

**REPORT ON EDI IMPLEMENTATION IN THE
TRANSPORT SECTOR**

BY

**NATIONAL CONSULTATIVE GROUP ON
TRANSPORT EDI**

EXECUTIVE SUMMARY

The results of the study indicate that significant progress has been made in the application of electronic commerce techniques (including EDI) to that part of the transport sector concerned with international trade.

A number of different kinds of electronic trading systems provide support for different functions. Examples are Vehicle Booking Systems (VBS), Customs COMPILE, E-Mail, and port information systems. The greatest opportunities for enterprises to improve their efficiency, however, are afforded by Electronic Data Interchange (EDI), and this study has accordingly concentrated on that technology.

The Australian Customs Service is recognised as a leading body in the process of reform of business practices through the adoption of appropriate electronic systems in both the public and private sectors.

Some 13 million electronic messages per year are currently being transmitted through the community system, Tradegate, and the volume is set to grow further. Around 12.5 million of these messages are to meet Customs and Quarantine regulatory requirements. The predominance of regulatory messages accords with the strategic priorities of the National Communications Working Party (NCWP 1988).

The expectation that this large base of regulatory messages would automatically lead to the more widespread commercial use of EDI has not been realised, and a lack of sufficient EDI capable business partners has been a frequently expressed concern. In part this is because EDI requires close co-operation and networking between trading partners, as well as a significant level of coordination and agreement within and across industry sectors concerning the business processes to which EDI should be applied.

At present, enterprises in the transport and trading sectors are incurring additional costs through having to run EDI and paper-based systems in parallel, while waiting for additional trading partners to become EDI-enabled.

EDICA and Tradegate have established industry based groups to bring the parties together to achieve coordination and agreement, but this has been slow due to the need to change many fundamental and entrenched business attitudes and the relatively limited level of dedicated resources available to facilitate and drive the process.

As a result, EDI penetration into non-regulatory functions is currently low. However, it is in this area that EDI has the greatest potential to make a major contribution to improving the efficiency and competitiveness of industry and commerce. There is an expectation that the introduction of Sea Cargo Automation in Sydney and Melbourne during 1994 will encourage the wider use of EDI for commercial and operational transactions.

Containerisation of international trade gave Australia an entry into multimodalism for the physical movement of cargo, and hence there is a need for the maritime industry to change the associated paper-based documentary system for its commercial clients. Although the major international shipping and freight forwarder operators have developed highly sophisticated electronic commercial, tracking, and interactive information systems, these are generally proprietary systems and very few of the potential benefits have been extended to their trading partners.

The introduction of EDI into the air freight sector is well advanced, with most of the key corporations already highly sophisticated in the use of information technology, and many of them strongly committed to the exploitation of EDI. The rationalised set of documents introduced by airlines has facilitated this situation.

Interest in accelerating the use of EDI in commercial and operational transactions has been shown by freight forwarders, customs brokers, and shipping companies. In the rail sector the use of EDI is very limited at present, but there are indications that all rail networks will start introducing EDI based systems in the near future, although this may be focussed on domestic industry sectors. In the highly dispersed road transport industry, only a few large trucking companies are using or even implementing EDI in other than the international trading sector. There is no indication that this situation is likely to change under present circumstances.

Although EDI is essentially a business issue related to the re-engineering of business systems within a co-operative networking environment, there are some significant actual or perceived technical problems that need to be addressed. These include effective interconnections between the various networks, compatibility of software, message standards and guidelines for implementing the standards.

Measures to encourage the greater use of EDI can only be successful if all significant technical problems and inhibitors are adequately addressed concurrently.

The introduction of EDI is dependent upon the existence of agreed ways of applying international standards in each particular area of business and government. EDICA is focussing a great deal of its efforts on preparing UN/EDIFACT implementation guidelines for all industry and Government sectors and segments. Tradegate has a primary role in the development and agreement of implementation guidelines for UN/EDIFACT messages used in the transport and related trading sectors.

The peak EDI bodies need to present a common outlook in promoting the adoption of EDI. Accordingly, effective coordination is an essential element of any strategy to increase the take up of EDI.

The majority of organisations surveyed perceived that EDI was either already of high value or that it would pay off in due course. However, there are many instances where the benefits which arise from EDI accrue to parties other than those which incur much of the cost of EDI implementation. Since those enterprises which are key to the success of the endeavour do not necessarily gain commensurate benefits, the take up of EDI is not currently being driven by normal economic incentive.

In the transport sector, the take up of EDI has been based mainly on Customs and Quarantine regulatory requirements and initiatives, and the internal needs of large organisations. The use of EDI for commercial and operational requirements is generally focused on the desire to improve customer service and achieve cost reductions.

Two important conditions must exist before the major benefits from EDI will be realised. Firstly, all key documentary flows involved in the end to end movement of cargo must be handled electronically. Major benefits will include avoiding the re-keying of the same data many times along the information-handling chain, and hence the elimination of very time consuming and costly transcription errors. In addition, all organisations involved must appreciate that this is more than mere automation; industry must re-engineer the existing business systems to extract the maximum commercial benefit from electronic trading. This represents a very severe challenge to any conservative organisation involved in trade and transport.

If it can be achieved, the end to end use of EDI techniques would significantly contribute to focussing the attention of participants in the "Wharf to Warehouse" chain, on the common objectives of improving the efficiency of the importing and exporting process.

EDI cannot be successfully implemented by single organisations working independently. Success requires the collaboration of trading partners and a critical mass of transactions. By implementing the recommendations of the NCWP, Tradegate and the Australian Customs Service have achieved significant progress towards such objectives, although primarily restricted to regulatory areas at this time.

While it is envisaged that EDI will greatly reduce the paper flow, the likelihood of achieving the entirely "paperless office" appears remote. However, between well established trading partners substantial substitution of electronic for paper-based documents is occurring and will increase within the next few years.

6. FINDINGS AND CONCLUSIONS

6.1 SUMMARY OF ACTIVITIES TO PROMOTE EDI

UN/EDIFACT Message Standards (page 11): EDICA, Tradegate, together with a number of Government agencies and individual organisations are cooperating in the development of agreed international EDIFACT message standards. The Department of Industry Science and Technology has provided significant funding support for the Australia/New Zealand EDIFACT Board.

EDI Council of Australia (page 12): EDICA is involved in promoting the introduction of EDI in all sectors of industry and in Commonwealth and State Government organisations. In respect of transport, the Transport Industry Working Party is involved with coordinating the development of EDI messages and related implementation guidelines.

Tradegate (page 24): Tradegate has developed Project Electra to identify and prioritise the commercial EDI and information services required by the transport and related trading sectors. It also manages a number of strategy and working groups; namely, the Maritime Strategy Group, the Air Strategy Group, Consultative Committees in WA, SA, TAS, & QLD, and the ACOS/Tradegate Maritime Vendors Group.

Australian Customs Service (page 30): ACS has been active in introducing a range of electronic trading services associated with its regulatory requirements, including: COMPILE, TAPIN, Air Cargo Automation, Sea Cargo Automation, EXIT 1, EXIT 2 and EDIFICE. It has also been involved in a range of international forums dealing with EDI issues.

Australian Quarantine and Inspection Service (page 32): AQIS has developed electronic systems for the clearance of a number of goods imported and exported from Australia.

Australian Chamber of Shipping (page 32): ACOS has actively participated in the development EDI messages, and produced two publications, namely - "Trading Up- An Electronic Trading Strategy for the Australian Shipping Industry", and "A Plain Language Guide to the Application and Use of Sea Cargo Automation".

Transport EDI Projects (pages 34-38):

- In February 1993, BHP successfully completed a pilot project covering all commercial and regulatory transactions involved in shipping steel between Australia and New Zealand.

- In March 1994, the Department of Transport, Tradegate and EDICA entered into a contract to jointly funding a project covering the commercial process of importing goods by sea.
- Tradegate has agreed in principle to proceed with a project covering the commercial processes of exporting goods by sea.
- Tradegate has approved a project covering the use of EDI in the commercial air freight operations between Australia and New Zealand.

Financial EDI Services (pages 39-43): Users involved with transport and related trading activities have suggested that while banks offer limited financial electronic financial services (eg, direct entry), they have been slow in establishing financial EDI services. On the other hand, it has been suggested that users have not been clear about what they actually need.

National Consultative Group (NCG) on Transport EDI: The NCG is a joint Government/Industry group established in December 1992 to coordinate the introduction of EDI in the transport sector, as part of and integrated trading framework. Its activities (implemented through the Implementation Task Force) have included the production of this report, the establishment of the Suppliers Forum, initiating an EDI project funded jointly by Tradegate, EDICA, and the Department of Transport, addressing international EDI issues (including in the APEC forum) and measures to address banking issues.

6.2 PROGRESS

(a) Penetration

The following data represent the available key indicators of the penetration of electronic commerce into the international trade and transport sectors (as at January 1994).

Number of Users

Estimated number of Users	1500
Estimate of Core Market of Potential Users	5000
Users as Percentage of Potential Market	30.0%

**Number of Messages
Transmitted Through Tradegate**

Regulatory	12.5 m
Commercial	0.5 m
Total	<u>13.0 m</u>

Percentage of Electronic Reports to Customs

COMPILE	97%
EXIT 1	97%
EXIT 2	22%

ACA Waybills 70%

SCA Manifests (% of Brisbane flows only) 30%

NIL

SCA Manifests Other Ports (Due to commence
with Sydney in July 1994)

Percentage of Electronic Reports to AQIS

EXDOC (meat) 95%

The current penetration of electronic messages into regulatory functions is generally encouraging. However, in respect of EXIT 2 the penetration is below expectations.

The extent of EDI penetration into non-regulatory functions is relatively low at this stage.

(b) Perceived Benefits of EDI

The major perceived benefits of EDI are:

- faster and cheaper processing of business data, through avoidance of re-keying data; and hence
 - direct time and labour savings; and

- indirect savings;

arising from the disappearance of transcription errors, which can be very time consuming and costly to correct;

- reduced delays in the movement of cargo;
- improved business efficiency, particularly through the redesign and streamlining of business systems; and
- improved customer service and improved relationships with trading partners.

The majority of organisations surveyed perceived either that EDI was of high value to them, or that it would pay off in due course. The opinion was, however, expressed by some respondents that some commentators were exaggerating the extent to which a "paperless office" was achievable by means of EDI.

There was some enthusiasm for the argument that competitive advantage could be gained from EDI. Other respondents were sceptical, variously because of:

- the substantial investment and lead-times involved for pioneers;
- the need for a critical mass of business partners before returns could be won; and
- the ease and speed with which competitors can then neutralise the leader's advantage.

(c) Gaps

The major gaps in EDI implementation which have been identified during this survey, together with relevant comments, are as follows:

- Exchange of commercial information among shipping companies, freight forwarders, customs brokers, importers, exporters, and their various service suppliers, eg. terminals, depots and container parks.

Importers and exporters have indicated that their priority is to establish EDI links with their domestic suppliers. EDI links with shipping and freight forwarders is not seen as a priority at present.

A major impediment is the need to reengineer the total industry documentation and business systems. This is recognised and accomplishable but has been beyond the resources of Tradegate (which is the co-operative industry body set up to address such strategic issues).

- Use of EDI/EFT for the payment of freight.

EDI/EFT can be installed without interdependence with other systems. Reasons given for not installing EFT are:

- *a desire to integrate the EFT system with major developments going on in their systems generally;*
- *only limited client/contractor readiness; and*
- *less than overwhelming enthusiasm from the banks.*

However, the major benefits arise from integrating the payment process into operational business systems.

- Use of EDI by exporters and importers within the transport chain is confined to a handful of large companies at this time. For the most part international transport arrangements, or at least the documentary requirements are contracted out to customs brokers, forwarders and NVOs. Instructions to such parties are usually given by fax.

Use of EDI in transport will be a secondary extension. The Use of EDI in the trading process has not yet been addressed in any depth.

- It is also recognised that there are gaps (although of less significance) in the use of EDI in road and rail transport, especially in relation to national and international cargo moving through the major ports, particularly containerised traffic.

Common methods, standards and messages are required to cover both pure domestic transport and transport related to international trade.

There is minimal use of EDI among road transport operators in the movement of international cargo. However, electronic systems are being used by truck operators to book slots and minimise queues through vehicle booking systems (VBS).

There is some use of EDI among the major road transport operators, but this is primarily focused on certain domestic industries (notably in the motor car industry, wholesale/retail distribution and air express couriers).

EDI message standards already exist for use by parties such as shipping companies, terminals, depots and forwarders with whom road transport interacts. This work is preparing the way for secondary extension of EDI

messages to road transport operators.

There is to date only limited use of EDI between rail transport operators and their clients. While it is expected that the use of EDI will start to grow significantly over the next twelve months, the timing will be linked to the current upgrading of rail authority computer systems.

(d) Conclusions

The 1500 EDI users in the trade and transport sector, 40% of which are members of Tradegate, provide a useful base from which to promote the take up of EDI more widely. The extent to which use is being made by the vast majority of these enterprises is, however, quite a small proportion of the potential areas of application.

Moreover, a large proportion of the potential population of EDI users in trade and transportation is still to be reached, particularly among exporters and importers.

6.3 CURRENT EXPECTATIONS ABOUT FURTHER PROGRESS

Previously there was a general expectation that the user base established to meet statutory requirements would provide the path along which commercial electronic message exchange would automatically develop. This seemingly inevitable sequence has, however, not materialised.

In part, this is because EDI requires close co-operation and networking between trading partners, as well as a significant level of coordination and agreement within and across industry sectors concerning the business processes to which EDI should be applied. EDICA and Tradegate have established industry based groups to bring the parties together to achieve coordination and agreement, but this has been slow due to the need to change many fundamental and entrenched business attitudes and the relatively limited level of dedicated resources available to facilitate and drive the process.

There remains a generally optimistic feeling within the industry that the facilities for communicating with the Australian Customs Service by computer do provide a base from which the use of EDI can be extended. There is a particular expectation that the introduction of Sea Cargo Automation in Sydney and Melbourne during 1994 will encourage the wider use of EDI for commercial and operational transactions as well. The extent to which this actually occurs, will depend largely on how well potential EDI users cope with the complex cross-industry business systems re-engineering required.

The Tradegate Maritime and Air Strategy Groups are providing the necessary co-operative business networking environment required to accelerate the take up of EDI

in the transport and related trading areas which are set out in the Tradegate Electra program. However, there is a need to address the issue of the adequacy of resources to effectively meet this objective.

In the transport sector, the take up of EDI has been based mainly on Customs and Quarantine regulatory requirements, and the internal needs of large organisations. The use of EDI for commercial and operational requirements is generally focused on the desire to improve customer service and achieve cost reductions.

6.4 INHIBITORS

(a) Educational Aspects

In general, promotional activities such as education, awareness, and training have not been adequately targeted to attract the attention of Chief and Senior Company Executives.

One day seminars with the first half devoted to business issues for Senior Executives, and the second half to practical implementation issues is likely to be more effective than the normal two day seminars. Also, the seminar arrangements should be such as to provide quality without unnecessary or excessive costs.

In many enterprises there is an attitudinal resistance to changing long-established practices. Reasons for this appear to include the apparent complexity of EDI.

There is a fairly widely held view that training for staff involved in implementing and using EDI has been inadequate; this applies particularly to improving accuracy skills in using EDI.

(b) Technical Aspects

Although the decision to introduce EDI is fundamentally a business decision, EDI is reliant on technology and technical issues have to some degree been a deterrent and impediment to the take up of EDI.

Real or perceived technical and supplier-related impediments reported during the survey include:

- on-going problems with inter-operability between networks;
- the cost of EDI software and Value-Added Network services: the costs of network services are perceived as too high by many companies.

- insufficient implementation guidelines to enable EDIFACT standards to be used in particular industry sectors and segments, and to support particular functions;
- a lack of EDI capability in current software application packages; and
- the inadequate level of integration between EDI software packages and internal, custom-built applications, coupled with long backlogs of application modifications and enhancements.

The internationally accepted EDIFACT standard, developed by the United Nations, is accepted by both Tradegate and EDICA, and is the predominant standard used within that part of the transport sector involved with international trade. However, the North American standard known as ANSI X12 (which pre-dates EDIFACT) is still widely used in the domestic retail and automotive manufacturing sectors. This has influenced its use in the Australian road transport industry and its interface with those sectors.

To enable easy document exchange between trading partners in an industry group as well as those trading on a cross-industry basis, it is essential that the implementation of the standard be consistent. To facilitate this, EDICA has established about 20 industry-specific working parties to develop guidelines for implementing EDI message standards.

However, EDICA's experience - and that of software suppliers involved in the Suppliers' Forum - is that the implementation guidelines that are developed separately by some industry associations are not consistent with other industries. Also, some of the implementation guidelines do not take sufficient account of cross-sector requirements and are not always followed by software developers. Communications and consultations between the relevant parties seems to be a problem here.

The survey results suggest that some EDI products currently being promoted are not meeting the expectations of users. It is essential that technical concerns raised by users be addressed promptly. Vendors and users of EDI services need to closely examine the nature and extent of the inter-operability problems highlighted during this survey as being an impediment to the take up of EDI.

(c) Organisational/Economic Aspects

The lack of sufficient EDI-capable business partners was a frequently expressed concern. At present, enterprises in the transport and trading sectors are incurring additional costs through having to run EDI and paper-based systems in parallel while waiting for additional trading partners to become EDI enabled.

The absence of a direct link between costs and benefits (ie the party incurring the costs does not always obtain commensurate benefits) is having a significant negative impact on the take-up of EDI.

The entry of a number of parties promoting ad-hoc approaches to EDI was also reported to have caused confusion in the market place.

There is a fairly broadly held perception that there is a degree of conflict between the various organisations established to foster EDI and provide assistance to new users. There are encouraging signs that this issue is being addressed.

It was widely acknowledged that the implementation of EDI is a strategic business issue rather than a technical issue.

For the full business potential of EDI to be achieved, it will be essential for CEOs and senior managers to become more aware of its role and potential as a strategic business tool. Senior management also needs to become more involved in developing and driving its implementation. This will require them to understand and adapt to the new technology, and to be prepared in some cases to introduce radical change to streamline their business processes (known as "business process re-engineering").

Furthermore, it is not possible for any organisation - irrespective of the commitment of its senior management, or the size of the organisation - to accomplish such a fundamental change in isolation from its business partners.

The implementation of EDI requires cooperative action at all levels between trading partners (both customers and suppliers) and competitors, particularly in respect of technical and business standards. Such cooperative action calls for a significant degree of cultural change and understanding within the business community.

A good deal of ground work has been done within the peak EDI bodies along these lines but to date this has largely grown out of technical rather than business system oriented input.

6.5 THE WAY AHEAD

A number of observations are made below, based on the outcomes of the Task Force's surveys, which are relevant to achieving progress:

- actions to remove as many inhibitors to the take up of EDI as practicable, should be a matter of high priority;
- while EDI offers the greatest opportunities for enterprises to improve the efficiency of their operations, there are a number of other electronic trading systems which adequately meet particular functions. Examples in use are:

proprietary systems, Vehicle Booking Systems (VBSs), COMPILE, E-Mail, and port information systems;

- the wide range of EDI activities being undertaken by various organisations, makes effective coordination an essential element of any strategy to increase the take up of EDI;
- specialist EDI associations need to work together and present a common approach to users and potential users;
- before measures to encourage the greater use of EDI can be fully successful, it is essential that all significant technical issues, and other inhibitors, be adequately addressed;
- there is a considerable number of actual and potential EDI users who would benefit from closer liaison with the specialist EDI associations, their own industry associations, and suppliers;
- there is a need for banks and financial institutions to implement more effective EDI services, particularly for the payment of freight and charges;
- the bill of lading in its traditional form is providing a substantial barrier to EDI implementation. This is a document which embodies many commercial, operational, and legal functions within its single entity, ie.
 - contract of affreightment
 - certificate of title
 - negotiable instrument (optional), and
 - formal receipt for the goods;
- the task of converting all of these functions to electronic trading simultaneously is not practical. The challenge is to decide how best to electronically handle those aspects solely relating to the transport operation, while providing for the status quo in respect of the other functions of a bill of lading;
- the study identified three separate activity streams along the transport chain, each having its own separate documentary requirements. These activity streams are: STATUTORY; COMMERCIAL; and OPERATIONAL;
- to gain the maximum advantage from the nationwide implementation of the Sea Cargo Automation system it is important that this initiative be reinforced by additional activities designed to extend the use of electronic commerce (particularly EDI) to embrace key commercial and operational data flows;

- EDI is essentially a business issue related to the re-engineering of business systems within a co-operative networking environment. It cannot be successfully implemented by single organisations working independently. Success requires the collaboration of trading partners and a critical mass of transactions;
- in the transport sector, the take up of EDI has been based mainly on Customs and Quarantine regulatory requirements, and the internal needs of large organisations. The use of EDI for commercial and operational requirements is generally focused on the desire to improve customer service and achieve cost reductions; and
- while it is envisaged that EDI will greatly reduce the paper flow, the likelihood of achieving the entirely "paperless office" appears remote. However, between well established trading partners substantial substitution of electronic messages for paper-based documents is occurring and will increase over the next few years.

EDI WITHIN P&O CONTAINERS

1. KEY AREAS

1.1 INTERNATIONAL

1.2 STATUTORY/REGULATORY BODIES

1.3 CUSTOMERS

1.4 SUPPLIERS

2. ISSUES

P&O – July 1994

1.1

INTERNATIONAL

- **COMMENCED IN 1969 WITH EXCHANGE OF COMPUTER TAPES CONTAINING MANIFEST INFORMATION.**

- **MOVED NOW TO EXCHANGE MANIFESTS VIA DIRECT COMMUNICATION LINKS**

(ALL AREAS P&O CONTAINERS OPERATE IN GLOBALLY)

- **NEED TO MEET MANY VARYING REQUIREMENTS**
 - **CLIENTS - AS INTEGRAL PART OF SERVICE CONTRACTS**

 - **PORT ACTIVITIES - SINGAPORE**

STATUTORY/REGULATORY BODIES**INVOLVED IN**

- **SEA CARGO AUTOMATION**
 - **AUSTRALIAN CUSTOMS INITIATIVE**
 - **CLEARANCE OF IMPORTS BY EDI**
 - **OPERATING IN BRISBANE**
 - **TRAINING IN SYDNEY**
 - **REST OF AUSTRALIA 1994/95**
 - **INVOLVES AQIS AND PORT AUTHORITIES**
 - **BENEFITS SEEN WITH ROLL OUT AND INTRODUCTION OF OPTIONAL PORT LODGEMENT.**

- **CONFERENCE/CONSORTIA**
 - **EXCHANGE OF STRUCTURED DATA**

1.3 CUSTOMERS

EXPORTS

- **FOCUS ON DEVELOPMENT OF ELECTRONIC FORWARDING INSTRUCTION**
- **SLOW TAKE UP. OBJECTIVES NOT FULLY UNDERSTOOD.**
- **NEED TO PACKAGE/MARKET BETTER EG. COMPLETE A LOOP.**
- **WAYBILL BEFORE BILL OF LADING.**
- **COMPUTER SOFTWARE REQUIRED REFINING.**

IMPORTS

- **PAPERLESS DELIVERY FUNCTION AT WHARF.**
- **UNDER TRIAL WITH INTERESTED PARTIES.**

1.4 SUPPLIERS

- FOCUS ON CONTAINER MOVEMENTS**
- PARTNERSHIP WITH CONTRACTORS (DEPOTS, CONTAINER PARKS, AND TERMINALS) -**
- APPLICATION OF EDI MESSAGES STRAIGHT FORWARD (TWO PARTIES INVOLVED)**
- HIGH LEVEL OF INTEREST**
- OPPORTUNITY TO FURTHER PROGRESS (IMPROVE CONTAINER AVAILABILITY, ETC.)**

2. ISSUES

- LACK OF UNDERSTANDING OF EDI AND ITS BENEFITS
- AN INVESTMENT RATHER THAN IMMEDIATE COST SAVINGS.
- FOCUS TENDS TO BE ON TECHNICAL ISSUES RATHER THAN COMMERCIAL
- WHO PAYS COST OF EDI MESSAGE
- NEED TO LOOK AT NEW INTERNAL PROCESSES (ATTITUDES)
- LEVEL OF COMMITMENT FROM AUTHORITIES
IE. NEW ZEALAND
- LEGAL/RULES/LIABILITIES