

Pan-European Communications: Threats and Opportunities

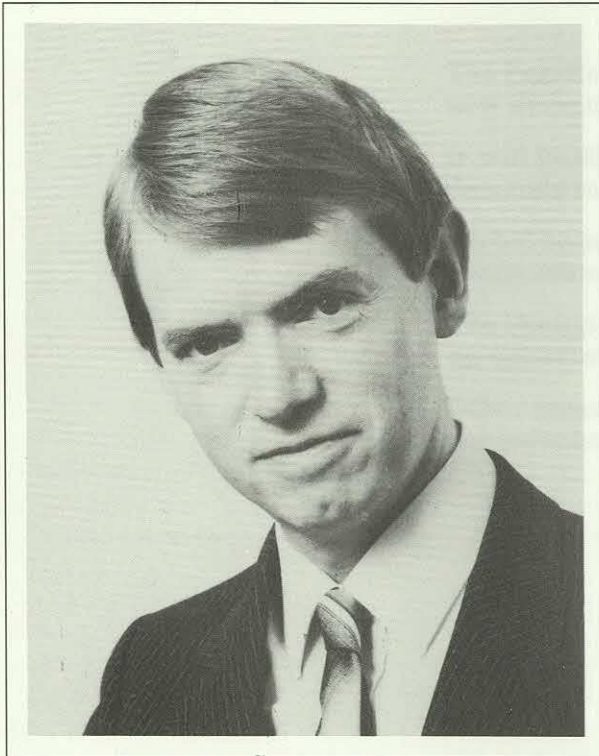
BUTLER COX
FOUNDATION

A Paper by Jim Norton
July 1989



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Jim Norton is a principal consultant with Butler Cox, and director of the company's vendor consultancy practice. In this capacity, he specialises in business development and strategy for suppliers of information technology products and services. Prior to joining Butler Cox, he spent 17 years with British Telecom (BT), most recently as senior manager, business development projects, for BT International.

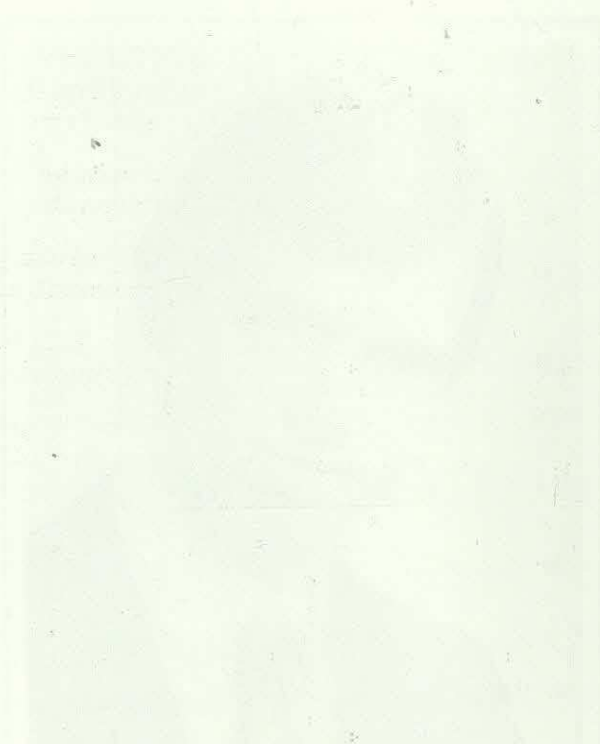
Rapid changes are occurring in the European marketplace for communications products and services — changes in the nature of demand and competition, in the availability of skills, in the regulatory environment, in standardisation, and so on. As from any other period of turbulent change, both threats and opportunities will emerge. Suppliers who cling for survival to the old structures will face growing competition in an industry where the pace of change is very rapid. User organisations and suppliers who are prepared to acknowledge the scope of the changes and respond to them can shape developments to their advantage.

BUTLER COX
FOUNDATION

European Communications
Threats and Opportunities

A Paper by the Author
July 1989

The author is a senior executive of a large international company and has been involved in the development of the company's international communications strategy. He is currently responsible for the company's international communications strategy and is a member of the company's international communications committee. He has been involved in the development of the company's international communications strategy for over 10 years and has been responsible for the company's international communications strategy for over 10 years. He has been involved in the development of the company's international communications strategy for over 10 years and has been responsible for the company's international communications strategy for over 10 years.



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Pan-European Communications: Threats and Opportunities

The European marketplace for communications products and services is undergoing rapid and fundamental change. The scope of change is so large and the pace so fast that the very structure of the market, which has evolved over the past 30 years, is being shattered, and a new order is forming to replace the old. Substantial changes in the nature of demand and competition, the availability of skills, regulatory constraints, standardisation, and so on, are all occurring simultaneously. Any period of turbulent change can be seen as both a threat and an opportunity — a threat to those equipment suppliers who have operated in 'closed' non-competitive national markets, and an opportunity for those suppliers and user organisations that are prepared to acknowledge the change and exploit it, shaping developments to their advantage.

The purpose of this paper is to review the main forces for change and to predict their impact over the next five years on those businesses that have pan-European requirements for communications products and services. We chart the growth of service offerings, taking managed data network services as the pivotal development, and identify the kinds of services that major users of international communications are likely to require.

The pan-European growth of business will create new demands for communications services

In response to the demands of 1992 and the single unified market in Europe, business activities are becoming more geographically dispersed, and this will fundamentally change the demands for communications products and services. The principle of the expanded market is real, and the removal of tariff barriers

between the 12 members is a necessary part of the process of expanding business in a wider Europe. However, to achieve the full benefit of the enlarged market, businesses will have to be aware of the non-tariff barriers as well. Manufacturing companies, for example, will find that they cannot simply have a massive plant in Antwerp or the Ruhr, and send out sales staff across Europe. To do substantial business in a European country, a company will have to contribute to the economy of that country, and to do this, it will have to disperse its operations. To circumvent the non-tariff barriers, it may, for example, find it necessary to have its research and development department in France, its manufacturing plants in West Germany, and its warehousing facilities in the Netherlands. The communications needed to support such a distributed business will be substantial, and critical to its success. The pan-European expansion of business will thus create a new class of demand within Europe for intracompany communications products and services.

This new demand can be split into three distinct classes. The first is for better use of basic facilities — such as leased circuits. These facilities represent a base cost and are neither product-critical nor profit-critical. The second is the demand for better infrastructure — things that do not fundamentally change either the business that a company is involved in, or the countries that it operates in, but that may enable it to operate more efficiently. An example would be moving applications from paper onto electronic systems, such as electronic data interchange (EDI). The third demand will be for applications that can give a company an advantage over its competitors. For example, if a company wants to enter the financial services market — say, the retail banking market of another EC country — it is likely to

do so by electronic means rather than by building physical branches across Europe. It might, for example, install teller terminals or electronic service points in the premises of another chain of companies, such as a major retailer.

It will be difficult for companies to meet these demands in-house

It will be difficult to meet these demands for new services because there is a major and growing shortage of people skilled in modern communications techniques in Europe (and, for that matter, worldwide). In 1987, we asked 120 systems directors, in 18 countries, what the most serious constraint was on their development of networked systems. We expected that it might be a lack of funds, or incompatible standards. In fact, the almost unanimous answer in Italy, Scandinavia, Spain, the United Kingdom, and West Germany was a shortage of people qualified to build the systems from the vendors' components. While the problem in France is less severe, the French are certainly not immune to it. This skills problem facing communications users is equally bad in the United States. Perhaps surprisingly, it is a problem in Japan as well.

The growing shortage of skills will have profound implications for the way in which user organisations respond to the challenge of meeting new telecommunications demands. While it is natural for companies to want to meet these challenges in-house, the 'private army' approach is clearly no longer valid; the qualified staff are simply not available. As one systems director said, "First, we cannot recruit enough skilled people. Then, we cannot retain those we do recruit. If we bribe them to stay, we upset everybody else in the company. There has to be an alternative." The situation is made worse by the fact that effective communications systems are becoming more and more critical to the business, and it is therefore unacceptable that the business should be dependent for its success on its ability to recruit and retain skills that are tangential to its mainstream business.

Global competition is changing the nature of the communications market

The increase in worldwide competition is causing the communications suppliers to

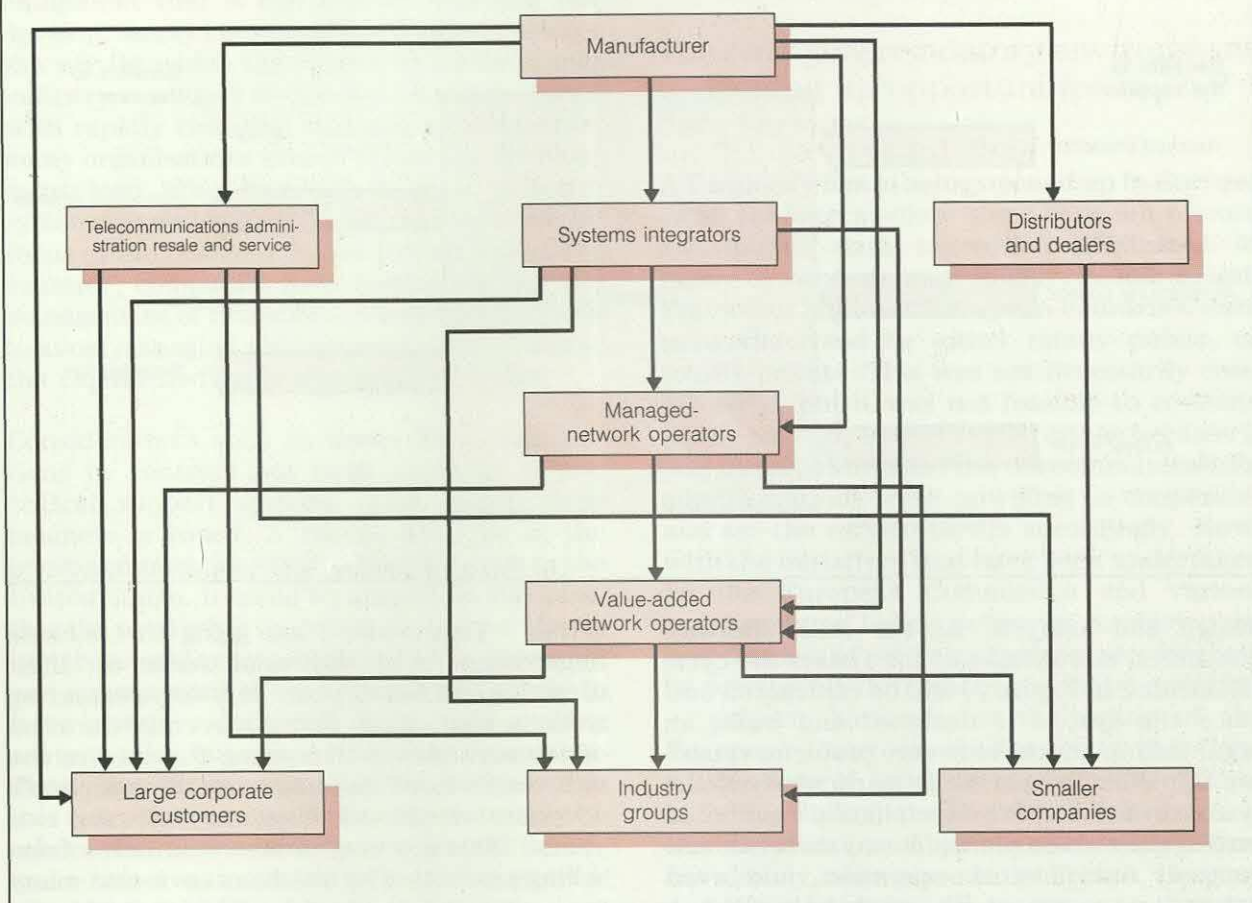
polarise. In the United Kingdom, for example, there were, until recently, many relatively successful communications product companies. They were moderately large and moderately innovative. Many of them have failed or been acquired over the last three or four years. Today, there are a limited number of very large suppliers of commodity products, assembled in Taiwan or some other low-cost area, and marketed worldwide, together with smaller companies selling a totally new concept, or a totally new product. There is no longer a place for moderately innovative and moderately large-scale suppliers.

The business of supplying commodity communication products has become exceedingly low-margin. Ten years ago, various products that are now commonplace, like packet switches and big multiplexors, were high-value, high-margin items; today, there is hardly any product in the area of either data communications or telecommunications that commands high margins. This means that while all these items are cheaper to buy, the number of suppliers with a long-term future is sharply restricted.

Suppliers are also moving steadily out of the pure products business and into services — first, into consultancy, then into systems integration, operation and management, and eventually, into facilities management. Because individual user organisations are having difficulty putting the pieces together, it is becoming very attractive for suppliers to move into systems integration. Where, traditionally, telecommunications managers or data processing managers would have purchased directly from a vendor, they are now much more likely to call on a systems integrator, a managed-network operator, or a value-added network operator. Figure 1 shows the new types of relationships between vendors and customers.

The major manufacturers, particularly in the computer industry, have already begun to take on each of these roles. IBM is a good example. The company fundamentally reorganised its business in the United States in 1988 to create a new line of business called 'application solutions', with a view to meeting a demonstrable customer need for systems integration. It carries out about half the work in-house, and half through associate companies and third parties. These moves, drawing attention first to its systems integration capabilities, and latterly

Figure 1 New types of relationships have been created between vendors and customers



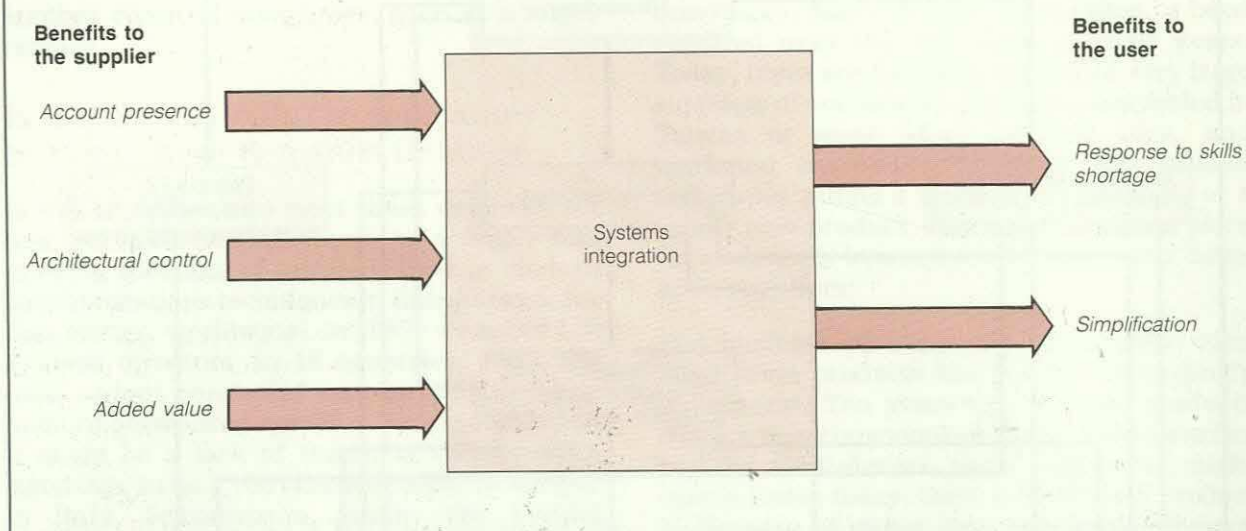
to its worldwide managed-network operations and its value-added operations, were not made in a spirit of benevolence. They were made in direct response to an evident customer problem.

Major users have the business applications needs and the money to finance hardware and software purchases. They will not, however, 'sign the cheque' if all that happens is that a disparate collection of components is delivered — lines, switches, processors, control systems, software, and so on. Assistance to convert the 'boxes' into a working, integrated business system, has become an essential requirement. As Figure 2, overleaf, shows, the benefits to customers of using a systems integration company are that the skills shortage can be overcome and that the process of implementing a complex working system is simplified. We believe that the importance of these benefits means that the trend towards contracting out systems integration will continue to grow.

For the supplier, the main benefit of systems integration is that it provides significant account control over the customer. In addition, it often allows the supplier to define the architecture within which the customer's system is built, and it allows the supplier to add value to what is being directly sold. The user, on the other hand, chooses to contract out systems integration, and hence to become locked in to some extent, either to overcome the skills shortage, or to ease the problem of dealing with all the pieces of equipment and all the points of contact. Can a company safely contract out, and if so, how much can it contract out? Are there elements of the business that are so important that they must be dealt with in-house, whatever the cost? Are there other elements that particularly lend themselves to being contracted out?

Organisations have traditionally contracted out some of the initial elements of the typical life cycle of a communications system — such as

Figure 2 Systems integration provides benefits both to suppliers and to users



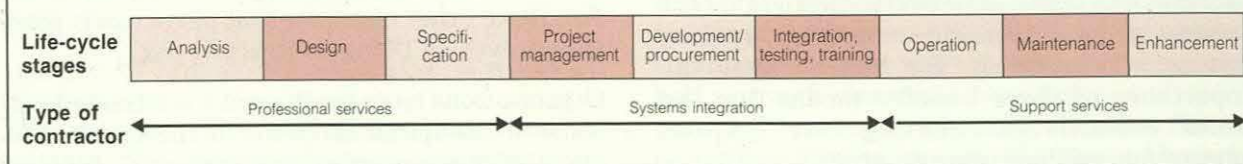
design and analysis. As the skills shortage continues, more stages of the system life cycle (illustrated in Figure 3) will be contracted out. Once the system is designed and built, an organisation may have severe problems retaining the skills to operate it, particularly if the system or network is geographically distributed across national boundaries. It may therefore also contract out network operation, and even network management. The market for network operation and network management, with the exception of the third-party maintenance segment, is as yet embryonic, although it has every prospect of growing rapidly.

Contracting out at least part of network operation and management can be regarded as the ultimate lock-in. As far as the supplier is concerned, it is an excellent source of long-term revenues — five-, seven-, or ten-year contracts. A board member of a supplier of such services once summed up the difference between 'product' and 'service' suppliers in the following

terms. "Tomorrow, I am going to conclude negotiations with my sales force on their targeting and bonus plans. It is very reassuring to know that, given that the average duration of our contracts is five years, I could fire the entire sales force tomorrow and the company's revenues would not begin to drop for two years!" This is a very different situation from selling products. The disadvantage is that many user organisations would regard it, and fear it, as the ultimate in account control by the supplier.

Why, then, do organisations contract out? First, organisations will pay a premium for predictability. For example, in the financial services area, they will pay a premium to know the future cost, year by year, of processing a transaction. That premium can be quite large, as long as the price is fixed. They are prepared to pay more because it reduces the level of risk. Second, it insulates the company from the skills shortage, and from technological obsolescence,

Figure 3 External contractors can be used at each stage of the system life cycle



potentially improving responsiveness. No organisation wants to end up with a lot of equipment that it can neither maintain nor develop, simply because it was unable to predict the way in which the communications-supply industry was likely to develop. Similarly, faced with rapidly changing business requirements, many organisations cannot afford the development lead time inherent in their in-house systems organisations. Third, it improves the focus of the business. In the United States, for example, companies have contracted out the management of financial services systems, both to avoid managing a big network, and to release the capital tied up in the network assets.

Considerations such as these drive organisations to contract out large amounts of the critical support systems upon which their business is based. A recent example in the telecommunications field is Merrill Lynch in the United States. It could be argued, in this case, that the network is the business, and yet Merrill Lynch is seeking to contract out the operation and management of the network and simply to have a service delivered. It is an astonishing route to take, but one that is worth examining. There may be some parts of the business that it is essential to retain in-house; there may be others that will have to be contracted out, to make resources available for essential internal developments. The benefits to vendors and

users of contracting out network operation and management are summarised in Figure 4.

The changing regulatory environment is opening up opportunities in data services

A Pandora's box is being opened up in Europe, as all the intermediate steps between private and public data networks, illustrated in Figure 5, overleaf, are gradually becoming legal. Previously, in most European countries, data networks could be either totally public, or totally private. This was not necessarily cost-effective, but it was not feasible to combine public and private networks, either because it was illegal, or because the telecommunications administrations were unwilling to cooperate, and set the service tariffs accordingly. Now, with the initiatives that have been undertaken by the European Commission and various member states, hybrid networks, combining the best features of public and private services, will be permissible throughout the EC by mid-1991 — subject, however, to the ruling of the European Court on challenges to the Commission's use of Article 90 of the Treaty of Rome in forcing through the liberalisation. In practice, the liberalisation, subject to minor restrictions, has already taken place in the French, German, and UK markets.

Figure 4 There are benefits for both vendors and users in contracting out network operation and management

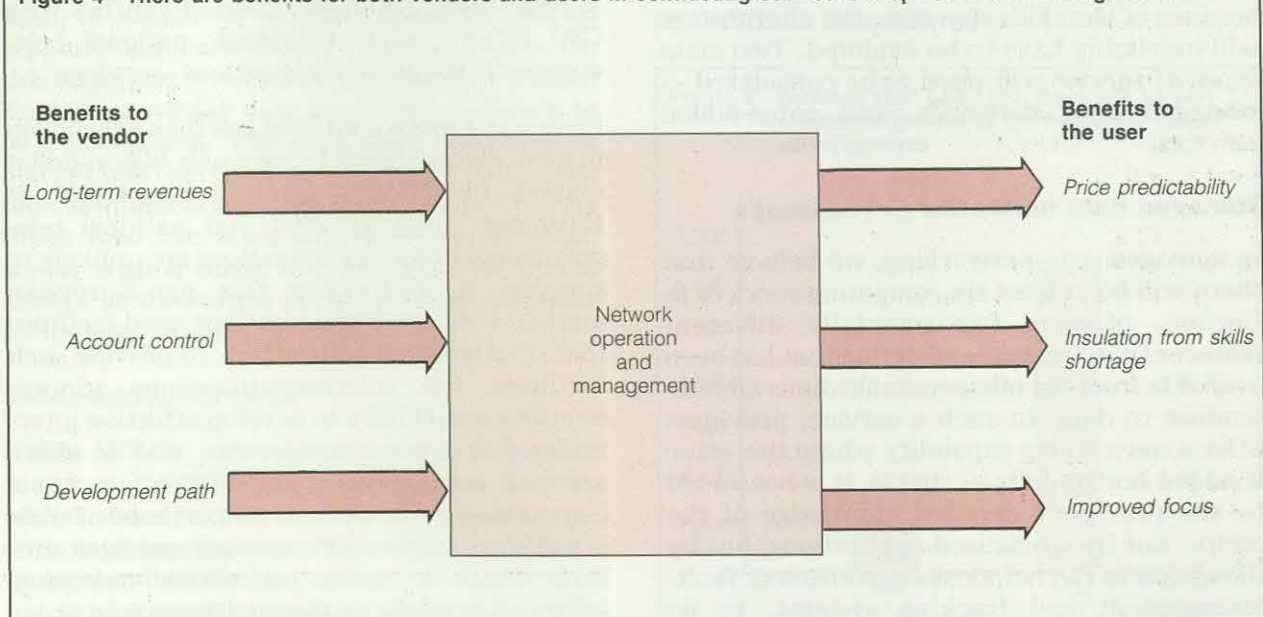
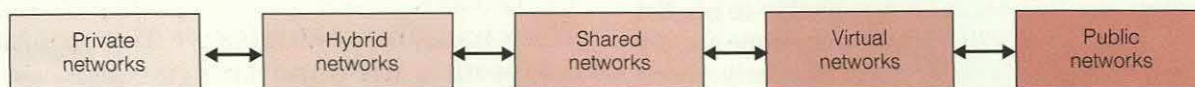


Figure 5 The changing regulatory environment is opening up new opportunities in data services



This merely brings Europe into line with conventional practice in the United States. Traditionally, the corporate core of a US network is private, and the more lightly used periphery is public. Private Tymnet, for example, might use the public Tymnet as the periphery; private Telenet might use the public Telenet as a periphery; private IBM might use the IBM Information Network as the periphery. These options have been tested and used, and as the regulatory framework in Europe is changed, there will be a growth in such hybrid activity. The telecommunications administrations will respond with virtual networking, known in the United States, for example, as software-defined networking. A strong market for independent, managed data network operators — as third parties — will develop.

Telecommunications and data processing managers will therefore be faced with the challenge of making unbiased decisions about which of these options is best for their business. Were it not for the lack of appropriate skills, few would consider any option other than private; because of the skills shortage, the alternatives will inevitably have to be explored. Two main types of service will need to be considered — managed data networks, and value-added services.

Managed data networks

In managed data networking, we believe that there will be at least six competing services in Europe, offering fundamentally different features from the national option that has been available from the telecommunications administration to date. In such a service, providers offer a networking capability where the value is added horizontally — that is, it is not added by the provider's detailed knowledge of the sector, nor by specialised applications, but by the ability to run helpdesks and efficient fault-management and tracking systems, to do

protocol conversion, to offer flexible accounting, and so on. The value is not specific to a sector; it is inherent in the facilities and services provided by the network.

Some of these managed data network services (MDNSs) have been in operation for many years. Geisco, with its Marknet, for example, operated for a long time on the borders of legality by special arrangements with telecommunications administrations. Tymnet has existed with a predominantly US focus for many years. Now, there are further options available. Computer Sciences Corporation (CSC) is greatly expanding its Infonet activity by shared-equity joint ventures with leading national telecommunications administrations around the world. IBM is aggressively selling its Information Network worldwide. National joint ventures, such as INS in the United Kingdom between Geisco and STL/ICL, are flourishing. Even the European telecommunications administrations have come together under the aegis of CEPT to form Mitos BV, although prospects for this company appear bleak, given its apparent conflict with CSC Infonet and individual, national telecommunications administrations' services.

From a European market of less than \$85 million in 1987, we are likely to see a new billion-dollar market for MDNSs meeting the needs of European users by 1992, but national telecommunications administrations are unlikely to succeed in addressing this pan-European market. First, user organisations need facilities that span national boundaries. To provide such facilities, the telecommunications administrations would have to develop effective international account management, and to share account management information on their biggest customers. There is no likelihood of their providing a single CEPT account manager, and little basis of trust on which customer information might be shared. Centralised order

taking is not a substitute for account management. Second, each national telecommunications administration has an investment in, for example, packet switching, and each of these national investments is fundamentally incompatible. In the United Kingdom, the packet-switching network is based on Telenet; the French network is based on Alcatel switches; the German network will be based on Siemens technology, and so on.

The fact that they all use variations of the X.25 interface to the customer does not make the problems any easier to solve. The X.25 implementations are subtly different in each country. While national service quality is, by and large, good, the quality of service internationally, via X.75 gateways, is appalling, and is acknowledged to be so. Similarly, where a telecommunications administration provides a proprietary service locally, such as IBM's 3270 SNA, over a packet-switching network, there is no equivalent international service unless, by chance, a common hardware base exists, such as that between British Telecom in the United Kingdom and Telenet in the United States.

Since multiple gateways to convert the full features of X.25 and the variety of proprietary protocols demanded by users are not feasible, all that the telecommunications administrations could do is to construct a shared overlay network across Europe. Such an investment would directly compete with their existing national services, because major users would wish to attach to a single network, not to separate national and international services. On this basis, the investment for the much needed European overlay data network is unlikely to be forthcoming. The managed data network market will therefore be developed, not by the telecommunications administrations, but by those who can start with a relatively clean sheet, with a single account manager across Europe or around the world, and with the same technology in each country.

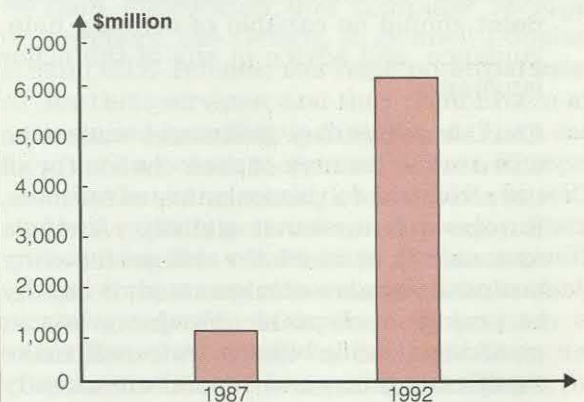
Value-added services

Unlike MDNSs, value-added services (VASs) are sector-specific. The main difference is that the added value is not technology-related — it derives from the service provider's detailed understanding of the customs, practices, and needs of a specific industry segment, such as

insurance, law, or financial services. The value is added vertically. MDNSs and VASs are thus fundamentally different types of business. The skills required, the investment profile, the pay-back period, and so on are radically dissimilar. Frequently, the two are lumped together in a so-called value-added network (VAN). This is largely because early VASs, such as SWIFT for banking and SITA for airlines, had, by special agreement with the telecommunications administrations, to build their own networks, because MDNSs were illegal in Europe at the time. Such confusion can be unhelpful to both provider and user alike. The different skills required to provide a networking service and sector-specific applications seldom sit comfortably together. Even where a single vendor provides both, it is important to manage and treat them as the separate businesses that they are. For users, it may be better to identify the best application first, and to access it via a more general-purpose network service.

We expect very substantial growth in the VAS market, as Figure 6 illustrates. This growth will stem from entrepreneurs who have spent many years in the particular industries and command detailed knowledge, and the respect of and sales contacts with their industry peers. The more successful national network operators, such as France Telecom, have accepted the need to stimulate and facilitate such entrepreneurial activity, seeking their own return from the additional communications demand so created, rather than from the applications themselves.

Figure 6 Between 1987 and 1992, there will be very substantial growth in the market for value-added services



Typically, a VAS grows initially within an industry segment, with the provision of both unstructured messaging via X.400 and structured messaging in the form of EDI. Additional services for database access and query handling follow. As individual segment services become established, further demand is created for cross-segment services, such as EDI 'bridges' between different industry-sector standards. Such services are inevitably shared or hybrid rather than private, and add to the growing role of the third-party providers.

Users' requirements

The requirements for pan-European data communications services resulting from the geographic spread of business operations are deceptively simple and straight-forward. Essentially, businesses require single points of contact across national boundaries, and a harmonised approach to regulation and service provision:

- *A single point for account management:* Telecommunications managers do not have the time to deal with account managers from a range of national telecommunications administrations, all of whom will offer discounted international circuits if the network hub is relocated to their country. The requirement is for an account manager who will make authoritative proposals for the entire system.
- *A single point for fault reporting:* Pan-European (or worldwide) fault reporting, management, and correction, are required, with appropriate mechanisms for the resolution of complex faults (not 'finger pointing' as to where the fault lies).
- *A single multilingual helpdesk:* A single point should be capable of offering help, guidance, and advice in any of the major languages.
- *Flexible accounting:* Businesses want to be billed in the country of their choice, for all the activities of a particular line of business, Europe-wide or even globally. A single national bill, in which the charges for many business units are amalgamated, is rapidly becoming unacceptable. Vendors who can provide a flexible billing service will make significant gains, and several are already planning to do so.
- *A range of quality/tariff options:* The telecommunications administrations in Europe were established 60 years ago to provide a single level of service that did not discriminate between potential users, either by size or by location (in other words, a universal service). It is not therefore surprising that they cannot, overnight, offer the range of service options that businesses now want. In the case of international leased circuits, for example, the quality of service provided by the telecommunications administrations is inadequate for many business-critical or financial-services applications. Organisations are obliged to build complete networks on top of what is provided by the telecommunications administrations, simply to increase the reliability of the basic service. On the other hand, there are services (store-and-forward, for example) that do not require the level of quality provided by internationally leased circuits. In this situation, the service tariffs (which reflect the quality of the circuits) could be significantly lower if a lower level of service was acceptable. What is required is a range of quality-vs-tariff options.
- *Open systems basic service with proprietary support:* Users of pan-European business data services may wish to run an open systems basic network — supporting X.25 interfaces, for example — but they probably already have a large commitment to existing proprietary systems. They might have long-term plans to introduce open systems gradually, and eventually to write off their original investment in proprietary systems. However, they cannot immediately

Such services will, of course, create problems of tax and contract law, and these will have to be resolved. In the United States, for example, one state has recently authorised a communications tax. Clearly, this tax can apply only to communications inside that state; where communications cross the state boundary, the tax no longer applies. Breaking down all communications to define those parts that are taxable and those that are not is a far from simple task. Similar problems will arise in Europe from different value-added tax rates, different national tax rates, sales tax rates, and so on.

abandon all the proprietary investment that they have, and start afresh. A migration strategy is required.

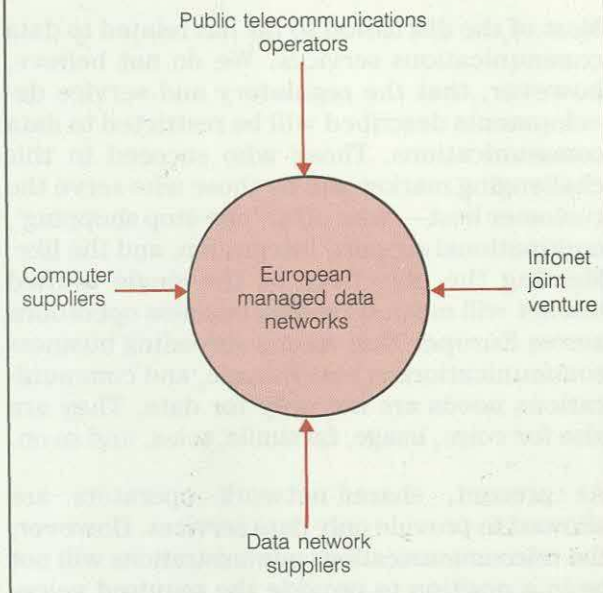
- *Identical interfaces and unified regulatory approval:* There are many telecommunications managers and data communications managers who would like to be able to buy the same terminal anywhere in Europe, and to plug it in anywhere in Europe. This demand for identical interfaces is not unreasonable. Linked to this is a need for unified regulatory approvals. In this area, there is at least some current progress.

The likely service providers

There are four types of service provider who might be in a position to respond to the challenge of meeting these user requirements for pan-European data communications (see Figure 7):

- *The telecommunications administrations* have the three attributes that would normally guarantee business success — their existing customer base, the infrastructure (in place right across Europe), and access to substantial financial resources. What they do not have is a *compatible* international infrastructure, nor any way of establishing mutual trust for joint development. They are unlikely to be successful, except through the presence of intermediaries such as CSC.
- *The hybrid telecommunications operators*, such as CSC Infonet's joint venture with telecommunications administrations, may well be successful, but the key to their success is how well they resolve sales conflicts with national administrations. The sales force for Infonet is separate from the national telecommunications administration's account-management force. If it remains separate, the administration's account managers are likely to do their best to support the national service rather than the joint venture. The main advantage of this type of joint venture is that a unified overlay network will exist, and is available for launching new services.
- *The computer suppliers*, and IBM in particular. IBM has had its Information Network for some years, but it restricted sales effort to intercompany (so called 'inter-

Figure 7 Four types of service provider might respond to the need for pan-European data communications



enterprise') networking in support of applications such as EDI. It did not encourage intracompany shared networking, because this would displace existing private SNA networks. Only since the middle of 1987 has IBM started to advocate the Information Network as an alternative to private networking. For IBM, this changed emphasis is something of an exercise in damage limitation. Private-network sales would generate the greatest total revenue, but with its main accounts under threat from plug-compatible shared networking, IBM appears prepared to compromise.

- *Data networking and computer services suppliers*, like Geisco, McDonnell Douglas, and GTE-Telenet, see huge potential sales for their services, and they do not have an installed base that is threatened. They can create a coherent network across Europe, or around the world, or install links with their existing networks, and develop a new business. This combination of data-network and computer-services suppliers is probably the group that is in the best position to exploit the change in demand. They are poised to meet the users' requirements for pan-European data communications.

Other communications services will develop concurrently with data services

Most of the discussion so far has related to data communications services. We do not believe, however, that the regulatory and service developments described will be restricted to data communications. Those who succeed in this challenging market will be those who serve the customer best — who offer 'one-stop shopping', multinational support, integration, and the like. Meeting the objectives of the single unified market will mean spreading business operations across Europe. That means spreading business communications across Europe, and communications needs are not only for data. They are also for voice, image, facsimile, telex, and so on.

At present, shared-network operators are allowed to provide only data services. However, the telecommunications administrations will not be in a position to provide the required voice-network services across national boundaries because they simply do not have the development capacity to deliver the product and the service in the timescales required. By 1991 or 1992, businesses that use international telecommunications will be agitating for the European Commission and national governments to take some action. They will be suffering competitively with respect to the other power blocs — particularly, the United States and Japan. They will be suggesting that, in the same way as international managed data networks were legalised, international managed *digital* networks, for business use, should also be legalised. Then, international users would have the right to buy a full range of services from any of the competing suppliers. They will point out that, as the authorities have no way of policing the nature of the information that is carried across international managed digital networks (it is not possible to determine which is a voice bit, which is a data bit, which is a fax bit, or which is a telex bit), there is little point in legislating against it.

The Commission clearly feels that it has a duty to protect the provision of universal telecommunications services in member states, so major infrastructure competitors are unlikely to

be permitted. However, it does not seem to feel that it has a duty to protect an unproductive international communications cartel that is restricting major businesses. It is possible that the Commission and member states might force deregulation of international leased circuits relatively quickly, making no distinction between the type of information carried, whether voice, image, or data. Such a development would fundamentally change the opportunities that are open to major European business users of pan-European communications. It would offer them the possibility of going to a variety of competing service providers, who do everything except provide the basic national and international circuit capacity. That is an interesting challenge that the telecommunications administrations will have to face up to. Such a transformation could occur before the mid-1990s.

All these developments and possibilities mean that there is good news and bad news. The good news is that businesses will have a vastly improved choice as a result of the range of new products, new vendors, and relaxed regulations. The bad news is that these new choices will be available to them at a time when they do not have the resources to exploit them — when the skills are not available. The good news is that the systems integrators, the managed-network operators, and the vendors providing network-operation and management services can offer solutions that meet a real need. The bad news is that the provision of these services is perceived as undermining the role of those who actually procure communications services.

In summary, we have shown in this paper that changes in the way pan-European communications services are provided and used are inevitable. Foundation members need to accept that they must change the way they manage their use of communications facilities. In particular, they should consider contracting out some of the less business-critical functions traditionally carried out in-house. The key to success will be to manage that contract process, thereby enhancing the role that communications professionals can play in providing their organisation with a competitive advantage and with business success.

Butler Cox

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

Objectives of the Foundation

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

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 Australia, Belgium, France, Germany, Italy, the Netherlands, Sweden, Switzerland, the United Kingdom, and elsewhere.

The Foundation research programme

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

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