department must be compatible with that of the organisation. If the business culture is entrepreneurial, its management expects fast-moving entrepreneurial management action, and the systems department would be wise to operate in a compatible style. This may mean it is necessary for the department to abandon some of its entrenched 'professional data processing' attitudes and practices.

Stature comes from the recognition of, and confidence in, the contribution being made by an individual or a department. Only once this stature has been earned will information systems managers be admitted to the 'corridors of power' where the really significant business decisions are made.

Once admitted to the decision-making 'club', it will be necessary to 'sell' our ideas effectively. At this level, business decisions are not based so much on logical rational arguments but on intuitive judgements. The implication is that information systems managers must develop greater ability in forming relationships,

Informatiser pour etre plus competitif

M. A. BARGIONI est le Directeur des Systèmes d'Information du groupe BEECHAM. Depuis quelques années, il s'est préoccupé d'un élément trop souvent ignoré par les Dirigeants Informatiques : Comment transformer un département informatique traditionnel, avec son inertie et sa culture usuelles, en une fonction réellement intégrée à l'environnement commercial de son entreprise? Changer le style de la fonction informatique sans pour autant diminuer son expertise et son savoir-faire a été une des grandes difficulté de cette tâche. Le point de vue de M. BARGIONI bien que fort apprécié par les utilisateurs, est souvent controversé par ses collègues informaticiens...

in managing the art of persuasion, and in refining tactics for selling an idea within an organisation or group of people.

The maturity of the organisation in using, accepting and feeling comfortable with managing information technology is also a critical issue. Acquainting top managers with the maturing process, and gaining their support and assistance in managing it, is a major contributor to overcoming the previous four problems.

Technical strategies also have to be well managed, but the other five areas need much greater attention than they are currently receiving.

CASE HISTORIES

Anthony then quoted two case histories that illustrated the key issues that need to be addressed.

Consumer products industry (sales and marketing)

This case history concerns a successful project to provide better information to account managers following a decision to invest in systems that would help to increase sales volume. Anthony highlighted the following features:

— The original planning exercise was led by the managing director of the business.

— The systems plan was produced by the directors.

— The investment had to produce a short-term return (within one year).

— Conventional development methods would have been too slow, so a prototyping approach was used.

— The systems director had gained the personal confidence of the managing director.

— The systems members of the planning team had business knowledge that was appropriate to the particular business environment.

— The systems department adopted an opportunistic approach based on prototyping.

— The marketing department provided a mature environment that was very keen to adopt new ideas.

— The development project was led by the sales planning manager, who was transfered to the systems department. This meant that the project was 'driven' by the project team, not by the users.

Consumer products industry (sales force)

This case history is based on the installation of videotex technology to enable field salesmen to transmit orders from their homes to the company. The original aim was to reduce the cost of the administration procedures for collecting orders. However, once the directors of the company became involved with the decision, the primary aim of the system was elevated to improving communications between the company and its field staff.

The key lessons to be learnt from this company's experience are:

— The strategic decision to expand the objective was made by the directors because they perceived that poor communications with remote staff was a fundamental constraint on 'sharp-end' competitiveness.

— The system was implemented in a way that provided immediate and visible benefits.

— The directors had confidence in the project team.

PRACTICAL GUIDELINES

Anthony Bargioni concluded his presentation by providing five practical guidelines.

Recruit a different type of person

The traditional data processing person, who is able to work in a logical structured way, will continue to be required to build and run conventional systems. But, from now on, a different type of person will be required as well — people with a 'feel' for the business and who are interested in, and good at, dealing with people, and who are prepared to take risks. The psychological makeup of this type of person is almost the complete opposite of the typical data processing professional.

Recruit front-men from the business

The 'feelers' and business innovators will only be found within the business, or will have spent most of their careers in a non-technical role. Within the systems department, these people become the interface between the businessman and the computer technologist. They become the major source of business systems innovations, and they are the major influence in gaining user directors' support for new systems ideas.

Match the style of the business

Systems staff must adopt an attitude, a state of mind, that will make them seem responsive in a way that the business recognises. If the business is entrepreneurial, the systems department must be prepared to respond in a similar way and, where appropriate, to work in unconventional ways.

Establish a user-services centre

In Beecham, the role of the information centre has been expanded to include development responsibility for specialist management (decision support) systems. The people running the user-services centre are ex-businessmen from the sales and marketing areas of the business. The team has been accepted by the business, is highly respected by top management and has produced highly innovative contributions to business computing. The emphasis is on helping users to help themselves.

Match the systems planning process with the business planning process

Within the sales-dominated environment of Beecham's consumer products business, most planning is typically short-term. The planning for systems matches this culture. Instead of a large planning committee, the innovators and opinion leaders develop ideas informally and then 'sell' them to the decision makers. However, an element of more formal planning has been introduced as an aid to the organisational maturing process.

SUMMARY

In general, information systems managers spend most of their time on topics (often technology-related) that are not the most important issues for the next decade. People, not technology, provide the major constraints. Anthony Bargioni summarised the main message of his presentation by saying that the information systems function has to have earned a major stature in business terms before it can become a prime-mover for major business changes. The easiest way to achieve the required stature is to 'fit' the system department to the organisation, and matching the cultural style of the business is a key aspect of doing this.

It will be necessary to invent good ideas for using computers in new and innovative ways, and the best way of doing this is to create an environment in which business experience can combine with an understanding of what the technology can do. But even good ideas need to be sold, and systems managers need to recognise the importance of paying greater attention to inter-personal skills. Only when the systems function has these skills on board will it be able to play a leading role in initiating change in the company.

Finally, the task of the information systems manager will be much easier if the organisation as a whole is experienced, and feels comfortable, with the concept of using investments in computing as a means to gaining a competitive edge. Building confidence, and generally progressing and managing the organisational learning process, is probably on the critical path to ultimate success. Information systems managers must therefore be prepared to devote time and effort to these tasks, even if it means diverting resources from other more immediate activites.

COMMUNICATING ELECTRONICALLY WITH THE MARKET

Roy Bright, *Independent Consultant*

Roy Bright spent 20 years in various commercial managerial roles with British Telecom where he was responsible for the market development of several major services, including packet switching, digital data and Prestel. In 1979, he was invited by the French PTT to establish Intelmatique, the international marketing organisation for the Télématique Programme. Since 1984 he has been running his own international consultancy organisation.

Increasingly, the general public is being asked to adopt new technology (such as videotex, microcomputers and smart cards) at a faster rate than ever before. Two problems are often encountered: the failure to provide ease-of-use; and the failure to provide a cost-justification for using the technology. In addition, the users' likely reaction to the new technology is often neglected. As a consequence, there are many recent examples of failures in trying to introduce new technology to a mass market. These failures have been due to the market not being properly identified, to the lack of proper education, and to an inability to motivate a mass market to understand the benefits and opportunities provided by the new technology.

Prestel's difficulties in penetrating the residential sector in the United Kingdom is typical. It has taken six years for Prestel to make a profit and, even now, only 50 per cent of Prestel's business is in the residential sector. In West Germany, the high cost of terminals, and consumer indifference, has resulted in similar problems for Bildschirmtext — only 30,000 users compared with a forecast of 100,000 made eighteen months ago. In France, the smart card has met similar difficulties.

The main problem has been the over-emphasis on technology and a lack of attention to the users' concerns. Moreover, it is difficult to identify and profile the typical consumer. Many of these products are aimed at the full spectrum of users. These problems are also experienced with the business user.

Consumer-resistance problems are just as prevalent in North America. A classic example is the videotex systems based on the North American Presentation Level Protocol Syntax (NAPLPS). NALPS was designed to provide superior graphics facilities compared with the European systems, on the expectation of attracting big advertising revenues for mass-market videotex services. The superior facilities meant that the terminals were expensive — $600, even when heavily subsidised.

It was very easy to sell the concept of the superior product to very senior executives. However the system operators had neglected to identify the size of the market in which the advertisers would be willing to participate and invest money. After two years, only 2,000 terminals had been sold in affluent southern Florida. No one was interested in advertising to such a small market. In terms of the original objective, the enterprise was a resounding failure.

However, a new joint venture by AT&T, CBS and Sears will now offer a videotex service based on low-price black and white terminals (costing $300). The root cause of the problems with the American videotex systems can be traced to the emphasis placed on the views of advertising agencies instead of those of the consumer.

Roy Bright then turned his attention to some of the positive experiences in France.

Electronic telephone directories

The electronic directory programme is a major part of the French strategy for establishing a télématique

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Savoir communiquer 'Electroniquement' avec son environnement

M. R. BRIGHT, actuellement Consultant indépendant, a été précédemment à la tête d'Intelmatique, branche de la DGT responsable du marketing international des produits télématiques français. La session, animée par M. BRIGHT, fait le point sur l'emploi des technologies de l'information comme outil de communication avec le marché potentiel, particulièrement les technologies liées au Videotex et à la carte à mémoire.

society by the 1990s. The programme is intended to replace the traditional printed directory and directory enquiry service offered to telephone subscribers. The electronic directory service comprises:

— 'White pages', which can be searched alphabetically.

— 'Yellow pages', structured by professional classification.

— 'Pink and blue pages', which contain administrative and telecommunications information, such as the costs of international calls, dialling codes and postal codes.

The aim is for 30 per cent of the telephone population to be using the electronic directory by 1990. Subscribers are being equipped with Minitel monochrome terminals. These terminals have a nine-inch screen, full alphanumeric keyboards and integrated modems. The terminals are provided free to residential subscribers. Business users get one terminal free of charge and can either rent others (at 40FF per month) from the PTT or can buy direct from the manufacturers.

White and yellow pages are updated daily. Advertising updates are annual — a policy decision — but more frequent updating is likely. The service is cheaper to use than the traditional service — the first three minutes of use are free with a charge of 0.77 FF being levied on every subsequent two minutes.

The service first opened in 1983, and a national database is now available, allowing any Minitel user to obtain telephone numbers of all French telephone subscribers. By the end of September 1985, over one million Minitels had been installed, with 1.5 million expected by the end of 1985 and 3 million by the end of 1986. The monthly growth was expected to be 50,000 reaching 70,000 by the end of 1985 — but it has reached 100,000 already.

Besides the availability of up-to-date directories, users are also provided with the following facilities:

— Partial address searches.

— Extended geographic searches — if, say, the search failed in the expected geographic area.

— Similar sounding spellings can be searched.

— Related descriptions for professional classifications.

— Adaptability in accommodating both casual and frequent users.

The service responds within 10 to 12 seconds to an accurate search definition.

Users' reactions are favourable. All Minitel users can still use the traditional directory enquiry service, but

in 1983/84, 50 per cent of them preferred to use the electronic service. And the proportion has now risen to 60 per cent. Seven million accesses are currently being made each month by the one million users. The multi-page ''adformation'' (the term adopted for advertising information) is very popular with the users. All the market research results point to a positive reaction.

Electronic publishing

The Minitel is completely compatible with every Télétel (videotex) database developed by any company in France. Minitel users are actively encouraged to use their terminals to access services other than the electronic directory. This has led to a tremendous growth of electronic publishing services aimed both at residential and business users. But the initial reaction of publishers was negative. Electronic publishing was seen as a threat to traditional circulations and to classified advertising revenues. And the print unions were concerned about the threats to jobs.

However, the publisher of ''Liberation'' recently described videotex-based electronic publishing as: ''a newspaper manager's dream — a way to generate more advertising revenue and to sell more papers''. Liberation, a French national daily newspaper with a circulation of 300,000 opened a videotex service two years ago — using a system with 112 ports. The service receives 9,000 calls every 24 hours. Individuals directly key 14,000 personal advertisements (e.g. for cars) every month through their Minitels, compared with less than 1,000 traditional hard-copy advertisements placed per month in Liberation.

Liberation's initial investment was repaid in the first year. And electronic advertising rates are cheaper than the hard copy equivalents. Profits of $450,000 are projected for the second year of the service (1985). Overheads are minimal as the consumer incurrs all the effort in setting up the advertisement.

Funitel

Another mass-market example is provided by Funitel, set up in 1984. This electronic-leisure service includes interactive games, serious horoscopes, Tarot readings, educational quizzes, psychological and aptitude tests, and two-player games such as chess. The use of the service is increasing rapidly:

— March 1985 : 35,000 user hours (first month of operation).

— April 1985 : 82,000 user hours.

— May 1985 : in excess of 100,000 user hours.

— December 1985 : 250,000 user hours expected.

The average call to Funitel lasts 14 minutes. The service has not been advertised — this tremendous

growth has been achieved by word of mouth, and an entry in the list of available services. Funitel achieved revenues of $307,000 in April and $375,000 in May 1985. By March 1986, an annual revenue of between $5 million and $7 million is expected.

Smart cards

The smart card provides another mass-market example of new technology. These cards replace magnetic-stripe cards in banking and point-of-sale transactions. The cards have not yet reached the user, yet they have already become a significant force in the marketplace among the organisations who expect to employ them. The consumers' response remains to be seen — although Roy Bright expects this to be positive.

Orders placed with Bull by service operators are:

—200,000 cards in 1985.

—3,000,000 cards in 1986.

—4,000,000 cards in 1987.

—5,000,000 cards in 1988.

Another four million cards are to be ordered from Philips. The average price of the card is $2.94, compared with 65 to 70 cents for a magnetic-stripe card.

The total value of equipment to support the use of smart cards is $102 million — including the cost of the cards themselves, shop terminals and readers, card certifiers and central site equipment. The retailers are still concerned as to who will pay for this equipment — they believe that they should not bear the cost.

The smart card will have many applications and also permit multiple transactions — recording both the telephone charge and, say, the taxi charge when requesting this service over the telephone, for example.

About 30,000 to 40,000 smart cards have already been used in the trials. The views of users participating in the trials have been taken on board by the operators. The lessons from the trials point to an over-emphasis on the technological capabilities of the services and insufficient emphasis on why the consumer should use them.

Conclusion

In order for new technology to appeal to the vast majority of users, they need to be stimulated, educated and persuaded by practical and worthwhile features. The key lesson is that the product should offer added value in the eyes of every user — value that can be readily appreciated and enjoyed by both new and expert users.

RE-ORIENTING CORPORATE STRATEGY

William H Miller, *Kansas City Power & Light*

Bill Miller is vice-president of administration at Kansas City Power & Light. Under his direction, the computer services division has acquired industry recognition through the implementation of leading-edge technologies.

Kansas City Power & Light (KCPL) is a $300 million turnover public utility, with some 30,000 employees and a $10 million computer division budget.

Bill Miller joined the company in 1979, with responsibility for human resources and personnel and with a clear view of the need to use computers to control staff numbers in his department.

Although he had originally planned to install an IBM minicomputer to meet his needs, he agreed to accept online terminals linked to the company's Sperry mainframes, and to use Mapper, Sperry's fourth-generation system development tool. Using Mapper he completed development of his human resources system in six months.

This experience totally changed KCPL's approach to computing over the next five years. It also led to Bill Miller taking responsibility for the computer division and, later, for office automation.

The change

A full assessment of the situation existing in 1979, and the likely demand for computer services and resources during the remainder of the 1980s, revealed a picture that the company considered unacceptable. For example:

—It was expected that the demand for new services, which was around 500 in that year with a backlog of 25 systems, would grow five-fold by 1990 and the backlog to almost 1,000 systems.

—Programmer numbers would increase from under 45 to 120, in order to keep the backlog to less than 1,000 systems.

—Systems staff costs would total $11 million over the period to 1990 and even this investment would not avoid 'analysis paralysis'.

The most significant technical change was a switch away from central system development using traditional methods, to user-developed systems using Mapper through online terminals and PCs. This in turn led to the creation of a totally new corporate information culture.

The strategic plan

Fundamental changes could not be implemented overnight, nor without the most careful consideration. The change process was focused in 1983 on the development of a comprehensive strategic plan. The planning process involved the following steps:

—A review of the existing situation.

—A review of the key technology trends, including hardware, software, networking and related changes in computer literacy and skills.

—An analysis of the current computer environment's strengths and weaknesses (summarised in Figure 1 overleaf).

—A specification of the types of services requiring to be supplied within the new strategy.

—The identification of the future computing facilities that were needed to provide the services specified.

—The functional organisation of the computer division, under the headings of information systems, information control centre, and office information services.

Impact des technologies de l'information sur la strategie d'un groups

Le développement des moyens informatiques au sein de la KANSAS CITY POWER AND LIGHT (KCPL) a amené une transformation importante de la culture professionnelle dans ce groupe: Bill MILLER, Vice-Président de la KCPL, explique de quelle manière la stratégie des technologies de l'information a été utilisée pour changer fondamentalement l'orientation de sa société d'une préoccupation de production vers une préoccupation de marketing. Il précise également le rôle que la fonction "Systèmes d'Information" devra se voir attribuer dans l'élaboration et la mise en pratique du plan stratégique global de l'entreprise.

Figure 1   KCPL computing environment

WHAT ARE	
STRENGTHS	**LIMITATIONS**
● Computer technology knowledge	● Lack of resources to support our own division
● Creative and innovative personnel	● Lack of personnel to meet all user needs
● State-of-art information systems	● Personal communications barriers
● State-of-art computer hardware	● Analysis paralysis
● Data network penetrates company	● Some systems need to be brought up to current software
● Leaders in 'end-user-computing'	● Backlog of work continues to grow
● Computer literacy high through company	

—A review of how systems were developed, whether by users or a central project team.

—An evaluation of the strengths and weaknesses of user development systems (summarised in Figure 2), focusing on the use of Mapper, communicating PCs and PC package software.

—A projection of installed terminals, PCs and word processors that need to be supported (see Figure 3).

With the strategy established, the next task was to sell it to senior and user management and to the central programming staff. This was achieved, though not without some resistance from those managers who preferred not to take on responsibility for systems development, and from programming staff, who were nervous about being decentralised into user departments.

The strategic plan also identified that, with the company becoming increasingly dependent on its computer systems, a back-up site was required to safeguard the company against computer failure. A six-week shutdown due to a system catastrophe would cost the company some $86 million. The cost of a back-up site was considerably less than the cost of servicing a credit facility for this amount. The back-up site had to be as disaster-proof as possible, especially against the risk of tornadoes and sabotage. The go ahead for the back-up site was given and an underground limestone mine (The Cave) close to Kansas City was chosen and equipped.

The results of the changes

The main consequence of the changes implemented can be grouped under five headings:

—Programmers have been moved into user departments.

—All central computer services and staff have moved into The Cave.

—Users have accepted fully their responsibility for developing, maintaining and changing their own systems. They welcome the situation and the system backlog has been virtually eliminated.

Figure 2   User developed systems

Advantages	Disadvantages
● Information systems are developed by individuals who truly understand needs	● Without central coordination duplication of information could be created
● Users quickly satisfy spontaneous demands for information	● Not all users are interested in developing their own systems
● Users more knowledgeble of application and use their own creativity in system design	● Pooling of resources to accomplish a company priority is more difficult
● Knowledge of system remains with user	
● Backlog and wait for traditional programming is by-passed	
● User can be more effective by easily changing priority of work to be done	

Figure 3 Terminal/PC/WP growth

- Terminals
- Personal computers
- Word processors
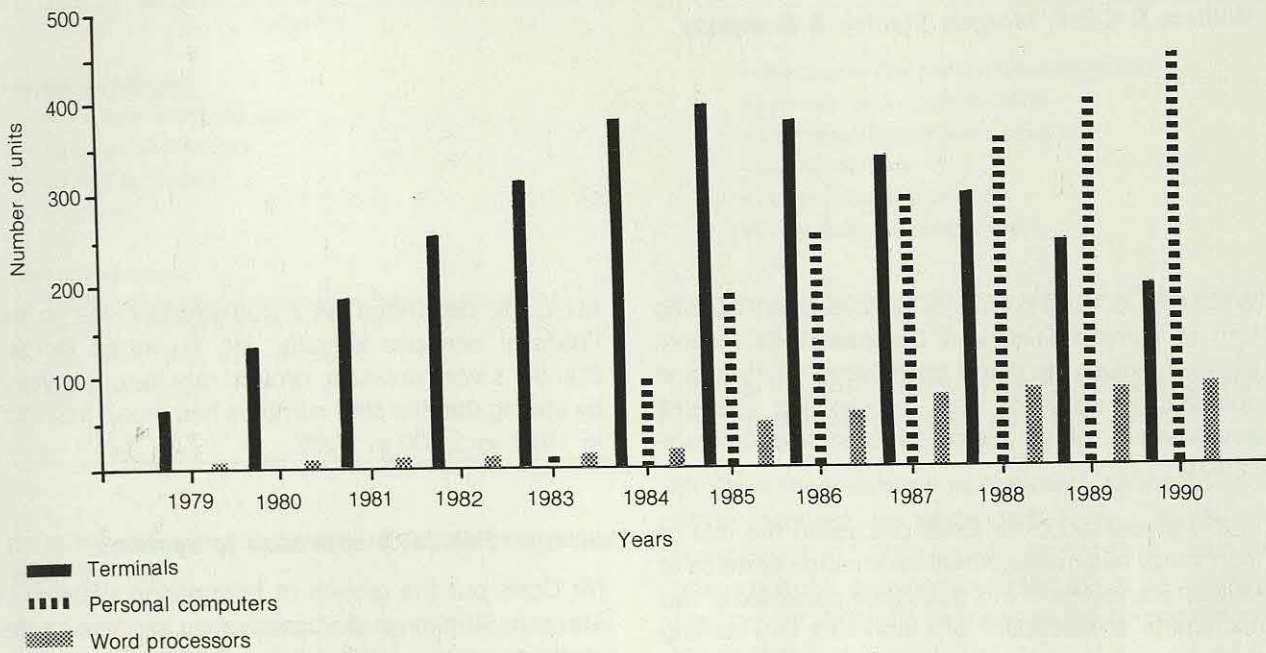
—The computer services division has chosen to become a profit centre, and trades commercially with user departments.

—The computer division has taken on a quite new role within the company.

The first and last of these changes need further elaboration and insight. The decentralisation of programming staff was achieved with few problems. Most programmers are happy with the change and have benefited by a much greater understanding of the business, (though inevitably a few have left), and user departments have accepted the need to maintain salary levels.

The main new responsibilities of the central computer services division can be summarised as follows:

—Ensuring 100 per cent mainframe resource availability.

—Providing users with Mapper software training and support.

—Maintaining an information centre data catalogue, to minimise the risk of users duplicating files of information.

—Ensuring the quality of all systems.

—Achieving system integration and ensuring users are aware of the impact of their system changes on other users.

—Developing an engineering support centre for users of external IBM-based services.

—Controlling the implementation of office systems, usually on PCs for occasional users and on dedicated word processors for full-time typists.

By the end of 1985, 1,384 out of the 1,500 workers (92 per cent) with a need for computer support have been trained and are fully able to use the company's systems to do their own work. So in the words of Bill Miller, "We think our approach is working".

USING TECHNOLOGY TO IMPROVE COMPETITIVE ABILITY

William B Cook, *Morgan Stanley & Company*

William B Cook is a partner in the investment banking firm of Morgan Stanley & Company. His responsibilities include technical businesses, analytic and quantitative systems, data processing, systems development, office automation and telecommunications.

In this presentation Mr Cook discussed the role of technology and management information systems at Morgan Stanley Bank. His discussion consisted of two main parts: a description of a landmark MIS staffing experiment conducted by the bank, and an examination of how MIS is organised to increase the penetration of information technology into the lifeblood of the firm's business. He also discussed briefly the bank's plans for information technology over the next five years, and made general recommendations as to what other organisations should be doing to improve their competitive position through the use of information technology.

Morgan Stanley's business

Mr Cook began by describing the major thrust of Morgan Stanley's business interests. He described the firm as being more like Merrill Lynch than Citibank with one of the largest investment portfolios in the United States.

The firm has long-standing relationships with most of its predominantly blue-chip clients and provides what

Mr Cook described as a full product line in the financial services industry. He illustrated Morgan Stanley's very dramatic growth rate in recent years by stating that the staff numbers had grown from 400 in 1970 to 3,700 in 1985.

Morgan Stanley's approach to systems

Mr Cook put the growth of information systems in Morgan Stanley in perspective by discussing the statistics shown in Figure 1.

Of particular interest to the audience was the eighteen-fold increase over the last five years in the installed processing power per development staff.

During a discussion about the critical aspects of Morgan Stanley's business in relation to information systems he made a very strong case for the use, at all levels of the systems function, of highly qualified graduates with a liberal arts education. Morgan Stanley has established a policy of bringing graduates into the systems department as computer operators at very high salaries with the intention of moving them quickly through the various systems grades. It is clearly understood by all systems staff that either they

Figure 1

MIS Growth Over Five Years		
	80	85
Systems Headcount	46	120
MIPS	1.6	117
Billions Bytes of Disk	10	280
MIPS for Sys. Dev.	.4	22+
MIPS/Developer	.01	.18

Mieux utiliser la technologie pour etre plus competitif

Le propos de M. W. COOK est d'illustrer le rôle de la technologie informatique et du système d'information (MIS) au travers des développements mis en place à la banque MORGAN STANLEY & CO. La session comprend deux parties principales: Présenter le bilan de l'expérience MIS et en tirer les conclusions, particulièrement en ce qui concerne les conséquences sur l'organisation. M. COOK présente ensuite ses projets pour les cinq années à venir. M. COOK est actuellement "Partner" de la MORGAN STANLEY aprés en avoir été Vice-President chargé des systèmes d'information.

Figure 2

MIS–1979

Initiatives

- Technical Initiatives:
  - Fourth Generation Languages
  - Hardware per Developer
  - Sound Basic System
  - Prototyping

- Human Resources:
  - College Campus Recruiting Program Geared Toward the Top Students at the Top Schools
  - Aggressive Compensation Program
  - Up or Out Program

Figure 4

Risks

- Changing the Composition of the Systems Staff
- Elimination of Computer Operators
- Commitment to High Level Languages
- Multi-Vendor Shop
- Rewrite of Basic System
- Internalization of the Price Feed

perform well and are promoted regularly, or they leave the firm.

The bank's management feels that this approach, coupled with other major initiatives (such as those shown in Figure 2), has paid handsome dividends in the productivity of systems staff. Mr Cook stated that the firm's policy is, wherever possible, to "leverage people with technology". In this way, the bank can take advantage of the dramatic price/performance improvements in computer hardware while reducing the firm's salary expenditure.

Results achieved

The results of these initiatives were summed up very clearly with the slide shown in Figure 3. Mr Cook pointed out that the average cost per program developed had fallen from more than $8,000 in 1980 to just over $1,500 in 1984. More importantly, major

areas of the firm's business are now fully automated and are performing better than ever before.

Mr Cook then went on to elaborate on the obvious risks involved in these initiatives. These are summarised in Figure 4. Chief among them were the major cultural changes imposed upon the systems staff by the dramatic changes in the composition of the systems staff.

However, as Mr Cook pointed out, in most cases you cannot accomplish anything worthwhile without taking risks. These carefully considered risks have paid off for Morgan Stanley in many important ways.

These results were also summarised in another way when Mr Cook discussed the 'assets and liabilities' of the firm's systems function (see in Figure 5). The most important of the assets to many of the audience was the ability to build quickly the quality systems that provide a competitive business advantage for the firm.

Figure 3

Results 1979–1984

- Sound Basic Systems–Front Office, Back Office
- Extraordinary Human Resources
- Capability to Build Systems Fast
  - Cost per Program 1980 $8,785
    Cost per Program 1984 $1,677
- Internalized All Time Sharing
- Extraordinary Growth in Computing
  - PCM Strategy for Cost Containment
- Compensation Under Control
  - Compounded Percent Increase 2.28%

Figure 5

MIS 1984

Assets and Liabilities

Assets

- Sound Basic Systems
- Extraordinary Human Resources
- Capability to Build Systems Fast
- Air Cover

Liabilities

- Retention of Trainees
- Recruiting of Senior Technical Individuals
- What We Work On
- Cost of Computing

Figure 6

MIS 1985

Objectives

The MIS Department Must Become a Technology Profit Center:
    Improve Recruiting
    Improve Retention
    Contribute Capital for the Expansion of Technology
The MIS Department Must Become an Experimental Automated Brokerage Firm:
    Lead the Way for the Firm
    The MIS Department Must Eventually Be Integrated into the Firm

Conclusion

Mr Cook concluded his presentation by providing an overview of the future plans for systems in the firm. These plans are summarised in Figure 6.

The senior management at Morgan Stanley is very keen to establish the systems function as a profit centre, with the use of information technology as an intrinsic part of the firm's business. Excellent results have already been achieved. From Mr Cook's comments it is clear that even more dramatic contributions are expected from the systems function in the future.

AUSTRALIA

BP AUSTRALIA .... Rod Young

MOBIL OIL .... Grant Barrett

BELGIUM, LUXEMBOURG, AND THE NETHERLANDS

AEGON .... R Szepansky
C van den Hoven

AHOLD .... C H van der Hoeven

AMRO BANK .... S Betten

AKZO .... H Heidema

BANKGIROCENTRALE .... F van Velzen

DSM .... N Duynisveld

HOLLANDSCHE BETON GROEP .... J Maat

IBM .... J van den Bersselaar

IBM INS .... M Jeffrey

MONSANTO EUROPE .... Eric Marlow

NATIONALE NEDERLANDEN .... E Kist
D van Wijk

NEDERLANDSE CREDIETBANK .... N Jongerius

NEDERLANDSE PHILIPS BEDRIJVEN .... C Bouten

NEDERLANDSE REASSURANTIE GROEP .... P Zandhuis

PHILIPS INTERNATIONAL .... P Rijnierse

PTT .... F Franse
C Vermij

LIST OF DELEGATES

SOCIETE GENERALE DE BANQUE .... M Bernard
S de Hepcee
A Tihon

TNO .... L Muijen

UNILEVER .... D Hewson

VOLMAC .... N Panken

WESTLAND/UTRECHT HYPOTHEEKBANK .... F Blommers
M Bolle

FRANCE

AIR FRANCE .... M Levasseur

BARCLAYS BANK .... M Cauchy
M Dubrulle

BULL .... M Cuignet
M Laurent

CIBA-GEIGY .... M Bettoni
M Burge
M Pelliet

CIE FRANCAISE PETROLES .... M Gianinazzi

DIRECTION GENERALE DES IMPOTS .... M Fontaine

EDF-GDF .... M Graff
M Mailliard
M Toulet

FRANCE-CABLES & RADIO .... M de Gayffier

IBM FRANCE .... M Ragot

JEUMONT SCHNEIDER .... M Touze

MINISTERE DES FINANCES .... M Faure

PEUGEOT .... M Krautter

RATP .... M Courtois
M Gedin
M Renault
M des Rochettes

SCHLUMBERGER .... M Muller

SFENA .... M Darricaux

STE FRANCAISE PETROLES BP .... M Verdier

STE NATIONALE ELF AQUITAINE .... M Nardon

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THOMSON GRAND PUBLIC .... M Leblanc
M Tassin
M Weber

ITALY

AMMINISTRAZIONE SENATO DELLA REPUBBLICA .... Raffaele Giordano
Carlo Pinzani

ATAC .... Giacomo Palumbo

BARILLA .... Claudio Scarduelli

BANCO SAN SPIRITO .... Guiseppe Gaeta
Adriano Pincherle

BANCA D'AMERICA E D'ITALIA .... Claude Daniel Wolff

ENEA .... Agostino Mathis

FISCAMBI .... Francesco Ariatta

IBM .... Donatella Valseschini

ISTAT .... Gerardo Giacummo
Sergio Lucarelli

PIRELLI .... Paolo Bonisolli

SISDOBDA .... Fiamma Pintacuda

SCANDINAVIA

AMS .... Jan Torlen

BERGEN BANK .... Stein Nielsen

MOLLER-GRUPPEN .... Kjell Erik Gravning

SAAB SCANIA .... Sven Yngvell

SKF .... Hakan Landahl
Goran Ljungdahl

STATSKONSULT .... Ann Maria Ekmark
Bo Loven
Hans Wessel

SWEDISH NATIONAL ROAD ADMINISTRATION .... Uno Danielson
Hans Ekberg

VESTA HYGEA .... Ove Methlie
Oyvind Rasmussen

LIST OF DELEGATES

SOUTH AFRICA

GENCOR COMPUTER SERVICES	W Bekker
LEGAL & GENERAL VOLKSKAS	P Connolly

UNITED KINGDOM

AGB	Martin Ray
ALLIED-LYONS	Peter Bird Keith Harvey David Randall Alf White John White
BASS	Michael Jones Michael Shorthouse Brian Wilson
BAT	Bruce Shilstone
BEECHAM GROUP	Frank Bowater
BICC	John Pope
BOWATER INDUSTRIES	Dan Docherty
BRITISH LIBRARY	David Martin
BRITISH NUCLEAR FUELS	Fred Elliott Alan Harrison
BP INTERNATIONAL	John Greensmith
BP OIL	Keith Foster
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Butler Cox & Partners

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

Objectives of the Foundation

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

New developments in technology offer exciting opportunities — and also pose certain threats — for all organisations, whether in industry, commerce or government. New types of systems, combining computers, telecommunications and automated office equipment, are becoming not only possible, but also economically feasible.

As a result, any manager who is responsible for introducing new systems is confronted with the crucial question of how best to fit these elements together in ways that are effective, practical and economic.

While the equipment is becoming cheaper, the reverse is true of people — and this applies both to the people who design systems and those who make use of them. At the same time, human considerations become even more important as people's attitudes towards their working environment change.

These developments raise new questions for the manager of the information systems function as he seeks to determine and achieve the best economic mix from this technology.

Membership of the Foundation

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

The Foundation Research Programme

The research programme is planned jointly by Butler Cox and by the member organisations. Each year Butler Cox draws up a short-list of topics that reflects the Foundation's view of the important issues in information systems technology and its application. Member organisations rank the topics according to their own requirements and as a result of this process members' preferences are determined.

Before each research project starts there is a further opportunity for members to influence the direction of the research. A detailed description of the project defining its scope and the issues to be addressed is sent to all members for comment.

The Report Series

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