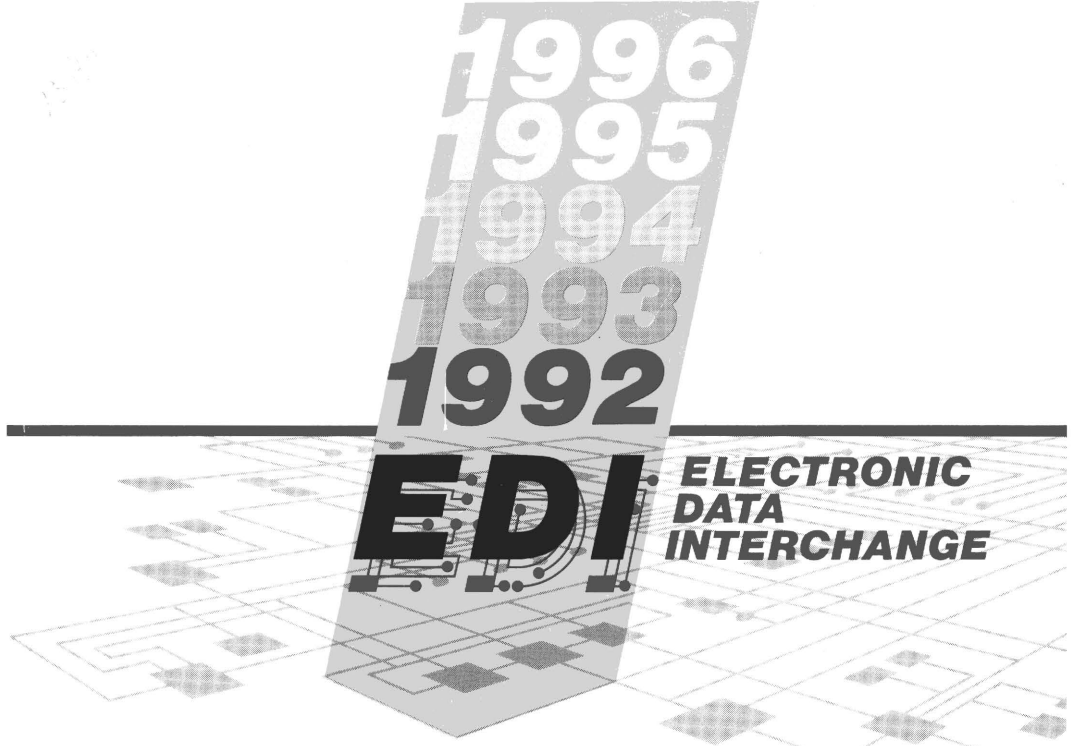

EDI-1992 AND BEYOND

CONFERENCE PROCEEDINGS

BRUSSELS
September 1989

ECONOMIC AND
SOCIAL COMMITTEE
OF THE
EUROPEAN COMMUNITIES

ELECTRONIC
DATA
INTERCHANGE

EDI-1992 AND BEYOND

CONFERENCE PROCEEDINGS

BRUSSELS
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Note:

The texts reproduced in this document are condensed versions of the speeches actually given at the Conference.


EDI


ELECTRONIC
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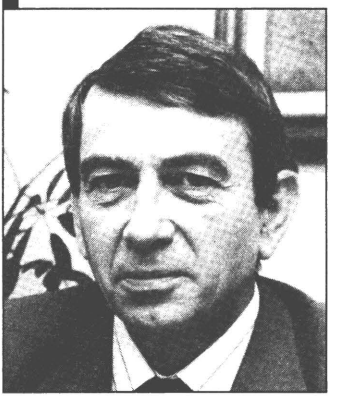
CONTENTS



Jacques MOREAU,

Secretary General
of the Economic and Social Committee of
the European Communities

FOREWORD

When the International Data Exchange Association (IDEA) approached the Economic and Social Committee to ask for help in drawing attention to the wider implications of Electronic Data Interchange (EDI), the Committee was glad to have the opportunity to confirm in practical terms its support for EDI which had already been expressed in its Opinions on the Community's TEDIS programme.

Both the Association and the Committee feel that the debate on Electronic Data Interchange has been for too long a debate amongst technicians, concentrating on data and message standardisation, and that the time has come to widen the issues under discussion and for persons not directly involved in EDI to take part.

The Economic and Social Committee, as the Community forum for a wide range of economic and social interest groups, therefore took the initiative to organise a conference which took place in the month of September 1989.

EDI will be one of the many ways in which new technology will contribute to achieving the Community's internal market. However, EDI is also a global phenomenon with important economic, social and legal consequences.

In publishing these proceedings the Economic and Social Committee hopes to make a significant contribution to a debate in which it intends to continue and strengthen its role.

Jacques MOREAU

Secretary General

INTRODUCTION:

The Internal Market and EC policy for EDI

Aldo ROMOLI

Chairman of the Section for Energy, Nuclear Questions and Research at the Economic and Social Committee (on behalf of the President, Alberto MASPRONE)

What are the views of the Economic and Social Committee as regards 1992 and the Development of EDI ? The Committee has, from the outset, been firmly behind the Commission in its support for the 1992 programme and has given every encouragement to research programmes like TEDIS, which is designed to develop and strengthen EDI trade systems.

Two examples may be quoted on progress made in EDI :

The first is the European automotive industry, whose system known as ODETTE has brought together the major names in that industry within a system which permits supplier and purchaser to communicate directly. ODETTE has developed bar coding labels to help identify actual goods with electronic messages. Studies are also progressing in the exchange of engineering information.

The second example is provided by the European Council of Chemical Manufacturers' Federations (CEFIC). CEFIC is a European organisation representing 15 national chemical federations in Western Europe, with some 39 major companies as corporate associate members. CEFIC's EDI project was based from the outset on elements such as the coding of messages, orders and invoices and international data exchange. It was discovered that 70% of one company's computer input had been, at some stage, another company's computer output. So, coupled with the obvious savings in time and handling costs, it must make sense to link the computers rather than to separate them by forms and letters.

The CEFIC project also drew attention to some of the legal problems that have to be solved before EDI can become the normal method of communication between companies. Most of the law of contract in the countries of Europe has grown up around the structure of the letter which places an order for the goods - the offer, and the letter which agrees to provide those goods at a set price - the acceptance. Will the law uphold a contract made between two computers ? Must we wait for all these problems to be settled by case law in the different EC Member States, or is there some short cut to speed up

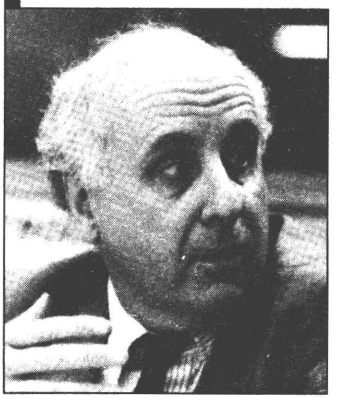
the development of the legal side of EDI ? It is vital to the expansion of EDI systems that we get clear answers as to the legal problems involved.

The examples of ODETTE and CEFIC are indicative of how the major industries of Europe are already thinking in terms of a business environment based on EDI. But what of the smaller industries ? Does EDI mean that the gap between big and small will become unbridgeable ? Will the small business be able to acquire information systems adapted to the needs of international business, as well as to their own specific local needs ? These are some of the questions that we shall have to face if we have the prosperity of all types of business in mind.

Concerning the development of the internal market which is the backdrop to this conference, Mr DELORS has been quoted as saying "you cannot fall in love with an internal market", but the fact remains that the internal market which will take shape between now and 1992 is uppermost in the thoughts not only of European businessmen, but also of their American and Japanese counterparts. EDI together with the dynamism of the internal market could contribute to the revitalisation of European business and bring us a level of prosperity as yet unknown in our continent.

What about the social dimension of the internal market ? The development of EDI has relevant implications for the social dimension, for of course it cannot be considered only in terms of technical and economic consequences, since it will also have effects on individual citizens, both consumers and workers. This social aspect of EDI should be examined very carefully, especially as regards the perspectives of social advantages, education, training of workers, employment and the delicate aspect of the confidentiality and privacy of the information and messages passed.

If we really are confronted by a revolutionary breakthrough in communication systems, we have to take account of the social dimension of changes in the organisation of work and of the far-reaching consequences of such a perspective.



Viscount Etienne DAVIGNON,

Chairman of the Société Générale de Belgique

I asked myself what contribution I could make to your discussions. I said to myself that perhaps it was the vision of someone involved in business, who did not belong to the generation of those who have grown up with the computer, who was convinced that data processing was part of a natural development without being very sure that he could master it himself and who wondered what really happened in practice.

I discovered a number of paradoxes. The first is that there is a well-established and accepted truth according to which the introduction of the computer into the everyday world of business saves money, time and staff. These three affirmations are wrong. In fact, the introduction of the computer into businesses opens up a prospect of action which, in terms of quality is unbelievably greater than that which existed before, yet only a very small part of this potential is used in real terms.

The second paradox is that small businesses are often more aware of the qualitative benefits of the computer and information technology generally than large businesses. This is because small firms are more capable of appreciating the boost given to their activities by data processing than large firms which, to some extent, are already able to perform a wider range of services even without computers. For them, data processing is a question of efficiency, not a question of whether something can or cannot be done.

The third paradox is that as technology develops, traditional services deteriorate. Today a letter takes one and a half times as long to arrive at its destination as it did before the Second World War, while afternoon deliveries have disappeared.

Considering the potential of available technology, there is, as yet, no reaction, no sign of an unsatisfied need. This clearly shows that we are not yet familiar with this technology. For instance, in banking everyone agrees that one day it will be possible to carry out banking transactions from one's home. The technology necessary is not particularly complex and a reasonable level of security can be assured. But the problem is one of a monopoly involving the

State and private carriers. And there is much hesitation about making major investments in order to change the system because of doubts about how the public will react and because of the turmoil involved for banks' organisational structures.

Technology must be matched to real needs. If technology can accomplish something which is not felt to be a real need, there will obviously be a delay in implementation.

On the other hand, once a need is felt, events will follow. Real-time stock management saves businesses a lot of money. All firms which want to be efficient have set up a real-time stock management system, which requires the cross-linking that is to be discussed. Nowadays no large distribution chain could satisfy the various needs of its customers in real-time unless its computers were cross-linked. Without cross-linking it could only be aware of a change in customers' tastes when such tastes have already changed. The ability of getting successful goods which have sold out to a large number of shops in two days, which is vital in order to follow up an initial success, is only possible by using new technology.

But when such a need does not make itself felt so intensely, we again clearly face a structural separation between the world of the computer and the world of the user. Of course, things are not so bad as this, for in the fields of financial services, insurance and banking, the data processing system, the management of information and the cross-linking of information will eventually become the basis of the trade, with software and technology becoming simply the means by which needs are satisfied.

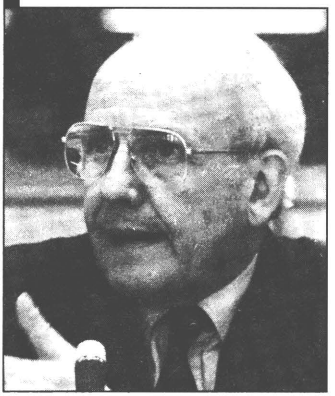
But we have not got to that stage yet. We are now at the stage of demonstrating what the new systems can do technically without yet realising that this technical demonstration is only the basis for a need that will emerge elsewhere. The fact is that business executives have not yet realised that it is easier to push a button to find out what messages there are on a screen, they prefer to have a big heap of papers in which the paper they want is not necessarily rapidly available. That is the world they are used to. So the improved way of doing things which electronics has made possible within a firm has not been seen as a need at all. On the contrary : it can be introduced because it seems the modern or up-to-date thing to do, but not because it is useful. Many of my colleagues have screens, but I have the most serious doubts about whether they are used very much; and if they were sold off I am quite sure they would be the best secondhand bargain anyone could wish for, as they are brand new.

Now I should like to turn to the legal side, which is obviously an extremely serious problem. What is the value in contractual terms of anything that can be done using such methods ? This is a very important problem and our types of civilisation are lagging way behind here. For in all our countries, if a legal document is not registered by a solicitor, it is simply not registered. I do not

know whether many of you have ever registered legal documents : the only thing I can say is that they do not make much use of modern technology. I am saying nothing against solicitors, that is the way things are done. Such documents still have to be read through completely in front of general meetings if they are to be considered as valid.

So, a very big effort still has to be made to assess what technology can do and use it to satisfy needs which have been identified. Such a move will, of course, change everything, because future generations will have got used to handling such tools. But we are not there yet.

Many countries are not there yet, certainly in Europe. So this type of conference should also take account of the need to educate and explain; otherwise we shall continue, to our great cost, to have an electronic structure which is up-to-date but whose capacity utilisation is out of all proportion to the vast amount of training and investment which has to be carried out in order to make use of it.



Filippo Maria PANDOLFI

Vice-President, Commission of the European Communities

THE R&D FRAMEWORK PROGRAMME

At the beginning of the 1980s the Community considered that it was absolutely essential to tackle the real problems of our day and age by focussing attention on research. One example of this new dimension was the ESPRIT programme. The information technologies sector is in fact a continuum ranging from the infinitely small (by which we mean micro-electronics) to major systems and advanced telecommunication networks.

The Community's own involvement reached an important stage when the Single Act was adopted. Article 6 of this Act gave the European Community a legal instrument which was more powerful than the Treaty Article 235 on which new policy was originally predicated. Under the Single Act, research and technological development policy has been brought within the compass of some major new Community policies. This is the background to the existing research and technological development framework programme (1987-1991).

The proposal for the new 1990-1994 framework programme which has been submitted by the Commission is linked to the existing framework programme by a system of rolling programmes and is more developed in terms of both substance and funding. Between the early 1980s (when the first tentative ideas were aired) and the present day, the Commission has built up a series of coherent projects. Yet only now is the Council being asked to examine the ambitious framework programme for 1990-1994.

The current framework programme is reasonably generously funded, namely to the tune of 5.6 billion ECUs over a five-year period. It breaks down into a number of specific programmes, some of them covering the information technologies and telecommunications sector (RACE). In the new framework programme there will be specific programmes within a small number of strategic areas. There are currently 37 specific programmes in operation but in the future framework programme there will be only six. The first is entitled "information technology and telecommunications". The reason for this is to

ensure real flexibility (small programmes tend towards spatial and temporal rigidity) and also to be able to pursue more ambitious goals than were possible under existing programmes.

Micro-Electronics : the JESSI Project

The new ambitions range from the production of the infinitely small in one direction to the creation of large-scale systems in the other. As far as the infinitely small is concerned, the European Community has had to take some very difficult decisions since Europe now retains only a tenuous foothold in micro-electronics, i.e. in the manufacture of memories, chips, micro-computers and semi-conductors in general. In the micro-electronics sector there are only three European firms still operating in the market-place : PHILIPS, the market leader and 10th micro-electronics producer in the world, with a turnover of 1.8 billion dollars last year; THOMSON (Franco-Italian), with a turnover last year of 1.2 billion dollars (13th place); and SIEMENS, with a turnover last year of 0.8 billion dollars (17th place). The problem therefore was to decide whether to remain in the micro-electronics sector or abandon it. There was also a philosophical problem, i.e. the question of industrial strategy since users see memories, DRAMs, etc. as the raw materials of our time and wish to be able to buy them in supermarkets at very low prices without regard for their geographical origin. Finally, after going into the question more deeply, the users and the Community were convinced that a European presence in the micro-electronics sector was needed. This led to the EUREKA 127 project. The decision was taken to join JESSI and this has been successful in bringing manufacturers and users together to avoid risks to both parties. The first strategy of the new framework programme thus reflects a Community commitment to pursue a microelectronics strategy. The objective of JESSI is clear : to achieve 64 megabit chips and memories. At present the stage has been reached between 4 and 16 megabits, 16 megabits being the goal of the next stage. The time interval between generations, however, is very short (only three years) even if we are at the limits of molecular technology because the etched circuit path of the megabit chips will be 0.3 micros. So much for the infinitely small end of the spectrum.

A "Nerve System" for the Community

There are ambitions in many different directions and one wholly new development which has taken place in the last few months is namely the Community commitment to information technologies and telecommunications made in the third chapter of the first strategy of the framework programme. The commitment revolves round the realisation of a major Community EDI programme, to be executed partly outside the framework programme and under the responsibility (including financial) of the Member States. The programme primarily concerns EDI between the information systems of government departments in the EC. It stemmed from the reali-

sation that the free movement of persons by the end of 1992 will not be achieved unless links have first been established between government departments in the 12 Member States. What are needed are "operational" interconnections between police administrations, the judiciary and other departments since there are still major difficulties in achieving the apparently very simple goal of removing physical barriers to the free movement of persons.

It is also vital to link up information systems (electronic and computerised systems, as well as social security administrations) so that a person's status (social security rights and conditions) can be followed up consistently when he moves from one country to another for work purposes. The same holds for the very difficult area of immigration which requires a data network so that the situation can be continually monitored from a Community rather than a national point of view. Starting out from this line of reasoning the idea was conceived of what the French call "technologies structurantes" or "réseau structurant" and what some other people tend to call the Community's "nerve system". This "nerve system" concerns not only administrative matters but also the business world. There is a strategic and urgent need for major networks interconnecting firms in different fields.

From an economic point of view the goal is obviously to find ways of running a business efficiently and this can be facilitated by a general improvement in our society and in the way we work and organise ourselves. EDI is therefore of general interest as well. Society has to be looked at from the inside if the necessary changes under controlled conditions are to be made. This ambitious programme to link up information systems is now part of the official Commission proposal to the Research Council of Ministers.

Standards and Networks

Whilst developing the research policy and establishing interconnections and "technologies structurantes", the Community has an important political and legislative responsibility to harmonise technical standards. Without them it will not even be possible to have a "réseau structurant". Technical standards need to be chosen carefully as the roads to harmonisation and liberalisation have to be trodden together. Telecommunications have a long history behind them and only recently have national post and telecommunication offices, for example, begun to be broken up. National governments in fact tend to regard such areas as an extension of their sovereignty. This explains the fierce resistance when it comes to deciding what are "exclusive" or "protected" services. Naturally there are sectors which still need to be protected for reasons of security and because the vital interests of Member States are at stake, but there are also sectors which ought to be liberalised. In other words, liberalisation has to be carried out in harness with harmonisation, which is no easy task. One of the major responsibilities of the Community therefore is to make sure that progress can be made on both fronts at the same time.

Finally, the Community has set iself an historic objective, namely a large single market to be followed by Economic and Monetary Union. But there is a political and psychological risk in imagining that it is the instruments themselves which can bring about the desired results. For example, there is a tendency to imagine that the mere fact of having a large single market will bring about the gains described so vividly in the Cecchini Report, i.e. extra jobs and an unexpectedly large increase in GDP. This is a mistake and it would be a mistake to think that the consequences of EMU are inevitable. The same is true for the business world where there is a big risk of disappointment if there is no international network permitting national enterprises to think "European" and creating the necessary conditions for mergers and the improvement of overall productivity. These initiatives are very important because they tackle the root causes of problems and do not just look to the creation of major systems.

EDI: AN UPDATE

Alfredo SARICH,

Secretary-General of the International Data Exchange Association

AN UPDATE ON EDI IN 1989

World-wide, more than 15,000 industrial leaders have already begun to use EDI. These leaders will necessarily involve thousands of others, small and large suppliers, customers. Projections suggest that more than half a million companies will use EDI in the world by 1998.

It is not necessary to start big to do EDI, it can start bit by bit, piecemeal, department by department. As understanding, appreciation and experience grow, EDI can involve other partners, other customers, and continue from there.

EDI is cooperative. It requires the involvement of at least two partners but probably many more; EDI is like making love, there is no fun if you do it on your own. As such, EDI requires cooperation with suppliers and customers, with competitors and also, to be effective, within the same company and all its subsidiaries.

This aspect of cooperation sometimes disturbs companies : in the '70s and '80s, to share experience with competitors was a mortal sin, today things are changing. Here in Brussels the Commission has set a trend with its cooperative research programmes such as RACE and ESPRIT. EDI will, in years to come, accelerate this trend, and in this context EDI must be taken for what it is. Initially it may be a competitive tool; those who have it will gain from its use and from the new discipline that it imposes. Later, it will still be perceived as a critical tool but will no longer be considered a competitive tool. Competition will then have shifted to new levels : management, product quality and effective workforce for example.

The electronic telecommunication network, upon which EDI will travel, will become the equivalent of today's postal system used by all.

EDI is innovative. It progressively and inevitably changes the way things are carried out within an organisation; it introduces a new philosophy and a new approach to business.

Introducing EDI is not quick. For small companies that want to get into EDI it may take a few days, they accept to join an existing network and abide by the data transmission and message conventions defined by that network. Others may find it more difficult and a lengthy process, involving reconversion of internal procedures, negotiations with trading partners, agreements with network operators, training and retraining of personnel. This process of adjustment may take weeks and months for medium companies, and years for those large ones that already have systems and computers in place.

EDI is justifiably costly. Arguments vary on how much EDI really costs - from a few thousand dollars for the small company to the several thousands and millions for the large one. But, of course, major financial benefits arise from the streamlining of documentation in-house, the faster cash-flow, the lowering of stock levels, the sharp reduction in reporting errors, the improved employment of fleets, and the consequent lower charges attributable to your insurance and banking costs, etc.

EDI is irresistible. Not only because EDI puts firms on a par with their competitors, but because EDI produces long term benefits with increased efficiency.

To be in business in the year 2000 means to use some form of electronic data interchange. EDI may change in the next decade, different rules and standardisation processes may be adopted, but whatever may happen, the technique is here to stay and will be increasingly used.

The US Department of Transportation has said that "we simply want to cut costs ... a 50 dollars purchase order can be cut to 7 dollars with EDI". Consider the substantial number of transactions that the US Department of Transportation handles in a year.

Super Valu Stores Inc., one of the largest US retail chains, claims that EDI produced visible savings of $ 6,000 a week in direct operating costs.

IBM estimates savings of $ 60 dollars from using EDI in 37 plants with 2,000 suppliers for 80% of purchased production material over five years.

Westinghouse indicated that, with EDI, the amount of time spent tracing shipments was reduced by a least 90%.

Indirect benefits such as better customer service, can hardly be valued.

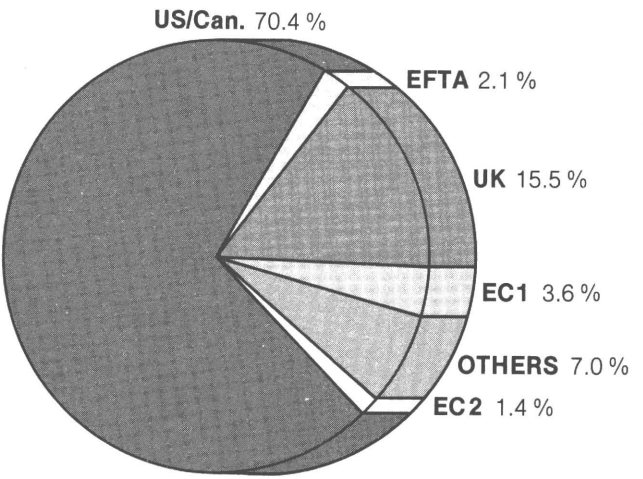
A considerable number of small/medium companies are already drawing substantial benefits from EDI : 10,000 cases of directly achieved benefits in the United States and Canada and about 2,500 in Europe.

The number of estimated sites where EDI was operational at the start of 1989 (see figure 1) may seem small. But EDI only really started in Europe in 1986 and a few years earlier in North America.

FIGURE 1

EDI IN THE WORLD

Distribution of Sites



EC1 Denmark, West Germany, Netherlands.

EC2 France, Italy, Spain, Portugal, Belgium, Ireland, Greece.

OTHERS New Zealand, Australia, Pacific Basin.

INS of the United Kingdom, which today has 1,200 companies connected through its successful TRADANET network estimates that the total number will reach 10,000 within the next four to five years.

The same could be quoted for ISTEL, the second largest private network in the United Kingdom.

The European automotive club ODETTE is well advanced in the application of EDI in Europe; it can be expected that altogether automotive companies and suppliers will easily add 3 to 4,000 sites in the next four to five years.

The UK construction industry plans to link some 5,000 sites in the United Kingdom by 1995.

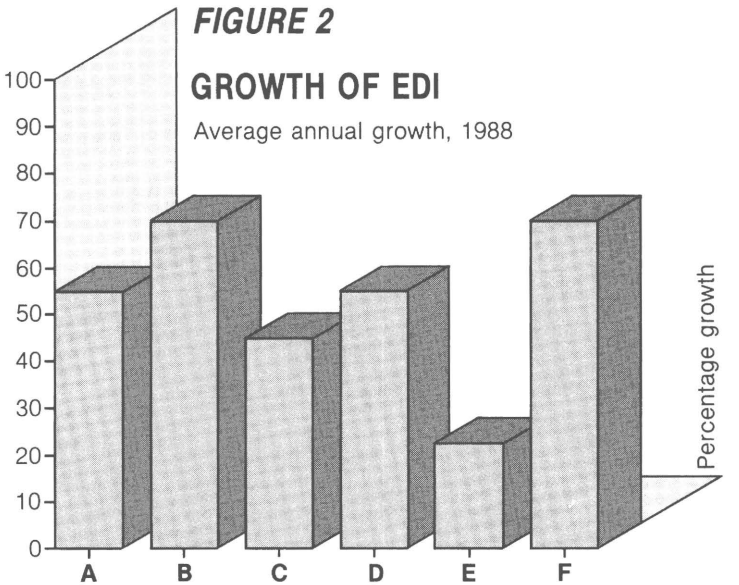
Forecasts for the transport and shipping industries, for the insurance and banking services, for the chemical, retail, manufacture, tourism, pharmaceutical sectors and a host of others abound.

In all we are talking about figures that when statistically projected and based upon a modest annual growth of some 70 to 80% per annum, show that, in Europe, some 150,000 companies may be engaged in EDI by 1996 as against the 250 to 300,000 companies in the United States and along the Pacific Rim. (See figure 2: Average annual growth).

FIGURE 2

GROWTH OF EDI

Average annual growth, 1988



A EFTA countries
B UK
C Denmark, West Germany, Netherlands
D Others : New Zealand, Australia, Pacific Basin
E France, Italy, Spain, Portugal, Belgium, Ireland, Greece
F USA & Canada

It is against this background of consistent development and take-up that management plans for the introduction of EDI in a company must be made.

Why should management allocate time and resources to make EDI happen?

1. EDI may become a prerequisite for doing business.

Already some large multinationals ask, when tendering, whether applicants have facilities available for exchanging data electronically. They will do so increasingly in the future.

In banking, a good part of international settlements pass through the SWIFT network. This channel of communication is almost an essential condition for doing business.

In retailing, specially in the UK at present, almost all feel obliged to use the electronic channel. Competitors do it. You have to follow.

Some companies even go as far as offering EDI systems, help with education and general assistance worth thousands of US dollars to ensure that partners join in the EDI movement.

2. EDI can force through a change in market conditions.

It can, for example, create the situation where new, distant markets can be reached, quickly bypassing competitors.

EDI can be instrumental in creating new advanced and cost-sensitive products, particularly when linked with just-in-time and similar techniques. It can stimulate growth of the market by offering better products at lower cost. It can thus assist to reach critical mass targets.

By the same token, EDI can increase the competitive drive by offering new high-technology driven entrants the opportunity to gain a foothold in new or existing markets.

3. EDI will improve the organisational information flow within a company.

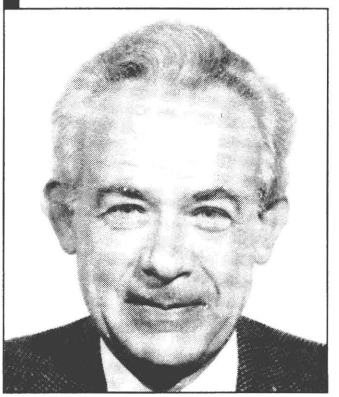
By cutting off the middle layer, EDI permits faster communication between people, faster decision-making, faster production schedules, faster follow through and faster money flows.

EDI simplifies the managerial tasks. It puts management in contact with the wider world and gives access to bases of information anywhere at anytime.

EDI will have an impact on staff changes; it will affect priorities and simplify communications.

4. EDI will improve the communication flow with external parties.

The relationship with customers and suppliers will change through EDI. With suppliers, EDI will increase choice : a manufacturer may no longer be restricted by geography and distance in choosing his suppliers. This will give more opportunities to suppliers in dispersed regions : EDI will basically help in breaking down the distance barrier. Here is the link with argument over the single market in Europe in 1993.



Emile PEETERS

Head of the Electronic
Data Interchange Unit
Commission of the
European Communities, DG XIII

THE TEDIS PROGRAMME

TEDIS is the acronym for Trade Electronic Data Interchange Systems. The TEDIS programme was approved by the Council on 5 October 1987 and was launched on 1 January 1988 for an initial period of two years with a budget of 5.3 million ECU.

Coordination

One of the main tasks of the TEDIS programme is to coordinate EDI activities. This coordinating role is important for those national bodies concerned with the simplification of trade procedures and for the sectors of European industry affected by the introduction of EDI.

TEDIS is already lending support to :

— ODETTE in the vehicle manufacturing sector,

— CEFIC in the chemicals sector,

— EDIFICE in the electronics and data processing industries,

— EAN in the distribution and retail trade sectors,

— RINET in the reinsurance sector,

— the transport sector, where TEDIS is responsible not only for coordination with other sectors but also for coordination within the complex transport sector itself.

Support from the TEDIS programme is subject to the compliance with and application of existing international and Community standards, and in particular the recommendations of the United Nations' Economic Committee for Europe on international trade procedures. All the schemes mentioned above have agreed to use the international Edifact standard (Electronic Data Interchange For Administration, Commerce and Transport) and participate actively in the work to standardise and develop electronic business messages.

The Commission's activities have received a boost from the interest shown by the standardisation institutes and the various bodies in the Member States working on the facilitation of trade. EDI forums have been set up to concentrate resources. Potential EDI users and suppliers of EDI systems and software need locally available information and coordinated national participation in international work. TEDIS supports and encourages these activities. However, one of the major obstacles to the development of EDI in Europe is the absence of a single standard.

UN/Edifact

In 1986, the Commission of the European Communities started to encourage work on the convergence of international EDI standards and participate actively in the development of the international Edifact standard.

For more than a year now TEDIS has been giving its full support to the work of the Western European Edifact Board. The European Committee for Standardisation (CEN) has granted the Western European Edifact Board the status of "associated body", thus recognising its competence and authority in the field of EDI standardisation in Europe. It is divided up into various message development (MD) groups :

— MD1 trade

— MD2 transport

— MD3 customs and official procedures

— MD4 finance (banking and insurance)

— MD5 tourism

and soon

— MD6 statistics

There are in addition :

— TAG (Technical Assessment Group) for technical validation

— MAG (Maintenance Advisory Group) for maintenance

— PDG (Promotion and Documentation Group) for the dissemination of information.

Standardisation work has advanced very rapidly under the aegis of the United Nations' Economic Committee for Europe. As well as a trade data elements directory (TDED), the EDI community has at its disposal the UN/Edifact syntax rules, the UN/Edifact syntax implementation guidelines and message design guidelines. Since September 1987 the UN/Edifact syntax rules have been an international standard (ISO 9735), TDED already having been an international standard (ISO 7372). These two international standards have recently become European standards EN 29735 and EN 27372.

Although at present only one type of message invoice has reached the stage of a UN standard, some 30 other types of message are being developed. By September 1990, or at the latest March 1991, ten out of these 30 messages will have become UN standards.

Commission Edifact Board Information System (CEBIS)

CEBIS is the information system developed by TEDIS to assist the work of the Edifact Board. CEBIS contains all the approved data elements, segments and messages and all the new or modified versions of these data elements, segments or messages created during the work of working party 4 (WP4) of the UN's Economic Committee for Europe in Geneva. CEBIS has become an indispensable reference tool for the message development groups, as well as for TAG and MAG groups. In particular it makes it possible to measure the effect of a change proposed by one group on the messages being developed by the other groups.

CEBIS is an information system which is not accessible to EDI users. However, it is planned to make "stable" CEBIS information available to them via the Commission's ECHO host computer, using the X25 public communications network.

Telecommunications

EDI does not require the development of new telecommunications networks, but it does place new demands on existing networks. TEDIS registers telecommunications needs expressed by EDI users and passes them on to those repsonsible for European telecommunications policy. The potential volume of EDI traffic is unknown, but it is clear to users that the existing data networks are not capable of providing the desired level of service. The X25 options have not been implemented everywhere in the same way; the capacity of international lines is inadequate. Tariffs vary greatly from one country to another and are in some cases calculated on the basis of very diverse criteria. This applies to both public networks and leased lines.

Message security

Basic services should be identical to those provided by the post office's recorded delivery service. There must therefore be ways of establishing the authenticity of partners exchanging an electronic message and the integrity and the non-repudiation of the electronic message.

The confidentiality of the electronic message would not seem to be a major concern. The same applies to electronic messages as to letters. If the contents are to be kept secret, sender and recipient must take appropriate steps and have recourse to specific services. The Commission has been

carrying out a study on security standards, in public networks in which TEDIS has actively participated.

Legal aspects

The traditional use of "paper" documents and handwritten signatures is recognised under the laws of many Member States, but this is far from true of electronic messages. A detailed study is being carried out under the aegis of TEDIS on trade rules and practices in all the Member States. This study should make it possible to draw up proposals for the harmonisation of the various legal systems. A model interchange agreement with specific commitments to different parties is also needed. TEDIS has been active in bringing the various industrial sectors together with a view to drawing up this model agreement.

At present electronic messages can be exchanged between private firms on the basis of prior agreement. The UNCID rules (Uniform Rules of Conduct for the Interchange of Data by Tele-transmission) approved by the International Chamber of Commerce and adopted by the UN's Economic Committee for Europe are a good basis for agreements between trading partners.

Publicity and promotion

The primary aim of TEDIS is coordination; the second is publicity. Pilot projects on the introduction and use of EDI by small firms have been launched. These relate to the transport, paper, insurance, wholesale and retail trade, chemicals and music sectors. TEDIS also lends its support to EDI conferences and exhibitions as well as publications and media presentations for example an introductory manual on the use of EDI and videotapes explaining EDI and UN Edifact.

Survey of the level of knowledge and use of EDI

The level of detailed knowledge of EDI in the European Community varies widely. On the basis of interviews conducted the percentages ranged from 70% for the United Kingdom and Denmark to 20% for Ireland, Greece and Portugal. However, at least 2/3 of the interviewees were to some extent aware of EDI. In these interviews, the present obstacles to the development of EDI were identified as : lack of standardisation, legal constraints, security concerns, and simple resistance to change, and lack of information on the general management and technical aspects of EDI.

EFTA countries' participation in TEDIS

The six EFTA countries (Austria, Finland, Iceland, Norway, Sweden, Switzerland) are very active in the EDI field. They participate effectively in the work of WP4 in Geneva. They have very competent trade facilitation bodies. From the very beginning they have been involved in the work of the Western European Edifact Board and they have seconded a member of the EFTA secretariat to the Board's secretariat.

In April 1989 the initial TEDIS Decision of 5 October 1987 was amended by the Council to allow non-Community countries, in particular EFTA countries, to be associated with the TEDIS programme.

The future TEDIS programme

For future EDI actions the Commission must submit proposals to the Council once the initial two-year period has expired. In July 1989 at a TEDIS conference, the main developments of the current programme were presented. Following the conference recommendations were formulated. The TEDIS team now has to set about compiling a report on actions and developments under the current TEDIS programme and drawing up a new TEDIS programme for the years to come.

EDI: THE EC AND THE WORLD

Angus FRASER

President of the UK Electronic Data Interchange Association

In the EDI field, the stakes are colossal : EDI bids fair to change the whole concept of how business will be run in the years ahead. The implications are much more fundamental than the economies and improved service which flow from the fact that EDI is a mechanism for taking what is on one company's computer and putting it directly onto another organisation's computer with no print-outs, errors, or rekeying, with no waste of staff time, no postal delay, and no misunderstanding because of language barriers, so that it can be as easy for a firm in Perugia to order goods from a supplier in Sheffield as from one in Milan. These benefits are important and should not be minimised. But there is more to it than that. EDI's immediacy can change the structure of a market. In some sectors EDI is already a prerequisite for doing business at all. It often changes the relationships between organisations and their trading partners. Those who fail to embrace it face the prospect of exclusion from their markets as they lose competitiveness.

The major challenge is not a technical one; it is one of effecting a cultural change within organisations. As Viscount DAVIGNON pointed out, we already have a modern electronic structure in many ways, but the capacity to use it is still very limited.

Progress

In certain ways, there has been enormous progress. The relative speed with which Europe and America managed to reconcile their separate standards and produce Edifact was truly remarkable, and the specific messages are now flowing out. With matching progress on software and telecommunication facilities, all parties involved in international trade may at last be liberated from the shackles that used to keep them locked into particular enclaves and they can develop their own systems at the same time being free to transfer data to others as required. The imperative need now is to work away from the old dedicated or closed set-ups and adapt to open systems.

Disparities

The present disparities between countries and between geographical regions are striking. North America and the UK happen at present to be the front runners in the world. Within Europe there are enormous disparities. If one looks at the rest of the world the gaps widen still further. Given the very different growth rates, the risk is that the disparity is going to widen rapidly.

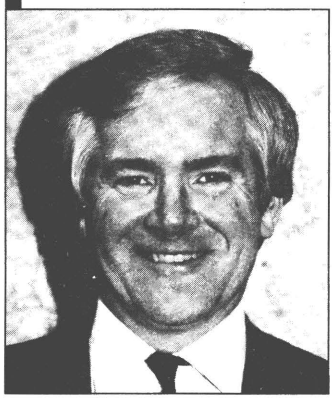
Role of the Community: Implications of 1993

More than 90% of European EDI appears to be national in its character. But there are many areas where a European solution is needed if the full benefits of EDI are to be reaped. That is why the Community's TEDIS programme is so important, with its two watchwords, coordination and awareness - coordination of the various EDI projects and national approaches; awareness among the users and producers of EDI equipment and services. The completion of the internal market will bring enormous opportunities but also a spectacular rate of change that cannot be handled in-house alone : it demands cooperative systems, shared between trading partners. We have to avoid the electronic ghettos.

"EDI : 1992 and beyond" is the title of this conference. But what is going to confront us when we wake up on 1 January 1993 ? There can be a lot of front-end investment involved in setting up EDI and if we are to look forward to the rewards of post-1992 we need to be in a position to plan for it now. One reason why it is so difficult to plan effectively for 1993 is of course that the process is a political one. Does anyone feel they know for sure, for example, just what is going to happen in regard to customs operations throughout the Community on 1 January 1993 ? On what basis will the physical displacement of controls, away from the frontiers for intra-Community trade, operate, and how much data, and in what form, will need to be transferred ? There can be little room for doubt that EDI will, one way or the other, play a vital role in the full realisation of the single market, whether it is the removal of trade barriers, the removal of fiscal barriers or as Mr PANDOLFI described to us, a number of other possible administrative applications, in the process of establishing what he called the nervous system of Europe - whether it be the interconnection of police and immigration computers to ease free circulation of travellers, or the interconnection of several security data bases.

EDI: THE EC AND THE WORLD

– The EC Market



Dennis McGINNIS

Philips N.V., the Netherlands

EDI MEANS 'LESS'

In the eyes of many multinationals in Europe 1992 means less : less factories, less warehouses, less partners, less suppliers, because now comes the age of trying to be one big organisation in one location without barriers. These barriers have forced us to have more over the years : more local facilities, more local sales organisations, more local suppliers and so on, and now the problem is to change that to 'less'. That 'less' situation dictates more communications, faster communications, more reliable communications. That is why EDI and 1992 are partners, because EDI is a tool to help accomplish that goal and to apply this not-so-new technology within businesses across all countries.

EDI is of strategic importance to Philips. Implementing it quickly can mean a competitive edge over our rivals. Closer working relationships with our customers and suppliers may be developed. Philips is a multinational company doing business today in over 60 countries, supplying a wide variety of products across many different markets, showing technical leadership in electronics and telecommunications. EDI implementation with our customers and suppliers should mean we are ahead. The flow of paper has been reduced by applying automation in our company, but we are still buried in paper. EDI is a continuation of this automation process started in the 1970s when we developed our own internal formats. We have supported the development of international standards over the years, looking for one answer to help us in inter-company, inter-country, inter-continental communication; these formats served us well internally but are too costly to maintain and too difficult to market. Until last year a single methodology for business to business communications internationally was only an expensive dream : today multinational companies have been proud to play a part in the UN undertaking, UN-Edifact.

In our manufacturing company EDI is now being applied. More important, however, is to see which strategy has been adopted for the next four or five years. EDI is of strategic importance because it is enterprise-to-enterprise

communication between us and our trading partners; it yields improved trading relationships by closing gaps and better managerial and business decisions. Improving customer-service, being a more value-added and a lower-cost supplier is the essence of EDI implemention. It crosses all the boundaries of business. A maze of messages can be used, particularly in manufacturing, but when you look at shipping and planning, things that every company has to succeed in, these are the types of things that we have really had to work on internally and now externally with our suppliers and customers.

Calculating costs

The costs are very important. We very often do not know what they are and when we go back to our management and say: "I want to do this", the first thing they ask us is "What will it cost?". People who hold the financial purse-strings of companies are not data-processing people. There are many benefits to be gained in administrative areas : reduction in the costs of errors, improved productivity, reduced costs of inventory, reducing the days of holding inventory. To achieve that with a supplier, the speed and the accuracy of communication have to be improved. Time-value benefits may be considerable, but what is to be done with all the time saved ? What about the people who are to be displaced ?

A survey was done recently in the US with 1,000 EDI users. They were asked: "What was the number one reason why you went about this process ? Why was EDI implemented in your company ?" The answer was, to access the information in supplier and customer computers, in other words enterprise-to-enterprise communications in order to have improved customer-service, to accomodate peaks and variances in the business flow, to be able to integrate and extend their own environments into their customers' and suppliers' environments. This requires a very close cooperation between the company, the customer and the supplier.

There are many case studies (see examples). In one of our operations about three hundred million dollars in orders are done electronically on a daily basis, without anyone touching them. However, it may not be the same in other companies, one must see where the benefits are. What will make EDI a sound short-term investment ? How is it possible to recover the initial costs ? How can EDI become a competitive weapon ? How in fact, can it become part of one's survival ?

CASE STUDIES

HEWLETT PACKARD : GERMANY

- 25 % - 40 % savings in buying agents time
- 66 % reduction in cost per purchase order and confirmation
- 5 % reduction in data entry errors
- 25 % increase in administrative staff efficiency

HEWLETT PACKARD : NEW YORK

- 38 % overall savings in accounts payable processing costs
- 20 % data entry savings
- Improved control on receipt of invoices

PHILIPS CONSUMER ELECTRONICS U.S.

- Processing today 300 million dollars in paperless orders
- Processing over 200 million dollars in paperless invoices
- Saving over 1 million dollars per year

NAVISTAR INTERNATIONAL

- Saving of $ 5.00 per business communication (invoice, sales order)

DIGITAL

- 75 % reduction in purchase order preparation costs

GTE-USA

- 93 % reduction in purchase order preparation time

USA FEDERAL GOVERNMENT

- Electronic purchasing 3M, Kodak, others
  Savings of 28 million dollars

SEMINOLE MANUFACTURING

- Cut delivery time in half and increased sales 30 % due to greater product availability

Management culture and scarce human resources

The EDI process is not easy. The number one ingredient to success is a management agreement to change not only the way one does business, but also the way customers are handled today and the way one communicates. It takes one tremendous effort as well as persistence. There are not enough EDI consultants to move Europe to EDI by 1992. There are not enough

software companies, there are not enough and there will not be enough. So self-help is the key. It is up to us to bring that talent into our organisations, to find out where and how to apply EDI, technology to know which tools to use, to acquire those tools, to understand the communications process and to set measurable goals.

Philips is setting up a world-wide network of centres, to support product divisions in the 60 countries where we do business. An international organisation cannot be run from one office, there are language problems as with EDI and one has to be able to communicate. Within these service organisations, services are being provided to our product divisions, to our suppliers and to our customers such as consultancy, helpdesk and message translators. These divisions have to be staffed with local people who understand the business problems within countries such as Italy, Germany, France, Spain, Portugal, Greece. One cannot import people and expect it to work very well. People who already work for the company have to be trained and consistent knowledge must exist across an organisation. One problem in Philips today is that everyone is reinventing the wheel, and it is not necessary as there are proven methodologies and proven ways of doing things. Most companies do not budget for promotion and the biggest cost is promoting to one's partners. Education, retraining, and EDI services must be provided within the company to succeed in implementing EDI across Europe or across the world.

Ian RODGERS,

Overseas Freight Manager,
ICI Chemicals U.K.

DISTRIBUTION - THE LOGIC OF 1992

ICI in 1988 produced a turnover of over $20 thousand million and profits of $2.6 thousand million, making it the 4th largest chemical company in the world in turnover terms. The turnover breaks down as follows : 'Specialities' (paint, pharmaceuticals, dyes and colours, plastic film (for audio, video and electronic applications), and so-called 'effect' chemicals account for 40% of turnover; industrial chemicals - the product we think of when we talk of the chemical industry (high volume, relatively low-value products) and an essential part of our modern industrial society account for 45%; and agricultural chemicals - a combination of fertilisers and crop protection chemicals for 15%.

In 1987 the general chemical, petrochemicals, plastics, fibres and fertilisers businesses were hived off as ICI Chemicals and Polymers Ltd., a wholly owned subsidiary of ICI plc. It is this part of the business, which has its own peculiar problems and opportunities, that concerns us here.

ICI Chemicals and Polymers is very much a European business. Nearly 80% of the sales of ICI Chemicals and Polymers are made in the UK or Continental Western Europe. It is a commodity business : product differentiation is hard to find. The price will not vary much from supplier to supplier, nor will raw material and production costs. After several years of satisfactory returns, there are signs of softening in some of our markets and 1992 will add further uncertainties.

Destabilisation, restructuring and more competition are the key words. We are used to a European market in which any sector is normally represented by twenty medium-sized customers. The logic of 1992 and beyond is that the twenty will become five large customers. The relationships we have created over many years will have to be rebuilt with new managements which have new philosophies.

With regard to distribution there are several ways in which EDI can contribute.

Distribution is not a glamourous occupation, you will hear many a distribution manager say that he is only noticed for the one time things go wrong and not for the 99 when things go right. However, once the sale has been made, distribution is the main contact with the customer and good delivery can make a major contribution to ensuring that the customer comes back again and again.

In our business the total cost of distribution - order processing, warehousing and transport is still between 10% and 15% of sales value - say $750 million on ICI's total European business. Very large sums of money have already been spent on computers to streamline all aspects of distribution but it is still estimated that 70% of the data input to computer sytems is contained in documents which are themselves printed out from some other computer system.

If EDI links with our customers and carriers can eliminate that manual task, what implications does it have for our organisation ?

Lower Costs and Better Cusomer Service

A recent survey of our own operations in connection with a quality management programme showed that our operatives spend 50% of their time on inputting data to the system, 25% of their time correcting errors of one sort or another and only 25% of their time in what might be termed the proactive elements of the job.

If 70% of the input time can be removed by the use of EDI and that produces a 40% reduction in error then up to 45% of people's time is released.

Management then has to decide what happens to those jobs. How can this spare resource make operations more effective ?

Within one department this may not cause difficulty. The disappearance of whole departments whose main function is inputting data becomes a decision for very senior management. If this happens across whole industries, the elimination of large numbers of clerical jobs becomes a special problem.

The benefits we seek internally then are a reduction in duplication - in the form of less rekeying of data - a consequent improvement in accuracy and a speeding-up of administrative processes: in sum, lower cost and improved quality. At ICI we have no doubt that the cost benefits exist; we are already processing orders from our subsidiary in the USA using an internal EDI link, a system which we plan to extend to all our major non-European markets.

It is my belief, however, that the more exciting benefits are to be derived in the customer service area. EDI, it has been said, offers business benefits through putting information to work. It is not just sufficient to take the customer's order and to supply the product on specification and on time.

The customer needs to know how his order is progressing. His plans may change and he needs to know where the delivery is.

We are all becoming familiar with such concepts as 'just-in-time'. First-class customer service is all about being able to keep the customer informed about progress at all times. He must feel your company is an extension of his own. This has always been possible but it has been very expensive in time and effort to follow orders and deliveries through the system. Some products can bear this cost : commodity chemicals in general cannot.

At present we have a very effective sales organisation based on a local ICI company in each market. The national selling companies receive orders from their customers and key them into a central pan-European system which passes them to the appropriate manufacturing site. The product then is allocated and the carrier automatically notified of the pick-up date by telex, using the telex as his pick-up document.

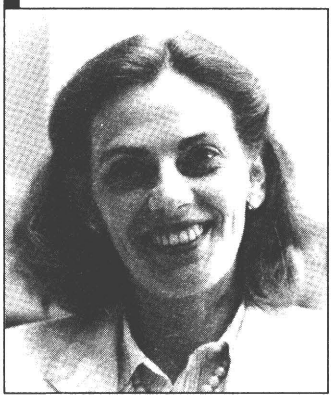
We have to be able to guarantee delivery in most of France, Benelux and Germany within 36 hours.

What actually happens ? Billions of dollars of capital and the efforts of tens of thousands of people are devoted to cultivating customers, gaining the order, manufacturing and packing goods and loading them on to a vehicle. These then leave the gate and disappear down the road. We first know we have a problem when the customer calls, saying his goods have not arrived.

EDI will change all that. The order will be received by EDI in the national company, eliminating re-keying in the sales office. It will be handled by the same system but the message to the carrier will be an EDI message telling him when to pick up the goods and that we will pay the appropriate charges into his bank account - no invoice from the carrier will be required. A simple status message exists for the carrier to notify us of the progress of the order.

The negotiation of such a system has wide implications. The requirements of customer, supplier and carrier have to be clearly defined. Instead of imposing requirements on the carrier, the supplier agrees with the carrier how together they can meet the customer's needs. The customer in turn negotiates the service package with the supplier, not just the price. This shows the importance of the customer-supplier partnership for 1992 and the need to form a partnership with key customers, at the same time understanding what each requires to get the best out of such a partnership with an honest discussion as to how the benefits can be shared.

We must be ready to meet the challenges of the single market and the benefits EDI can bring (as seen in the USA). At the EDI '88 Conference in London, ICI's ex-Chairman, Sir John HARVEY-JONES, in the keynote speech, said "the man who is really close to his customer, who is really inside his mind and whose operations are linked to his in the most intimate way, will stand the best chance of survival".



J.C. HUGUET

Directorate General of Customs and Indirect Taxes,
French Customs Administration
(presented by Béatrice CAUSSE)

CUSTOMS AND ELECTRONIC DATA INTERCHANGE

Customs offices' responsibility for customs declarations and inspections means that they are an integral part of the system for transport and distribution of goods, situated between the production of goods and their final delivery.

Customs offices have to carry out their duties without slowing down the movement of goods. Speed is the essential element of 'just-in-time' industrial strategy and one of the criteria for competitiveness of ports, airports, railway and road haulage depots. The completion of the Single Market will make the speed of inspection even more vital, since Community administration implies the prompt exchange of information between the Member States. One way of achieving this is via EDI, and this is why the French Customs have been associated with the development of Edifact standards within the Community's CADDIA programme. Our system of computerised customs clearance (SOFI) is being developed for use with EDI messages and we hope to extend it so as to reduce the paperwork to a minimum while continuing to observe the law's requirements.

SOFI provides real time processing of import, export and transit declarations for all modes of transport. The agent preparing the declaration completes all the grids as they appear on the screen, while the system carries out a range of checks. A tariff-data file then completes the operation, indicating which documents must be provided. This enables the agent to decide whether to go for immediate clearance, in which case the declaration is final and cannot be altered, or to postpone it until the documents are available.

Finalisation of the declaration submits it to the pre-programmed selection criteria so that goods are given various kinds of customs status. Accounts procedures and preparation of statements for agents and customs offices are also dealt with.

However, in its present form SOFI has two drawbacks :

— it cannot handle simplified procedures;

— it does not permit easy communication with corporate data processing systems, even in the more advanced SOFI II form.

Adapting SOFI for receiving and transmitting messages will require a range of modifications. For instance, it will have to be specially adapted for carrier purposes, so it can process complete messages without the need for checking errors. It will also have to be capable to convert data transmitted on Edifact standards into the right format for the existing systems and vice versa : this could be done in an experimental phase by a front-end microcomputer. Public carrier services like Atlas 400 will have to be tested for transfer safety and for the ability to cope with the volume of data SOFI can produce (10 million declarations in 1988, i.e. some 50% of customs clearances).

Will EDI improve relations between customs offices and business ? Major companies involved in foreign trade will clearly benefit from the EDI handling of simplified procedures on the lines of those proposed by the Community. In particular :

— reduction of the time during which goods are held. At the moment, customs offices have thirty minutes to act after transmission of a simplified telex or fax declaration. During this time goods must be available for inspection;

— decreased corporate computer operations, as foreign-trade statistics could be compiled by the customs computer centre. At the same time, examination of simplified declarations could be streamlined by using automatic selection criteria, something that is not practicable at the moment, while much tedious cross-checking could be eliminated.

Existing procedures would be supplemented by new ones like advance declarations, where goods are sent to the customs clearance point. The customs point would process the data and send the result to customs office and agent : non-sensitive goods would be cleared at once.

The application of EDI could ultimately lead beyond the current developments, to the complete automation of trade and the end of paperwork. Automated customs clearance would be followed by direct debit of customs dues : experiments in this area are in progress. However, at present the law imposes strict constraints on customs offices : a written document is the only acceptable proof and the courts only accept handwritten signatures. Customs offices do not have the facility given to private contractual partners to circumvent this obstacle: a computerised customs transaction still has to be accompanied by a signed summary document as authentication.

In the long run it is up to the technicians to demonstrate the reliability of the data exchange systems, but the European Community is already committed to the support of EDI and should play a major role in development of law, basing its strategy on the extension of Edifact.

Mr Georg SCHÄFER,

Ministry of Home Affairs,
Land Baden-Württemberg,
Federal Republic of Germany

REGIONAL INFRASTRUCTURE FOR EDI

Some of the regional aspects of EDI can be illustrated by two examples from Baden-Württemberg, a highly industrialised region of Europe. The first is the example of a very innovative car producer, Mercedes-Benz; the second is the situation of the average company in the region.

Mercedes-Benz started in 1987 with EDI and the VDA norms, which are special norms for the automotive industry. Mercedes-Benz has ten production plants with a total of 1,800 suppliers. 750 of these suppliers have tested EDI with Mercedes-Benz; 350 are still developing their systems; 150 are now paperless; a further 200 operate manual data exchange and electronic data exchange in parallel.

Because Mercedes-Benz started early, it did not need any additional manpower. There have so far been few security problems, even with automatic transfer day and night. If a company decides today to introduce EDI, it cannot expect to harvest the fruit of that decision tomorrow. But an early decision means that a company gets EDI at a lower cost.

What are the benefits of that decision ? 15-20% less manual labour - as a conservative estimate - and stock optimisation. But most important is the gain in competitiveness by mastering every change as it takes place.

Take the example of Recaro car seats. These seats are fitted as extras and the orders are often changed at the last minute. To avoid stocking all the seats needed for the next month, the target in a crowded region like Baden-Württemberg is to order the seats from the producer four hours before they are delivered and then built into the car. This is the basic idea of the just-in-time philosophy. The market is changing. Demand is becoming more and more individualised.

Take another example. Some years ago, a car manufacturer had to build 400 different engines : he now needs more than 1,000 different engines because of varying pollution regulations from country to country.

With the market switching to more individual orders and individual demands, "just-in-time" is the way to meet the challenge and that is impossible without EDI. Baden-Württemberg has a great concern for this because there are many small companies which are often associated with major companies. And these small companies must be integrated into the bigger company; otherwise the companies would move away from the region.

Mercedes-Benz also looks to the creation of a Europe-wide network for EDI communications. More application areas will bring a need for more norms. A Europe-wide value-added network for EDI communications would be a great help for all companies, but especially for the small ones as it would decrease their investment requirement and reduce the number of networks.

Not so urgent for the moment is electronic signature and the use of holography : but this will become urgent when more people are using EDI.

Now to the second example : it comes from SAP, a software company in Baden-Württemberg, one of the leading software producers of commercial application systems. SAP made a survey in August 1988 of 800 clients : 25% used EDI but mostly by exchanging media tapes, diskettes or VDA norms in the automobile industry; there was no Edifact user; 75% intend to use EDI or Edifact by 1990. But do these 800 firms really understand the demands of the market of tomorrow and do they have the means to cope with them ?

Management must think EDI and understand the implications for the company. This is not just introducing another technique and making a one to one transition from manual labour to electronic labour.

Here is a third example from the public administration of our Land. EDI is used for 90% of data communication with the banks, while for the remaining 10% paper-based work is easier. Twelve office automation projects are being implemented. The Land has built a network for electronic document interchange between the different authorities in Baden-Württemberg : beginning this year, electronic texts will be exchanged in some application areas between the ministries of the Land. Next year, or by 1991 at the latest, all documents will be exchanged between the ministries electronically.

What is the influence on the region ? EDI keeps our region competitive. Without EDI we shall lose jobs and our market share. The sectors most concerned are manufacturing, transport and software production. There is a great demand for skilled consultancy in this area.

Large companies like Mercedes-Benz are the moving forces. They make the software, even for the small companies, and they provide the consultants with experience to learn what is coming next with EDI. EDI is not the only

aspect that makes a region attractive. There are many aspects, such as the schools, the universities and road communications (a four-hour delivery margin is not possible between different regions). A region must fit in with the technology and EDI is one of the most important technological aspects.

EDI: THE EC AND THE WORLD

– The Global Dimension

Anthony J. D'ANNA,

Consulting Member, AT&T, USA

NEW TECHNOLOGIES AND EDI STANDARDS

The global status of EDI can be characterised as an idea conceived, but the idea has yet to pass through its infancy stage where its true character can be determined.

The expectations of the rewards to be gained through a global standard excites anyone who deals in any way with the movement or management of information. Almost every major industry - be it telecommunications, automotive, chemical, aerospace, etc. - has its own EDI standards meetings to define implementation in that industry. On a corporate level enormous resources are devoted to define corporate implementation consistent with the industry and with the national standard. The extension of this activity on a global level has further compounded the effort to remain abreast of developments.

What keys all this activity ? Where are we with EDI standards ? Must the development of a global EDI require this magnitude of effort or are we attempting to emulate practices that might work on a national scale but become burdensome on an international scale ? The answer is not yet clear.

While this standards activity is proceeding at a furious pace, another activity is proceeding at an even more hectic pace - that is the underlying technology on which EDI is based. The rapid development of technologies is changing the economics of EDI and also permitting approaches which were literally impossible a very short time ago.

These rapid changes are occurring in :

— telecommunications
— data processing, both hardware and software
— optical character readers (OCR)
— synthetic speech
— data base management systems, and
— artificial intelligence.

All of these have considerable impact on the shape of EDI.

The underlying EDI technology is advancing at an ever-increasing speed. The standards process must also advance or it may become a detriment to implementing the best technology. The speed of this advance can best be understood with some examples from the field of telecommunications :

1. Since 1977, when AT&T introduced a commercial system using optical fibre, the bandwidth has been doubling annually. This trend is likely to continue for the next twenty years. By way of illustration, the 32 volume set of Encyclopaedia Britannica containing 2 billion bits could be transmitted in one tenth of a second.
2. Digital telecommunication networks will enable integration of voice, data and radio. The promise of Integrated Systems Data Network (ISDN) is now.
3. One megabit RAM chips are being manufactured. Four megabit chips will appear soon. What is more, this progress shows very few signs of abating.
4. A truly fully-fledged distributed database management system is in the wings. Data will be stored wherever it is convenient and users will be able to access data without knowing - or caring - where it resides.
5. Synthetic speech is being used in numerous applications.
6. Optical Character Readers have dramatically decreased in cost while being able to recognise a multifont of multisize characters with high accuracy.
7. Artificial intelligence logic is being applied to many applications impacting on information exchange. In effect, with this technological progress one can economically consider systems with almost unlimited bandwidth - move as much data as you need, store it anywhere, and retrieve it quickly. It can be retrieved no matter what form it is in - video, character, voice - and computer logic can process it.

Corporate America is as confused about data exchange as anyone around the globe. Many US corporate leaders have been led to believe that a complete set of EDI standards have been completed, tested and implemented in the US. The notion of finding a new international single standard leaves many bewildered and some actually opposed to the concept. The difficulty for upper management may not be lack of knowledge and recognition of EDI, but rather it may be that changes are coming much too fast. These changes are coming from the standard makers and simultaneously from the providers of the technology that the EDI standards are based on. EDI may be just like the stock market, in that when uncertainty reigns, investment slows.

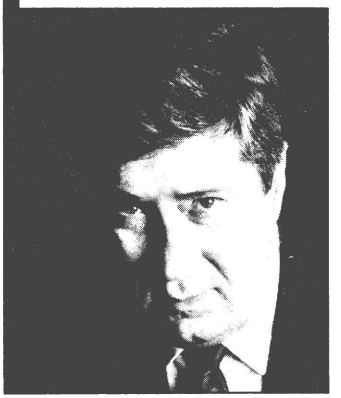
Today, management is asking "Can the standard-making process now in place produce a comprehensive, timely, maintainable set of standards to keep pace and adapt to the rapid technological advances being made ?"

To achieve this goal, the following points should be observed :

1. The international EDI standards process must be streamlined by having an accelerated programme of developing EDI practices for EDI itself.
2. The standard makers must broaden their view of EDI to include a full range of standards from product research, development, acquisition, maintenance, and even disposal.
3. There must be rapid development of interactive specifications for EDI.
4. A graphical data specification must be included in a fashion that does not make current practices obsolete but allows for efficient communication and control.
5. The current EDI concept may be too highly focussed on extreme specificity of the messages resulting in overly complex messages.
6. Finally, for EDI standards to bear full fruit, first must come the ability of equipment suppliers' products to interwork across networks and for networks to interconnect compatibly at much higher levels. The signs are promising.

There are certain areas of regulatory policy that will stimulate this trend. One is in the freeing of public procurement policy for telecommunication equipment across Europe as we move towards 1992 and beyond. This has already happened in the UK and the USA.

Without it, little incentive exists for foreign telecommunication equipment manufacturers to change their equipment to fit different standards. As a result, there will be no real commercial pressure to harmonise on a single international standard.



Marshall A. SPENCE,

President, EDI Council of Canada

THE INTERNATIONAL DEVELOPMENT OF EDI

Canada has been actively involved in sending EDI messages internationally since 1985. In fact, Canada is unique in the EDI world in that we as a country send more EDI messages across our border than we send across our own country.

The recently concluded Free Trade Agreement between Canada and the US has greatly increased the flow of EDI messages between the two countries and highlighted the vital role played by EDI in helping Canadian companies stay competitive in a "free trade" environment. This same scenario can be predicted between the countries of the European Communities as they move towards 1992. I have no hesitation in forecasting that EDI will play a vital role in the increased business stimulated by the EC's "freer trade" environment.

The Canadian experience

In four short years, EDI has gone from a zero base to nearly 700 companies actively using EDI, a growth rate of approximately 100% per year.

Canada now enjoys a position of prestige in the international EDI scene that has been won on several fronts. First has been our ability to "sell" EDI to major companies and governments. Another factor is our leadership in assisting other countries to establish EDI Councils to promote the use of EDI in those countries.

It is worth a brief look at our history to help understand how we achieved this leadership role in the growing world of EDI. The first EDI pilot scheme in Canada took place between 15 founding companies. A key recommendation from this initial pilot scheme was that Canada should not attempt to enter the standards business. The US had started the entire EDI process, so public EDI message standards were already developed when we in Canada entered the initial EDI pilot schemes. The obvious answer was to take these existing

standards and insert into these standards unique Canadian requirements instead of reinventing the wheel.

Our Canadian EDI pioneers further decided that third party, value-added communication networks were the most efficient method for corporations to use EDI in large volumes. Consequently, Canada has contributed significantly in this area of EDI technology. In fact, the GEIS EDI network, offered by General Electric, was first tested and developed in Canada.

Thus armed, Canada was equipped to send and receive EDI messages internationally and pursue aggressively international trading with a competitive edge gained from EDI use.

The EDI Council of Canada

The initial Canadian EDI pilot project also pointed out the need for a governing body to help the process of promoting, educating and standardising EDI use in Canada. The result was the formation in summer 1985 of the EDI Council of Canada. The Council has the following objectives :

— to promote the use of a common standard for the electronic transmission of business data;

— to enhance and maintain the standard;

— to act as the definitive body for the use and development of the standard;

— to deal with other standards groups and with governments where the EDI Council will serve as the voice of the industry on EDI;

— to assist members in the implementation and use of the standard;

— to ensure the EDI Council, its board, its committees and its staff are working in the best interest of the users.

The EDI Council has a Board of Directors made up of senior executives from leading Canadian companies. These board members play an active role in promoting EDI use and implementation not only in their own organisations, but also use their position in the business world to influence other senior management in their various industry groups.

Their efforts helped lead to EDI implementations in a broad cross section of Canadian industry - sectors such as automotive, chemical, drug, electrical, food retailing, food brokerage, banking, forestry, mass retailing, office products, petroleum, steel, and transportation industries.

This, in turn, led to EDI interest and increased activity at the highest levels in both our Federal and Provincial governments, including Canadian ports, customs, communications, supply and services and external affairs.

We would not have succeeded so quickly with the outstanding EDI record we now enjoy in Canada and internationally without the active role played by senior management in EDI strategy.

First International Congress of EDI Users

The EDI Council of Canada continues to play a leading role in assisting other trading countries to set up EDI Councils based on our role model, as well as to promote the expanded use of EDI internationally.

In particular, we have worked closely with South Korea, Australia, Italy and New Zealand.

Active involvement by the EDI Council of Canada with these and other countries preparing for EDI led to the request for an annual meeting of EDI users from around the world.

Accordingly, the EDI Council of Canada was asked to play a leading role in establishing a regular venue and, along with the US user body, took on the challenge of organising the first International Congress of EDI Users, which took place in August in Vancouver, British Columbia.

The first Congress was an overwhelming success with almost 800 delegates and 24 EDI trading nations in attendance, hearing important keynote speeches, attending EDI workshops and seminars, and viewing the latest in EDI technology at the two-and-a-half day event.

The EDI Council of Canada was approached during the Congress by delegates from Hong Kong, Indonesia, Japan, Malaysia and Taiwan to assist these countries in setting up governing EDI bodies based on the organisational model practised by the EDI Council of Canada.

To ensure the growth and development of these annual International User Congresses, a steering committee comprising the world's leading EDI governing bodies - including in Europe, IDEA - has been formed.

Already, the dates for the 1990 International Congress of EDI Users have been chosen as July 16 to 18, in San Francisco, USA.

As a further indication of the commitment from world EDI bodies to promoting EDI, the city of Brussels has already been chosen to host the 1991 event.

T.P. HAYES

Secretary-General,
Customs Cooperation Council

EDI IN EUROPE AND ITS IMPLICATIONS FOR DEVELOPING COUNTRIES

EDI is a technology that will help keep the European market more prosperous and more open to trade across the Atlantic. In the longer term EDI and the stimulation it will provide to trade between developed economies will lift those economies onto a completely new level of prosperity.

In its 1988 Trade and Development Report UNCTAD looked at information technologies' impact on traditional forms of industry and policy implications for developing countries. It stated the following :

"A veritable information-based technologies revolution is under way with wide-ranging repercussions on the ways of handling production and economic organisation. No country can ignore these technological developments or suppose that this is an area where no domestic efforts are necessary. If it was true in the past that at least some kind of industrial development was a sine qua non for economic advancement, so, in the last decade of the second millenium, is this true of the information technologies. The whole of manufacturing itself, including the international division of labour in manufactures, is being affected by these changes. What happens in these branches of services is going to be a key determinant of production and trading advantages throughout manufacturing and agriculture."

EDI will widen the gap

Information technology, and EDI in particular, will widen the prosperity gap between developed and developing countries. This will happen because EDI will directly increase productivity and wealth in the developed countries and because EDI contains within it the possibility of an insidious form of preference against economies not equipped to participate in EDI based trade.

Hence, it threatens a vast unconscious conspiracy of discrimination by 10% of the people on this planet against the remaining 90%.

At a very minimum, countries which still rely on paper-based records for international trade after the year 2000 will be able to retain their place in world trade only with increasing difficulty and risk.

Surely the development of the common market in Europe and the key role of EDI in that cannot run its course without Europe having another look at what its actions mean for the developing world.

But in the meantime, what is required of policy to minimise the detrimental effects of EDI ?

Standards

It is obvious that one common international language for EDI is a prerequisite for minimising the discriminatory effects of EDI.

In this respect we must all be grateful to those who contributed to the remarkable emergence of the Edifact standard.

My own organisation, the Customs Cooperation Council and particularly the customs services in Europe, the United States and officials in the Commission have played a key part in all of this.

The total commitment which now exists by customs services around the world to the Edifact standard will be a compelling incentive to ensure that Edifact will become a common language for those using EDI in international trade.

Worrying signs show it will take some time for Edifact to replace a number of other national and proprietary standards. We must combat any tendency for particular industries to develop private deviations from Edifact messages.

To that end it may be questioned whether sufficient manpower and funds are being made available by governments to aggressively develop and promote Edifact.

Need for computerisation

EDI is the technology of putting computer systems in touch with each other. It establishes intimacy between distant computers. In a hundred years this will be seen in retrospect to have been as revolutionary as the introduction of the telephone.

If your business or government activity is not computerised, it is unlikely that EDI will hold much attraction for you.

Certainly there are ways of interfacing a manual system into an EDI system, and on the surface they appear attractive, but it misses the whole point of EDI.

EDI has been developed to avoid the need for a manual link between distant computer systems hence making the need for computerisation more pressing than ever before.

When I refer to computerisation I mean the use of computers in an enterprise or government function to handle the bulk of the daily information transactions that are fundamental and central to the enterprise or function.

Defined in these terms, many enterprises and government functions in even the most developed economies today are not computerised. They clearly should be questioning that.

In developing economies a great amount of effort has gone into computerisation. Some have been remarkably successful in lifting the level of computer literacy through a wide range of educational and practical programmes and in computerising a range of public and private enterprises. A significant amount of credit must be given to UN agencies who have for some time given considerable attention to assisting developing countries with informatics.

Overall, it must be said that developing economies are way behind the developed economies in computerisation as I have defined.

If developing economies are to have any prospect of sharing in the trade opportunities and the new wealth that will be generated by EDI, it is imperative that they maintain the highest possible priority for effective computerisation of key enterprises, government functions, and the education of personnel in the use of computers. Therefore the focus for policy makers must be on computerisation and education in computers and not on EDI as such.

Areas of most potential for EDI

What are the kind of enterprises in developed economies that tend to be heavily computerised and for whom should EDI hold considerable interest ?

There is a tendency to think that EDI is associated solely with high technology industries, in particular the automotive and electronics industries. EDI will have a much wider impact than that. One of the earliest industries to take up EDI was the food and beverage distribution industry. Even small retailers today rely on their bar code readers, their computers and their modems to take the drudgery out of stock control and pricing. Wholesalers in turn rely on their computers to not only take orders from retailers but to place orders with manufacturers.

It will be some time before EDI is widely used for buying and selling capital items such as ships, power stations, or exotic and specialised products. In

each case either the specialised nature of the sale, the infrequency of trade between particular buyers and sellers, or the variability in price and quality will make the human element indispensable for a long time to come. EDI, however, will flourish in enterprises which deal with inventories of standardised products and trade regularly with a stable set of partners at predictable prices.

Views of the Customs Cooperation Council

None of what has been said is new to any of the one hundred and four customs services around the world which make up the Customs Cooperation Council.

At its annual session for 1989 in Washington, the members of the Council spent some hours discussing computerisation, and EDI and its impact on the Council's objective.

The Council realises that its actions can equally facilitate or obstruct the implementation of EDI for international trade. There is not much point in firms investing heavily in EDI if they must still laboriously prepare and produce paper documents for customs in either the country of export or the country of import.

Hence, the principal objective of the Council is to secure the highest degree of harmony and uniformity in customs systems around the planet. We see in EDI an opportunity to further that goal. If EDI standards are not pursued forcefully from the start the damage to the objectives of the Council will be irrevocable.

In Washington, the Council acknowledged the difficulty that EDI will cause member customs services in developing countries, and accepted that more needs to be done to ensure that all member administrations keep up with advancing trade volume and technological innovations. It came to three conclusions :

— advice and guidance should be provided to launch special programmes for those member countries still dependent on paper records; assistance in streamlining current procedures, progressively adopting automated techniques and resolving difficulties;

— seek access for members to additional resources to implement automation and EDI by co-operating closely with other governmental and non-governmental international organisations;

— identify members' training needs in automation and arrange for training with the assistance, where necessary, of member administrations and other international organisations.

We have recently published a guide describing what should be done to computerise customs systems and the pitfalls to be avoided.

In addition, we are strengthening the available expertise in the secretariat for computerisation, EDI and training. In the upcoming years we expect a growing demand by members for the services of our experts in these fields.

ASYCUDA and UNCTAD

More important than these initiatives is a project started some years ago by UNCTAD with assistance from the French customs. Since then, several other customs administrations have been providing assistance.

The UNCTAD project has the title ASYCUDA - Automated System for Customs Data. It sets out to develop a suite of standard software programmes for all major customs tasks which can be run on relatively inexpensive micro-computers.

If one standardised package of software could be devised to meet the requirements of many customs services there would be a massive saving in efforts. More than three quarters of the world's customs services are not computerised.

Moreover, world traders would receive an almost priceless gift - a largely standardised customs procedure.

UNCTAD offers the world a practical way of advancing computerisation in developing countries. Moreover, it provides them the basis for a strategy to avoid the harshest discrimination that will accompany the early stages of introducing EDI in developed countries.

How much success has the UNCTAD project enjoyed ? Over 80 customs services have expressed interest in adopting the system. An early version of the software is being used in five countries.

Of particular interest in this forum is a recent decision by the UNCTAD team to ensure full Edifact compatibility and to add modules for port and transport-related functions in the course of a major update of the software now being undertaken.

Unfortunately, UNCTAD has just nine programmers working on the task when ninety is more like the minimum needed.

A Europe that is concerned about EDI and its effects on developing countries should be prepared to do something special to lift the UNCTAD project onto a completely new level of achievement. It needs much more than the backing it has received up to now.

Conclusion

With respect to developing countries, our guidelines must relate to two imperatives :

— more emphasis on education and training in computerisation of key enterprises and government functions in developing economies, and

— immediate and substantial assistance for the ASYCUDIA project.

EDI: THE SOCIAL DIMENSION

Marita WELLMANN

Head of Technology,
Deutsche Postgewerkschaft,
Federal Republic of Germany

EDI AND WORKING CONDITIONS

In the Economic and Social Committee's Opinion on the TEDIS programme, it was suggested that social interest groups be brought into the dialogue on the effects of the programme at an early stage, as the programme would have direct and indirect effects on the labour market and working conditions in commerce, industry and administration. However, the TEDIS programme concentrates mainly on commissioning research into technical and legal questions. Rapid, large-scale data interchange will have major implications for working conditions and therefore workers. Ordinary people will also be affected by new communications technologies. It is therefore necessary to outline a number of concerns and possible effects.

In some cases job losses are to be feared, particularly administrative jobs and women's jobs. New skill requirements can be expected, as can the greater dependency of small firms (sub-contractors) on larger firms. This may be associated with the erosion of the rights of works councils and of the representation of workers' interests in general. Working conditions will be dictated by large firms. More demanding performance at the workplace and potential for closer monitoring of workers could also be consequences of rapid, large-scale data interchange, unless there are compensatory or restrictive countermeasures. Stress and the need for a high level of concentration can in some cases be damaging to workers' health.

The current programmes fail to address the social consequences for workers and the general public. Research in these areas is essential if events are to be influenced in time and undesirable developments forestalled. In Germany for instance there is a research programme on Work and Technology. Whilst the trade unions are not entirely happy with it, particularly as regards the volume of funding, support arrangements and opportunities for applying findings, it does nonetheless offer the opportunity to research and test, on a small scale at least, ways of making the use of technology compatible with humane working conditions.

In the interests of the protection of workers the following is essential : extension of participation rights, prompt measures to upgrade skills, employment programmes to counteract job losses, compensation for the greater demands placed on workers in the form of breaks or recovery periods and the application of scientific findings in organising working life. Use should be made of research findings in establishing a sensible balance between human being and machine and in the design of hardware and software. Excessive use of technology for monitoring workers is also to be avoided.

Public Utilities and Private Services

The German Postal Workers' Union has taken large-scale action against the statutory reorganisation of the Bundespost, also involving EDI. We demanded that telecommunications be kept in the public sector, and criticised the arrangements for satellite communications and mobile telephones along with the decision to allow private firms to offer services. The Bundespost provides industry with an essential infrastructure : weakening the Bundespost's finances by privatising the more profitable activities and leaving the loss-making ones in the public domain would have far-reaching consequences.

The reorganisation of the Bundespost has been influenced by Europe, by its so-called "backwardness" and other trends. We have never been opposed to the modernisation of information infrastructure per se but feel it necessary to hold up the social consequences to scrutiny and forestall undesirable developments. No-one should be either privileged or underprivileged as far as communications are concerned, and outlying regions should be as well provided with technology as highly developed areas.

The main source of income of the public telecommunications utilities, as for example voice telephones, must remain secure over the long term, even after the transition to ISDN. In establishing open network access, the public telecommunications utilities must not be saddled with economic burdens which could endanger services. They must not be disadvantaged as against private suppliers of services.

To make sure that only high quality equipment can be connected to the public network international standards and uniform acceptance criteria must be used. If workers' representatives are attempting to tackle these tricky problems, it should be made clear that they do so first in the interests of telecommunications workers, but also in the interests of the public at large. These trends affect everybody. Of course exemplary data protection laws are needed in order to match the expansion of the technological options available to the consumer.

Basic Social Rights

Briefly with regard to the German Postal Workers' position on a social Europe; the fact that the Economic and Social Committee's proposal form uniform basic social rights is to be reflected merely in a solemn declaration is disappointing. Apart from the right to work, to economic and social democracy, social justice and equal treatment in the workplace, European basic social rights should also include the demands outlined in the ETUC's social programme and the proposals of the Economic and Social Committee.

The German Postal Workers' Union is not opposed to the use of new technologies in principle and is not setting out to denigrate technology. Our aim, rather, is to ensure that sensible measures are promptly adopted in the interests of workers and the general public.

Luc SOETE

Director of the Maastricht Economic Research Institute on Innovation and Technology, the Netherlands

THE PROCESS OF TECHNOLOGICAL CHANGE

Most of the paradoxes concerning EDI have been raised in the field of economics. In this instance, the paradox arises from the fact that although the computer is all around us, no productivity growth is registered in the statistics. In fact, productivity growth has slowed down, be it by individual sector or at firm level, or at national level. It has not picked up, even in those countries where EDI has had the greatest impact, for example in Japan where the productivity slow-down has been significant.

Technological change is first and foremost a social process. More than the technological base, integration and mediation of new technology in society are the central issues in this process. Many technologies have been blocked in this way in their diffusion. Societies confronted with new technologies have not been able to reap the benefits. EDI is one of these : moreover, being a network technology, its diffusion depends more than others on the social dimension.

Built-in Blockages

With network technologies, traditional economic features such as increasing returns from dependency are present. But with these technologies what is particularly important is the possible presence of systems which prevent the technology from being diffused. Technology is blocked not only because the initial investment is substantial, but also because previous technologies may have become dominant, preventing the spread of existing or new technology. For example, the QWERTY keyboard used for computers was developed over a hundred years ago primarily to slow down typing to stop the hammers on typewriters blocking. There is no longer a need to slow down typing, yet the QWERTY system is still with us. Other systems were introduced (like (DVORAK by APPLE) but were unsuccessful because of the existence of a typical established network system with its learning and teaching programme, its network of secretaries used to that particular keyboard and

so on. History is full of examples where diffusion of a more efficient technology is held back or prevented by such factors.

For diffusion of efficient technology such as EDI, the social - or societal - dimension is very important. For integration to occur the time lapse involved in the whole societal adaptation is crucial. A historical comparison with electricity is one example. In the 1900s electricity in factories was used simply to replace the steam-engine with no organisational change and consequently very few efficiency gains. This changed only in the 1920s when "unit-electricity drive" was perceived as the major organisational innovation and the full benefits of technology started to emerge. So the integration of technology is paramount for efficiency gains. With respect to information technology and EDI the first steps are only now being taken towards recognition of these potential gains.

Market Power and Small Firms

When dealing with the diffusion of EDI, especially with respect to manufacturing and the social dimension, an economic concept should be introduced which has to do with the particular forms of market structure involved. Production side efficiency gains from EDI include for instance "just-in-time" production, reducing inventory controls and costs as well as delivery time. Such methods have been being introduced at a time when inter-industry structures were characterised by monopsonies; in other words, firms with relatively strong powers could force their suppliers to deliver on time, at a certain standard of quality and at a particular price. For example Philips or Marks & Spencer put pressure on their suppliers although in the latter case it is more oligopsony since a few firms have applied pressure together.

In the services sector, customers are invested with certain powers, i.e. as the user of a particular product where consumers express the individual need. In the banking sector, for example, EDI technology was introduced forcibly under the pressure of big users. The Dutch banking sector, for instance, was lagging behind in information technology and EDI but the banks were forced to go electronic and to improve their EDI systems by the large multinational corporations, these being the majority users.

An economic system with strong monopsony structures - companies or industries with power over their suppliers - carries the risk of market duality. This has social implications. Duality exists between small and large firms. The pressure of oligopsonies when introducing EDI into small firms has and will continue to have a very strong social dimension. A large multinational company has no problem in reallocating the employees displaced by EDI; this is true in Japan where there is a self-employment system and in many American and European countries. However, where small firms are concerned, the pressure is dramatic and they suffer the social consequences. Again in the case of Marks & Spencer in Britain, the pressure put on clothing firms could even lead to the emergence of sweatshops.

The stage has been reached where the introduction of EDI in several prominent sectors of the economy makes linkages, on-time delivery and quality-control essential. Small supply-firms may then lose control. This may also be so in the services sector.

In conclusion, just as EDI is a potential technology, the implementation of which will depend heavily on the social/societal integration of the technology, 1992 too, could well be viewed similarly as a potential breakthrough for the European economy, not least in terms of social integration. The combination of EDI and 1992 therefore necessarily involves a social dimension to these issues of structural change.

Hans-Joachim KERKAU

Berlin Commissioner for Data Protection

DATA PROTECTION AND TELECOMMUNICATIONS

Endeavours to remove national barriers to electronic data exchange may seem to run counter to the concern to set up general barriers in telecommunications for the protection of individuals. However, only by recognising general social barriers in data processing instead of national ones will it be possible to introduce transborder telecommunications services with any long-term success.

Renowned car manufacturers such as Volvo, Mercedes and BMW have long recognised that product safety is a major contributory factor to market success. Hence, manufacturers vigorously promote both active and passive product safety features, drawing attention to airbags, computer-calculated crumple zones, ABS brakes, etc. Such safety aspects increase customer acceptance and confidence enhancing a firm's reputation. This philosophy should be extended to telecommunications if this sector is to achieve long-lasting success. Until now, very little has been done in this respect.

The Social Dimension of Telecommunications

How does data protection constitute the social dimension of telecommunications ? The following examples provide an answer :

— When the Swedish data-protection law came into effect, Volvo, the Swedish car firm, transferred the whole of its personnel data-processing operations to Hamburg. The Gruner + Jahr newspaper group transferred a duplicate of its electronic newspaper archives to Switzerland. Behind both decisions lies an attempt to bypass national legislation created to protect employees' and individuals' rights, by transferring operations to data-protection havens.

— An inspection of Berlin hospital telecommunications revealed that it was technically possible to access patients' data over the international

research network because the hospital data processing system was linked up to a university computer centre, which in turn was connected to a research network. Political uproar ensued in Berlin leading to the removal of the hospital's data from the research network.

— An inspection of digital telephone extensions in Berlin revealed that by using special wiring, confidential internal telephone conversations could be recorded and monitored unknown to the speakers at either end of the line.

— The social dimension has also emerged in police matters. A German on holiday was arrested in New Delhi because his name appeared on the local computer's list of members of terrorist organisations. It took almost a year to clear up the case; more than ten years earlier, a person with a similar name had been put on the German authorities' wanted list. This information had gone into the Federal Criminal Police computer and thence to Interpol from where it was sent out world-wide. The name had been taken off the wanted list many years prior to the New Delhi incident, but the authorities had clearly failed to pass this information on. In this case, the authorities' negligence led to considerable unpleasantness in the form of days of custody and costs amounting to several thousand German marks.

In view of the clear upward trend in transborder data traffic between public bodies and private individuals, we must assume that the number of similar data casualties will increase drastically. There are numerous concrete examples of the increase in data traffic: attempts to set up a European trace-and-search network (Schengen Agreement); greater labour mobility resulting in increased information exchanges between social security institutions; increased use of credit cards resulting in large amounts of customer data throughout Europe being stored centrally; and transnational research projects, particularly in health issues.

The importance people attach to these matters was revealed in a survey carried out during the European elections by the well-known economics magazine, Capital. The survey asked what should be dealt with on a European scale. It was surprisingly revealed that, throughout Europe, data-protection came at the top of the list after environmental protection and was viewed as being equally important as finding a solution to the unemployment problem. At the root of this attitude lie day-to-day encounters with increasing centralisation in administrative and technical matters, which have not always been positive. Consequently, individuals feel that their personal rights are increasingly under threat by incidents such as those already outlined.

People should no longer feel that they are helpless in the face of an impenetrable jungle of government administration, large firms and computer technology.

Civil Rights Protection

National barriers in telecommunications should be dismantled, but the establishment of new boundaries which help protect civil rights is in the best interests of the individual citizen, manufacturers of telecommunications productions, national governments and public acceptance of telecommunications products. Europe has done little to provide this protection.

To meet the needs of the social dimension, we need an integrated legal framework to ensure fair handling of personal data. Data processing systems operating internationally should be set up in such a way that individuals can assert data protection rights without undue difficulty.

It is of particular importance for an individual to know at all times to whom he can turn if problems arise in the processing of his data. Hence all European governments and organisations should provide data-protection advice centres. The upsurge in international data exchange means that an individual's right to decide how his data is used is increasingly under threat; intensive international cooperation between data protection commissioners is needed to counteract this threat.

Nevertheless, it is not enough to establish a legal framework, appoint data protection commissioners or commissions, and improve European cooperation; we must work towards a scenario where technology is used to benefit individuals and safeguard their rights. Experienced data protection specialists must be consulted at an early stage in telecommunications projects so that processing and computing systems can be chosen which are economical with the amount of data required and given out. Consultation is also necessary when designing terminal equipment.

There is insufficient consultation on data protection. Yet such consultation has proven its worth in Germany. When support is provided for telecommunications projects, steps should be taken to ensure that data protection is built in from the start. Moreover, it is essential to cooperate on the fixing of technical standards and provide a forum for talks.

Conclusion

The Council of Europe should provide the basis for the legal framework of data protection, hence it is essential that the five remaining Member States sign the Convention; only then can its revision begin. EC authorities should also recognise the Convention internally. Advice centres where individuals can turn to for help are needed in all Member States and European organisations. It is crucial that a data-protection early warning system in the form of early consultation with the relevant specialists during the planning phase of major data processing projects, and the preparatory stage of EC regulations be established.

Marie GEORGES

Special Adviser, National Commission for Data Protection, France

SAFEGUARDING ANONYMITY

The EDI systems we hear most about at present are national rather than international (90% national according to Mr SARICH), and limited mainly to the commercial sphere (cf. Mr PEETERS). These flows do not cause the recipients of the information many protection-of-persons problems, but they do pose a major security problem, i.e. authentication of the sender, the receiver, confidentiality of transmitted data. Experience shows that this legal aspect, stressed by Mr DAVIGNON, has two sides - an industrial one : availability of adequate equipment at acceptable prices; and a professional one : availability of lawyers and recognised law and practice.

Information flows are starting to develop at an international level. Consequently, the commercial files created must be able to evolve beyond national frontiers.

The growth rate in automation between legally independent organisations shows that EDI systems are particularly strong in the field of commercial relations involving individual consumers (ordering - with in some cases payment by computer, e.g. Minitel, - of all sorts of goods, food, books, theatre tickets, etc.) and in the administrative sphere with the emphasis on simplifying procedures for firms, including matters concerning individuals (transfer of social data). The security problem arises here on a mass scale. Is it safe to communicate a bank card number by Minitel when the correspondent does not know you ? Our daily actions are increasingly being performed remotely with the aid of automatic equipment of all kinds : this provides opportunities for consumption profiles to be drawn up without the individuals concerned knowing what is going on.

It is thus more than ever important to query at the outset whether the exchanges in question should involve names or not. In other areas, such as travel on European motorways with rapid passage through toll gates (the DRIVE project of the European Communities) it would be instructive to pose the basic question of whether names should be known or not, with due respect

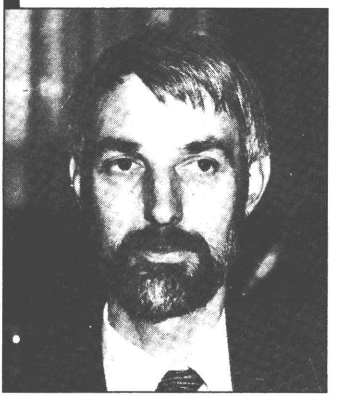
to the freedom to come and go, so that industry can design the appropriate equipment. Similarly, with regard to inter-active television (as in pay television) the protection of freedom of choice should be ensured by anonymous remote payment. Therefore remote services techniques need systems that will enable both accurate identification of the participants and anonymous access.

Simplified EDI exchanges between administrations need to be able to ensure that intermediaries are required to communicate only the necessary data to the various administrations.

The Council of Europe Convention

The introduction of EDI at the international and particularly the European level is bringing a number of data protection problems to the fore. Mr PANDOLFI stated that the Europe of 1992 will need interconnection between the information systems of the various administrations : police and immigration, social security and tax authorities. He announced that the Commission's specialised department (DG XIII) will administer specific programmes in these areas. The SIS system, included in the Schengen Agreement between Benelux, France and the Federal Republic of Germany, and the EUROCODE project, illustrate the urgent need (underlined by the resolution adopted by the European data protection officers in Berlin on 30 August 1989) for the EC to adopt the Council of Europe's Convention on data protection and for all the Member States to enact legislation implementing the principles of the Convention. If this is not done, the European data protection officers could forbid the transmission of sensitive data.

EDI: ENABLING TECHNOLOGIES



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EDI : MORE THAN AN ENABLING TECHNOLOGY

EDI is an important part of a cycle of change that will gradually extend to affect the whole trading community, presenting previously unavailable opportunities to update procedures and permitting concentration on value-added activities. In terms of cost saving, EDI means less paper-processing, fewer errors, smaller stocks, and lower post and paper charges. It may also lead to improved customer service, better stock control, improved cashflow, and better information. Many suppliers are finding that their major customers are insisting that all business transactions are carried out by EDI. It is the implementation of this technology which can produce such wide benefits for business as a whole.

OASiS is particularly concerned with the business impact of technology : when new technology is introduced it must be seen as a support tool which can help functions only if these are themselves properly structured. Such an EDI infrastructure can support a host of applications, but these in turn may have unexpected consequences : changed attitudes towards debt, for instance, may be the consequence of the wider introduction of credit cards and cash dispensers.

How Paperless ?

It should not however be assumed that everything is moving in the direction of paperless trading. Telex is still a huge industry : in some cases techniques are even being developed to structure telexes into EDI format, rather than replace the former with the latter. It is estimated that 80% of electronic mail messages are immediately printed out on paper, while two thirds of documents originated by managers are drafted by hand. Transcontinental facsimile transmission, in a few seconds at a very cheap rate, puts paper-based trading in a strong competitive position vis-à-vis paperless trading.

Inadequate International Communications Infrastructure

As the technology improves, so will the company to company applications and this in turn will increase the demand for international transactions. But international data connections will not be as simple and reliable as local ones. European business to business communications will operate across a complex, restricted and unreliable range of services. The problems in EDI are not about cost, but about establishing a communications infrastructure on which EDI can operate reliably and efficiently.

The Economic Impact

As improved technology enables high volume large user links to be made independently of value-added network services, the recovery of costs will fall more on the small users. Suppliers of multiple customers using EDI on different networks could find that the advantages are outweighed by the costs, or that the large users begin to support their smaller trading partners with direct links.

Ultimately, the globalisation of markets must create a downward pressure on prices, which spells danger for those unable to exploit EDI effectively.

Standards

The diversity of EDI formats is reducing as Edifact becomes more widely used and the introduction of X 400 decreases interface and software problems. These standards will encourage wider use of EDI.

Inter-company and/or Intra-company Interchange

One of the most important aspects of EDI is that the opportunities it provides have to be matched by a recognition that implementation involves at least two companies. The opportunities are much greater if both partners seek to find value added services that supplement basic information exchange. For instance, some of the basic functions (just-in-time delivery) can be supplemented by faster payments and better stock control. But EDI is more than this. For the bigger company with international business, there may be wide applications within the company itself. In such multinational companies EDI enables multi-dimensional strategies which respond better to local markets, tastes, or lifestyles, by optimising overall corporate control of resources. While this may mean the loss of some economies of scale, EDI networking can provide a more flexible and decentralised organisation without sacrificing the benefits that accrue from a global structure.

Any communication infrastructure is basically designed to balance information resources in such a way as to give a company a competitive edge.

With EDI, this means that systems can be implemented to improve existing operations, retaining existing paper-based or computer based systems, or reducing production inventory levels and speeding up reporting systems. At the same time, the advantages from the use of EDI can be felt at different levels in a company, combining to provide a competitive advantage both as regards the internal organisation of the company and for its relations with the customers. Central or distributed data base management can then be used to provide management with information on all aspects of business.

There are many internal opportunities which could be recommended while waiting for EDI to become more generally applicable to inter-company trade. These include internal forms (e.g. Computer Aided Design descriptions or insurance claims) internationalisation and decentralisation strategies, organisational change, matching logistics to EDI cycle times. Those companies which adopt such strategies will be best able to compete in the post-1992 world.

Deregulation and International Networks

The deregulation of communications means that before long there will be few restrictions on global EDI operations. One of the pointers in this direction is Toshiba's Value Added Network for international procurement, spanning Tokyo, San Francisco, Singapore, Taipei, Düsseldorf, Boston and London. This network, with increasing EDI content, now accounts for 15% of Toshiba's requirements outside Japan. But it is estimated that there are some 400,000 enterprises in the world which could use networks of this kind, distributed throughout the main world trading areas. Many of them are in the US, but Europe is growing at the same pace, albeit from a smaller base. It is obvious that the largest potential gains from EDI are international, particularly where time zones can be used to advantage : location is becoming increasingly irrelevant.

Back-up Reorganisation

However, it is no good sending electronic invoices in two seconds if the delivery of the goods still takes five days. To match the invoice it is necessary to recast logistics, distribution and warehousing activities, using barcoded feedback to permit traceability, insurance, proof of delivery, etc.

IT = Information and Time

In the 1990s, it is likely that 'IT' will increasingly come to mean 'information and time' rather than just 'information technology'. Saving time will be an effective way of increasing profit margins and improving competitiveness. Saving time will also mean reducing costs and cutting out inefficiency. But

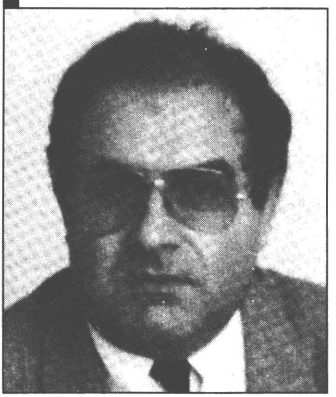
it is only when people begin to understand the power and scope of the tool which EDI provides that there is a real opportunity to transform the value chains in business and trading relationships.

The Behaviour Barrier

Nevertheless, change needs to be actively managed. Before the full benefits can be obtained, there may be organisational and perceptual adjustments necessary. It is this recognition of EDI as a business, achieving a new mind-set, which is more difficult than the standards and protocol conversions. This means that the costs and timescale of getting EDI systems to deliver their promised benefits is not paced by the IT aspects, but by the associated organisational and behavioural changes necessary for their successful implementation. New systems mean new behaviour : the competitive benefits cannot be achieved simply by purchasing an EDI software package.

What may we expect in the future ? Within companies, EDI is likely to become one of management's primary business tools in the next decade, replacing data bases and enabling radical corporate transformation based on the decentralisation of linked business functions. Externally, EDI will transform buyer-seller relationships, accelerate the globalisation of markets and eliminate many market imperfections which at present allow the survival of marginal suppliers in many industries.

The enabling technologies are there. It only remains for you to put them into practice.



Michel-Charles FAVRE

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EDI - A TOOL FOR INTERBUSINESS COMMUNICATION AND A FACTOR IN EUROPEAN INTEGRATION

EDI is one of the many technologies for interbusiness communication. Time is saved with EDI by replacing one mode of transmission (mailing or faxing of business documents and forms) with another (exchange of alphanumeric files). Businesses are offered the chance to streamline their trade considerably and save office costs. Instead of having to re-code information it is possible to envisage a direct interchange from application to application.

Advantages of UN/Edifact

Rules are contained in the UN/Edifact standard developed by the working party for the facilitation of international trade procedures attached to the United Nations' Economic Committee for Europe.

Thanks to a common vocabulary (defined in the Trade Data Elements Directory, ISO standard 7372 and CEN standard 27-372), a universal grammar (application level syntax rules, ISO standard 9735, CEN 29-735) and the UNSM library of standard messages (purchase order, invoice - both of which have already been approved -, despatch advice, delivery instructions, payment order, remittance advice, request for quote, response to quote, transport message, customs declaration, customs response, reinsurance order) it is possible to transfer management information between partners in a direct computer-to-computer link.

The importance of these instruments is clear from their neutrality vis-à-vis

— machines (businesses are equipped differently),

— telecommunications networks; (businesses must retain their freedom to chose a network depending on tariffs, capacity rates, access facilities and ancillary services),

— business applications (Edifact can be used in different environments and can be immediately understood by partners in trade, finance and planning),

— and user languages, since a large number of data (which are standardised for the purpose of their interchange) are in numeric code and can be understood by machines and humans everywhere.

These tools can be used in any firm and benefit both large multinationals where there is a strong need for integration and consolidation and small businesses where such tools avoid red-tape and create scope for initiative.

Implementation of EDI

Thanks to the efforts of the Commission of the European Communities in launching a major programme, TEDIS, for coordinating initiatives throughout Western Europe (including the EFTA countries) and addressing technical, sociological and cultural difficulties encountered at the launch of EDI, the implementation of this new technology is making rapid headway.

The trade facilitation committees act as the go-betweens for the Commission's activities in the Member States. They provide publicity, information and training services.

Socio-economic consequences of EDI

The socio-economic consequences of EDI cannot be emphasised enough. Applications are going to work together, both within and between businesses' information systems. Edifact will help break down barriers between corporate departments with a view to consolidating data for outside transmission.

The more efficient and rapid interchanges are, the more competitive European manufacturers will become and the more balanced regional development will be.

EDI will bring firms closer together in areas which are not closely linked at the moment; thus, for example, companies in Catalonia, Languedoc-Roussillon, Provence-Côte d'Azur and Lombardy will communicate more easily and rapidly and will establish new interregional solidarity which is vital for European integration.

EDI is not only a tool for improving communication between firms but also an excellent means for strengthening the Internal Market and thus consolidating Europe from north to south.

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