Customer Service Implications of Computer Convergence with Telecommunications

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CUSTOMER SERVICE IMPLICATIONS OF COMPUTER CONVERGENCE WITH TELECOMMUNICATIONS

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CUSTOMER SERVICE IMPLICATIONS OF COMPUTER CONVERGENCE WITH TELECOMMUNICATIONS

EXHIBITS

I INTRODUCTION

- For several years now the two areas of computers and telecommunications have been converging and, indeed, overlapping, as in the case of ICL's One-Per-Desk. This convergence is significantly impacting the data processing environment, and, consequently, customer support.

- Computing has moved steadily from a batch processing orientation towards a transaction processing orientation. The effect of this is not just to speed up operations, but also to make operators more critical and system failures more visible.

- For customer service, the implications are that system availability requirements will increase, in turn demanding faster response and repair times and improved product reliability.

- This increase in criticality must also be set against the background of squeezed service profits. The combination of decreasing (in real terms) maintenance prices, increasing cost pressures, and increasingly stringent user requirements is a scenario spelling potential trouble in any industry.

- This report seeks to identify the key challenges facing customer service as the convergence between the two industries continues.

II EXECUTIVE SUMMARY

- The convergence of computer and telecommunications technologies, although not receiving user acceptance as quickly as many manufacturers hoped, is nonetheless a fact of life.

  - A number of companies (Ericsson, Siemens, and NEC, for example) have been intimately involved with both technologies for many years.

  - Most other computer companies have recognized the need to have involvement in both camps either through acquisition or joint ventures.

- As with any major development in computing, convergence will have its impact upon service.

- One major development in the office automation area is that of the local area network (LAN). Here, views differ as to the current level of LAN penetration, but there is little doubt that it will be a factor with which service management will have to cope.

  - The impact of LANs, which can provide significant benefits to users, is a mixed blessing to service providers. On the one hand, by helping users to develop a total solution to their office automation needs, the LAN should stimulate hardware sales, hence future service revenues. On the other hand, increased sharing of expensive hardware may depress sales and service revenues.

- Multi-vendor environments connected via LANs will become an increasingly important corporate factor, and if manufacturers are not prepared to support and service other manufacturers' equipment, they may open the door to competition either from other manufacturers or independent maintainers.

- PTTs are becoming more knowledgeable about, and experienced in, the repair of computer equipment. Future product developments are likely to increase that level of knowledge and give the PTTs the technical ability to compete for network service revenues. They already have the infrastructure to enable them to attack the market, and most have the cash. Deregulation in Europe and expansion from the U.S. could stimulate a major move by PTTs into computer service in the future.

- Value-added network suppliers and facilities management companies have considerable experience of network design and operation. It is possible that in order to enhance the services they provide they will undertake consultancy, support, and maintenance activities for other networks.

- As well as providing business opportunities, convergence can also provide service managers with a number of new management aids to improve service performance and profitability.

  - Remote diagnostics.

  - Use of lap and handheld terminals to improve engineer productivity, speed up invoicing, and improve record-keeping.

  - Development of expert systems to allow the use of less-skilled engineers and improve fix times.

- Exhibits II-1 and II-2 summarise the opportunities and threats presented by the convergence of computer and telecommunications technologies.

EXHIBIT II-1

CONVERGENCE - THE OPPORTUNITIES

- Increased Revenues
  - Impact of LANs on Office Automation Leads to Higher Equipment Sales
  - Network Design, Installation, Consultancy, and Support
- Cost Reduction
  - Improved Remote Diagnostics
  - Reduced Inventory
  - Faster Billing; Lower Working Capital
- Improved Engineer Productivity
  - Time Control Systems
  - Diagnostic Assistance
  - Faster Fix Times
  - Use of Expert Systems

EXHIBIT II-2

CONVERGENCE - THE THREATS

- Falling Service Revenue
  - Increased Sharing of Peripherals
- Increased Competition from Independents
  - More Multi-Vendor Environments
- Emergence of New Competitors
  - PTTs (European and U.S. Bell Cos.)
  - VAN Suppliers
  - Facilities/Management Companies

III THE NATURE OF CONVERGENCE

A. CORPORATE CONVERGENCE

- Many companies have been active in both the computer and telecommunications sectors for some time. The last two years have seen a more positive drive to bring the two together.

  - Some years ago, NEC adopted the theme 'Computers and Communications' as its driving philosophy and used it in its promotional activities.

  - The breakup of AT&T in the U.S. has been instrumental in accelerating its drive into the mainstream computer market.

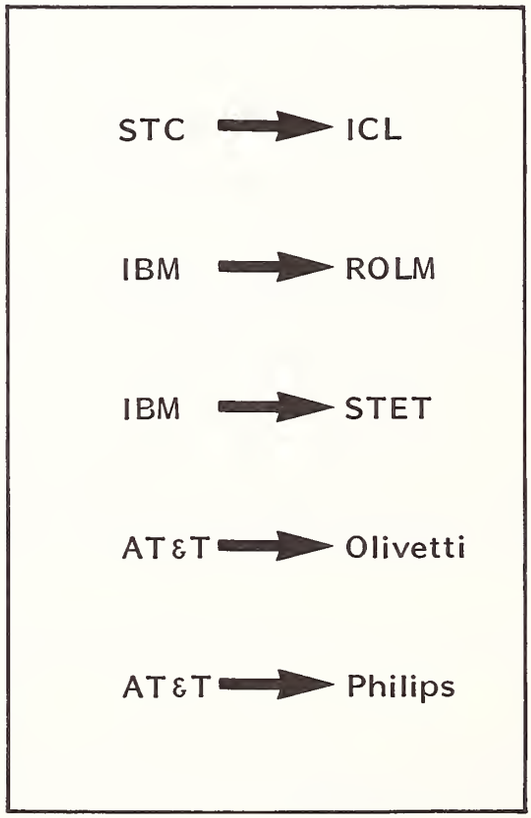
  - STC's takeover of ICL brings the two sectors firmly together in one camp.

  - IBM has also recognized the trend with their involvement with Rolm.

- These moves, summarised in Exhibit III-1, show the degree of importance that hardware manufacturers are placing on 'the other angle'. The ventures are not one-way traffic. Companies historically regarded as telecommunications-oriented have moved into the computer hardware area, while moving the opposite way, computer-oriented companies have migrated into telecommunications.

EXHIBIT III-1

CORPORATE CONVERGENCE OF COMPUTING
AND TELECOMMUNICATIONS



- Such a major shift in corporate emphasis will necessarily have an impact on customer service and support. Telecommunications-oriented systems may well place more stringent system availability, response, and repair time targets on suppliers and traditional telecommunications companies may have problems in becoming more system or application oriented.

- Takeovers and mergers are not the only route to bridging the gap between computing and telecommunications; joint ventures, such as those between AT&T and Olivetti and AT&T and Phillips, are valid alternatives. Joint ventures, however, do in the long term present the risk of conflict of interest, leading to corporate disharmony.

- End users are becoming increasingly data security conscious, and a proliferation of engineers visiting their installations is being seen as increasingly problematic. Bringing maintenance of both telecommunications and systems together holds out the prospect of reducing the number of engineers visiting a site and so increasing the level of data security.

  - This aspect is increasingly important in those countries where data protection legislation is in force; e.g., the U.K. and Sweden where DP managers are responsible for maintaining data privacy.

- Service companies, whether manufacturers or independents, who can offer service for both computing and telecommunications will have an additional element to offer in their sales mix.

B. TECHNICAL CONVERGENCE

- Significant technological advances, particularly in the area of chip technology, coupled with the erosion of telecommunications regulatory constraints

have helped to accelerate the blending of microprocessor-based telecommunications and computing products.

- The acceptance of the wide range of products emerging from this blending process has been slower than many manufacturers predicted or indeed hoped for.

- This product movement, allowing as it does the digitising of all forms of information (voice, data, and graphics), permits the transmission of information (in any format) between users along existing telephone lines or the use of specialist networks.

- As the existing humble telephone gives way to newer, more sophisticated products, such as ICL's One-Per-Desk or networked PCs with electronic mail and telecommunications capabilities, so, too, customer service will have to reflect this change.

- Possible scenarios facing service organisations are:

  - More widespread equipment (almost literally on every desk), creating severe logistics problems for service providers.

  - Increased criticality of the equipment. There is generally a significant difference between the criticality of a PC on an executive's desk and his telephone. When the two are merged, the more demanding service criteria will be expected by users. This could lead to users demanding higher levels of system availability and faster response-to-repair time for low-value equipment.

- It is possible, therefore, that service vendors could be caught in a profit squeeze by having to commit more resources to supporting low-revenue-generating equipment. There may also be a temptation for users to rely on 'on-demand' service rather than taking out service contracts. This should be resisted as far as possible.

- Users must be made aware that the value of service relates not to the initial cost of the hardware, but to the importance of their hardware to the enterprise. In this way, vendors could increase the service price relative to hardware price.

- Vendors should also try to maximize the number of users taking service contracts, thereby capitalising both on the increased volume of product being shipped and the increased reliability of that equipment.

- The power of the telecommunications/computing link has encouraged users to begin thinking of their information systems as a valuable corporate resource which can provide a competitive advantage in the marketplace. Some market sectors, notably banks, financial institutions, and the travel industry, have been quick to grasp the opportunity. In the future, retailers and distribution companies are set to exploit this concept.

- Again, this trend has the double edged implication for customer service. On the one hand, users will be demanding higher levels of system availability, but because of the importance of their information systems, they should be prepared to pay a higher price for its service.

C. FUNCTIONAL CONVERGENCE

- The development of network technology allows users to bring together the three main areas of corporate information systems.

  - Data processing, covering the major applications areas of payroll, financial systems, manufacturing control systems, and distribution systems.

- Office automation, covering word processing, telex, electronic mail, and videotex.

- Decision support systems, mainly financial modelling.

- For full integration, there is also the provision of mainframe links (see Exhibit III-2).

- This merging of once discrete activities will impact the nature of service to be provided. Engineers will have to operate in office environments as well as the computer room and will be in more day-to-day contact with customer management.

  - In other words, the service engineers will have an increasingly high profile with customers.

  - Vendors must ensure that working practices and engineer communication skills reflect this new environment.

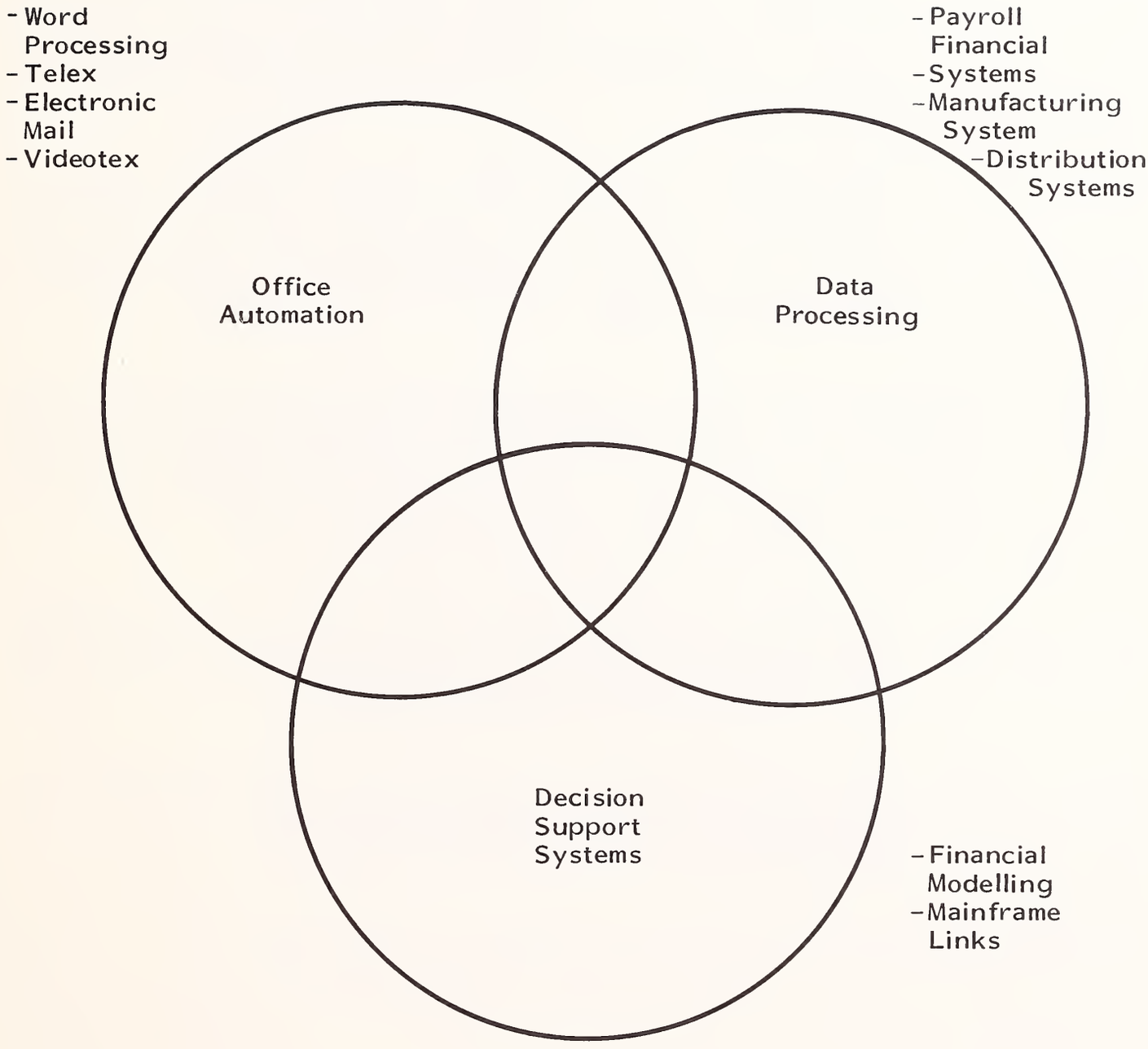
- The new users are also more likely to be 'computer illiterate' and more applications-oriented rather than 'machine-oriented'. It is important, therefore, that engineers understand the wide system implications of faults, both hardware and software.

- The role of software, both systems and applications, also becomes more problematic, with many users possibly unable to determine precisely where a fault lies and so making more demands on the service organisation.

  - It is important that clear lines of communication between the user and the service vendor are established. This may involve setting up a 'filtering process' within the vendor organisation or the nomination of a controller or troubleshooter within the customer organisation.

EXHIBIT III-2

FUNCTIONAL CONVERGENCE



Integrated Functions Via a Network

- This problem become even more acute for the end user when operating in a multi-vendor environment. One of the most frequent criticisms which users level at service vendors is that there are frequently attempts to pass on the blame for a failure--'finger-pointing'.

- Vendors therefore have both a problem and an opportunity.

  - The problem is that to keep good customer relationships they should not indulge in trying to pass the blame in the first instance to another supplier. To avoid doing this, however, can be both time-consuming and expensive.

  - The opportunity exists for vendors to extend the range of equipment supported to encompass that of other manufacturers and so generate new revenues. This approach would also help to overcome the security problem discussed earlier.

- As more functions become networked, there is, in the long term, potential for moving operators out of central office locations to their own homes. To allow for this development, service vendors will have to be able to provide a universal geographic coverage, very much as the PTTs do now.

  - Alternative service approaches will have to be developed, particularly the provision of multi-vendor, local service centres offering fast repair, possibly with equipment loan facilities.

  - There may also be scope for regional support centres where users can work while their own machine is being repaired.

IV LOCAL AREA NETWORKS AND SERVICE

- Local area networks (LANs) are a fast-growing feature of today's business environment. A recent report in the Financial Times suggested that some 70% of the Fortune top 5000 companies will be using LANs by 1986.

- INPUT's own research in the U.S. indicates that 70% of companies planning to install new PBX equipment are also planning to integrate voice and data communications.

- There are several key characteristics of a LAN; typically, as summarised in Exhibit IV-1, they:

  - Are owned by a company and therefore not subject to PTT regulations.

  - Can integrate data processing, electronic mail, imaging, and voice communications using various types of equipment from a range of vendors/manufacturers.

  - Are high-speed communication paths with speeds ranging from 500 K bps to over 1 billion K bps with fibre-optic cabling.

  - Should be able to support full connectivity with every device being able to communicate with every other device.

EXHIBIT IV-1

LAN FEATURES

- Not Restricted by PTT Regulations
- Integrates Range of Devices, Applications
- Can Bridge to Other Networks
- High-Speed Communications Pathway

- May be able to connect with other similar LANs or have gateways to dissimilar networks.

- The user motivation for using LANs is, in theory, a rational one as utilising LAN technology can provide a number of important benefits (see Exhibit IV-2). The main reasons are:

  - Relatively low entry cost for new users. Additional stations can be made for around $800.

  - Easy growth path for users of network-compatible equipment.

  - Improved data utilisation. Sharing access to a common data base can help to overcome many of the problems encountered in large centralised systems.

  - Improved peripherals utilisation. By linking equipment via a network, relatively expensive peripherals, such as printers or hard disk drives, can be shared by a number of users. Individual peripheral usage often leads to significant 'idle time' of the equipment.

  - Improved productivity. People are able to concentrate on solving the real business problem and do not have to spend so much time on 'nonproductive' work.

  - Use of networks enables the information systems manager (or his equivalent) to control the PC usage standards within the company. Many large corporations have suffered from 'PC blight' over the years, and the discipline associated with network usage can be a valuable side benefit.

  - Because data can bypass faulty equipment and users can run their applications from any port of the network, there is inherently greater

EXHIBIT IV-2

WHY LAN?

- Low Entry Cost
- Easy Growth Path
- Improved Use of Resources
  - Data
  - Peripherals
  - People
- Control of PC Use Standards
- Resilience
- Improving Return on PC Investment

resilience. Key control equipment, however, has a correspondingly greater degree of criticality associated with it.

- By optimising the use of data, peripherals, and people, computer users will improve the return they achieve on their PC investment.

- Exhibit IV-3 elaborates on the ways in which users can improve the return on their PC investment. A major benefit of networking PCs is to increase total system benefit while retaining the 'personal' nature of the PC.

  - Access to electronic mail facilities, although rarely quoted as a reason for networking, is often one of the first applications to be run.

  - Access to external services is also important. The 1980s and 1990s will be, or are, the information age, and the transfer of information, both internal and external, will be vitally important.

- The growth of LANs presents a number of opportunities for service vendors, but also poses some threats. Among the threats to service, particularly service revenues, are:

  - Equipment, such as workstations, word processors, printers, and FAX machines, being shared among work teams, so requiring lower inital capital expenditure and lower recurring service cost--hence lower service revenue to the vendor.

  - In the longer term, this trend could erode the installed equipment base with individual units being replaced by shared networked units, further increasing the pressure on maintenance revenues.

- On the other hand, the lower entry cost and greater benefits to be gained from networked systems may prove to be a stimulus to the market and more equipment may be sold overall. The availability of a total solution makes the

EXHIBIT IV-3

IMPROVING RETURN ON PC INVESTMENT

- Networking Can Improve the Overall Benefit of Having PCs While Retaining the Personal Nature of the PC
- Access to Electronic Mail
- Sharing Expensive Peripheral Devices
  - Printers
  - Disks
  - Tape Back-Ups
- Access to Sharing External Communications
  - Telex
  - Telephone
  - Viewdata Services

move to office automation more attractive. Exhibit IV-4 highlights this dilemma.

- Vendors generally feel optimistic about the future, and while recognizing the downside risk, are looking for higher service revenues through increased sales of office automation equipment.

- The move toward LANs itself provides service revenue opportunities as shown in Exhibit IV-5. There are several activities associated with LAN implementation which can be capitalised upon by service vendors.

  - Users are probably unclear about the best type of network for their purpose and will require help in overall network design. This can be provided free by the network vendor or on a consultancy basis by an independent service organization.

  - Users will have to be trained to use the network as well as the individual application programs. As the user base widens, the scope for training increases. This could be developed into a significant revenue generator.

  - The physical installation of the network must provide potential. Holes must be knocked in walls, cables laid, and equipment connected.

  - The network must be maintained and kept up-to-date once installed. There could be new nodes to add on a regular basis and, in the future, major cable renewal to take advantage of fibre-optic technology.

- There is a danger that companies considering using networks will also consider self-maintenance for various components of the network, or indeed, the total network.

EXHIBIT IV-4

THE LAN - MARKET DEPRESSANT OR STIMULANT?

Stimulant	-	Provides Total Solution
	-	Makes Office Automation Attractive
	-	Triggers Higher Hardware Sales
	-	Develops Higher Service Revenues
Depressant	-	Facilitates Sharing Resources
	-	Reduces Demand for Hardware
	-	Hardware Installed Base Erodes
	-	Service Revenues Decline

EXHIBIT IV-5

SERVICE OPPORTUNITIES IN LAN

- Network Design
- User Training
- Consultancy
- Installation
- Maintenance
- Overall Support

- One motivating factor for this is the absence of an overall, single, maintenance service provider. Users do get annoyed and frustrated with service vendors 'finger-pointing' or blaming others' equipment and/or service.

- To combat this possibility, vendors must become more familiar with network components and operations, even if the equipment is from several different suppliers.

  - Principal maintainers will have to learn other elements in the system to be capable of diagnosing the correct problem when one exists.

- There is resistance among some principal maintainers to assuming the responsibility for service of equipment not built or marketed by them.

  - This resistance along with the demand for sole-sourcing provides a major opportunity for independent maintenance companies who are prepared to service a wide range of equipment.

- Users are interested in efficiency and control, so an opportunity exists for a vendor to help the network user reduce the number of service interfaces within the network. There are two different ways in which this opportunity can be exploited.

  - The network manager approach--here, the user is only aware of a single maintainer or service manager. This service manager can subcontract service back to the original manufacturer or a third party. The convenience should be worth a premium price to the network user.

  - The other approach would be for the principal maintainer (or any other maintainers in the network) to actually learn to service the other products, again for a premium of course.

V IMPACT OF VALUE ADDED NETWORK VENDORS

- Value added networks (VANs) are becoming an increasingly important element in the information age. Companies like the General Electric Information Service Company generate high revenues from these services.

- Many large organizations have established in-house corporate networks, and many more will seek to do so over the next few years. This development, possible because of new technology, will create a demand for network service knowledge.

  - Corporate networks must be designed, established, and maintained to the highest possible standard as organisations beome increasingly dependent upon their communications systems. In a highly competitive environment, such as foreign exchange dealing, communications reliability is paramount in importance.

- This situation will create a demand for personnel with both computer and telecommunications expertise and experience--at present a rare commodity. One possible development for this scenario is the diversification of network specialists and facilities management companies, such as EDS, into hardware maintenance. If they are able to provide all the other services that the customer needs, they may wish to also provide hardware maintenance so that they can offer a truly 'complete service'.

VI THE IMPACT OF PTTs

- When considering the convergence of computing and telecommunications, it is impossible to ignore the role of the PTTs, especially in Europe where the activities of national PTTs can play a part in the development of communications networks.

- Use of local area networks is generally free from any interference from the PTT. The story is very different, however, when companies wish to communicate across a wider area. The position generally in Europe is for strong PTTs, usually monopolistic, who can dictate the manner in which data, speech, and images are transmitted across the public network.

- At a European level, there is little evidence of a desire to ease the path for easy transmission of data. In fact, on occassion, the opposite seems to be the case. However, there appears to be little that the PTTs can do to prevent companies from transmitting/receiving data.

- The recognition that transmission volumes will grow and the move toward digital systems have stimulated the current and future operators of telephone exchanges.

- From the service point of view, the PTTs could emerge as a very real threat to traditional computer service companies. The 'convergence' of the two technologies is providing telephone service engineers with computer service experience.

- The engineers PTTs have in the field could be utilised to provide computer service. The PTTs have access to virtually every business premise in Europe.

- Increasing exposure to and experience with servicing mainstream computer equipment could make the PTTs a real threat in the marketplace.

- There is evidence from the U.S. that telephone operating companies are beginning to enter the independent computer maintenance market. Their strong financial position, extensive engineering coverage, and access to a wide client base makes them a very real threat in the market.

  - Bell Canada's move into European third-party maintenance by acquisition emphasises the fact that the Regional Bell Operating Companies cannot be ignored, even on this side of the Atlantic.

- Where PTTs are subject to strong governmental control, their freedom of action may be severely restricted in that they are able to operate only within their defined terms of reference. As deregulation occurs, as in the United Kingdom for example, then the threat becomes more real, although not necessarily more immediate.

- Exhibit VI-1 summarises the potential impact of PTTs.

EXHIBIT VI-1

CONVERGENCE - PTT AND SERVICE

- PTTs a Potential Threat to Traditional Maintainers:
  - Aquiring Computer Service Expertise
  - Comprehensive Geographic Coverage
  - Access to Immense Customer Base
  - Often Cash-Rich
  - Some Seeking to Diversify
  - Threat from US Bell Cos.
  - Effect of Deregulation in Europe

VII CONVERGENCE AND INDEPENDENT MAINTENANCE

- One of the major side effects of convergence, the increasing use of LANs, is also resulting in an increase in the number of multi-vendor sites containing low-value equipment.

  - Typically, these PCs, disk drives, printers, and word processors from various manufacturers could be linked into a single network.

- The reluctance of some manufacturers to support 'alien equipment', the need for users to have fewer service interfaces, and the willingness of independents to tackle this valuable market all point to the potential of networks as a marketplace for the independent maintainers.

- Those manufacturers, such as Olivetti, who are agressively targetting the service of other manufacturers' equipment will also be in position to make a significant impact in this area.

- As has been said earlier in this report, users are becoming increasingly anxious to reduce the number of service interfaces with which they have to deal. The need may well reduce the natural relationship between the seller of the equipment and the maintainer of that equipment.

  - The important factor for the user will be to select the service organisation which is both willing and best equipped to keep the network and its component resource at a maximum level of availability.

- This approach does not, of course, exclude in any way the prime equipment manufacturer, but it does potentially open the door to competitive service organisations. To ensure that these competitors are frozen out, manufacturers must be prepared to undertake the service of 'foreign equipment'.

VIII CONVERGENCE AND MANAGEMENT

As well as providing market opportunities and threats, the convergence of computer and telecommunications technologies can produce benefits for service management in the shape of improved engineer producitvity.

- Computerisation in service administration is extensive for large companies, less so for small and medium companies. Most of the applications are centralised, covering invoicing, financial control, data management, and call handling.

- Remote diagnositcs, despite strong user resistance, is a potential application which can improve engineer productivity, improve customer satisfaction, and potentially reduce inventory holdings.

  - INPUT's 1984 annual report on customer service in Europe estimated that repeat calls and no-fault-found calls accounted for almost one visit in four to a customer site. Effective use of remote diagnostic techniques may be a valuable aid toward reducing this wastage.

- Developments in lap-top or handheld computers can also be harnessed by customer service management. Among applications which could prove valuable are:

  - Engineers' time control.

  - More detailed, real time field reports.

- Same-day invoicing, reducing working capital.

- More accurate inventory records, leading to reduced inventory holdings.

- On-line fault report interrogation to speed up fix time.

- All these applications can help to optimise the use of that all-too-scarce resource, the experienced engineer, and to improve overall service profitability.

- In the longer term, development of expert systems held centrally but accessed from a remote location by an engineer could provide additional benefits.

  - Reduced need for highly skilled engineers as the experience can be accessed on-line by less qualified personnel.

  - Faster fix times as fault diagnostics is made easier.

- The benefits of convergence to customer service management are summarised in Exhibit VIII-1.

EXHIBIT VIII-1

CONVERGENCE - A SERVICE MANAGER'S ALLY

- Harnessing Computer and Telecommunications Technologies Can Provide:
  - Improved Remote Diagnostics
    - Fewer Report Calls
    - Fewer No-Fault-Found Calls
  - Comprehensive Engineer Time Control
  - Improved, Faster Field Reports
  - Same Day-Invoicing
  - Up-to-Date Inventory Records
  - On-Line Fault Report Interrogation
- In the Future:
  - Use of Expert Systems
    - Lower Skill Levels Required
    - Faster Fix Times

About INPUT

INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Continuing services are provided to users and vendors of computers, communications, and office products and services.

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff members analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs. Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

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Formed in 1974, INPUT has become a leading international planning services firm. Clients include over 100 of the world's largest and most technically advanced companies.

Offices

NORTH AMERICA

Headquarters
1943 Landings Drive
Mountain View, CA 94043
(415) 960-3990
Telex 171407

New York
Parsippany Place Corp. Center
Suite 201
959 Route 46 East
Parsippany, NJ 07054
(201) 299-6999
Telex 134630

Washington, D.C.
11820 Parklawn Drive
Suite 201
Rockville, MD 20852
(301) 231-7350

EUROPE

United Kingdom
INPUT
41 Dover Street
London W1X 3RB
England
01-493-9335
Telex 27113

Italy
Nomos Sistema SRL
20127 Milano
Via Soperga 36
Italy
Milan 284-2850
Telex 321137

Sweden
Athena Konsult AB
Box 22232
S-104 22 Stockholm
Sweden
08-542025
Telex 17041

ASIA

Japan
ODS Corporation
Dai-ni Kuyo Bldg.
5-10-2, Minami-Aoyama
Minato-ku,
Tokyo 107
Japan
(03) 400-7090
Telex 26487

INPUT®
Planning Services For Management

INPUT®
1943 Landings Drive, Mountain View, CA 94043, (415) 960-3990