Exchanging Data In The Serials Industry

Abstract:

THIS paper reviews the organisations involved in exchanging data in the serials industry, the data they exchange and the methods used. Electronic Data Interchange is defined and some benefits identified. Achieving these benefits depends on the definition of standards, and alternative types of standards and their sponsoring organisations are discussed. Finally, the present state of standards development in the serials industry is reviewed, including the work of ICEDIS (The International Committee for EDI for Serials) and S.I.S.A.C. (The Serials Industry Systems Advisory Committee).

The purpose of this paper is to provide an update and overview of electronic data interchange in the serials industry. The issues listed in Fig. 1 are reviewed.

Figure 1.

PURPOSE:	Update and overview of electronic data interchange
AGENDA:	Typical data transfers in the serials industry.
	Organisations involved.
	Why standards?
	Types of standards.
	What is EDI?
	EDI: Benefits.
	Different EDI standards
	Who defines EDI in the serials industry
	The Joint Serials Committee —JSC
	SISAC

Organisations Involved In Data Transfer In The Serials Industry

Most exchanges of information take place between one or more of those organisations shown in Fig 2. (*See end of text*). I haven't drawn in all the possible relationships here: clearly there are other connections that could be made. It is worth noting

By CHRIS BECKETT

that the role of the library system and of its vendor is much more important in an EDI environment than in a paper-based one.

Data Exchanged

Our industry depends upon the timely and accurate exchange of different categories of information (Fig. 3). Orders are sent from libraries to agents and on to publishers. Claims follow the same route, while invoices go from publisher to agent, and from agent to library. There are address changes, going from library to agent to publisher. There are acknowledgments of some of these transactions.

Less frequent but of no less importance are the annual price adjustments made by publishers. Updating of prices in the subscription agent's system is a major exercise that runs for some weeks, involving changes to thousands of supplier price details.

Lastly there is the provision of despatch date information. This involves the publisher letting the subscription agent or library know what issues of a journal have been published, and when they were despatched. Currently this information is provided regularly on paper by some of the major publishers. An major factor in determining how to migrate transactions from a paper to an electronic environment is the frequency and size of transactions. Some transactions, such as providing an invoice, are low frequency, high volume transactions, while others, such as claims, are high frequency, low volume transactions, for the library at least.

EDI — A definition

Electronic Data Interchange is the automated, computer to computer, exchange of structured

business documents between an enterprise and its vendors, customers and other trading partners. There are three points that follow from this definition. Firstly, EDI is characterised by the participation of two or more organisations, each having one or more computer-based applications which need to exchange data. Secondly, it is axiomatic that the data should be exchanged electronically, typically by transmission. Thirdly, the data exchanged must conform to a pre-defined, highly structured format, that both the sender and receiver can anticipate.

EDI IS NOT ONLINE ACCESS — because this is interactive, and involves the intervention of an individual to direct the operation of the remote computer.

AND IT IS NOT EMAIL — because email messages are unstructured text strings, the format of which cannot be anticipated by the receiver.

RATHER, EDI is characterised by the batch file transfer of data in a highly structured and standardised format.

The Exchange Of Information Without EDI

Fig. 4 illustrates the way in which most business is presently transacted. Typically, a library, having decided to purchase an item, enters details into its computer system. This system then generates a paper purchase order, which is despatched by post to the supplier. The supplier, in this case a subscription agent, receives the purchase order and keys the details into their computer system. This system in turn generates an invoice, which is then posted to the library — and no doubt details of the invoice are keyed into the library's accounting system.

Post Van etc

This is a circular process where much the same information is repeatedly keyed into a library or subscription agent's computer system. Similar repetitive, circular, flows of data go on between the agent's system and the publisher's system.

Studies of industry in general show that 70 % of data that is keyed into one computer comes from another. Furthermore, these studies have shown that there is a 5% error rate when data is re-keyed. In industry as a whole, the cost of employing people to re-key data constitutes 30% of total data processing costs.

The illustration (Fig. 4) represents the world without EDI and highlights some of the duplication of effort and associated costs that are involved. So how would these same transactions be processed in an EDI environment ? (Fig. 5)

In simple terms EDI bypasses the double entry of data and the use of the postal system by allowing computer applications at both ends to exchange data directly without human intervention.

There are several benefits that can be realised by the systematic implementation of EDI. It is worth noting here that the subscription agent's computer system can only communicate to the library's computer if they are using an agreed standard. The same, of course, applies when the subscription agent's system is trying to exchange data with the publisher's system.

Benefits Of EDI

The benefits of implementing EDI fall into two groups; tangible and intangible, the first fairly easily quantified and the intangibles less so.

TANGIBLE BENEFITS — The first tangible benefit is achieved through the reduced paperwork and associated savings, in particular:-

> **The savings associated with one-time data entry — reduced error levels and improved error detection.**
> **Benefits flowing from the on-line storage of data delivered electronicall·· means, there is no technical reason why a paper copy of a transaction need be produced. Online storage of transactions means management reports can be generated faster because all of the data is readily available to the organisation's Management Information System.**

Reduced postal charges and reduced clerical workload, which may lead to higher productivity without increasing staff.

The second main benefit is of speed.

The rapid exchange of information enables an organisation, be it a library, agent or publisher, to get a more up to date view of any given situation. For instance the publisher's ability to rapidly notify the agent or library of publication delays, is a clear benefit to all concerned, since it prevents unnecessary claiming activity.

The third tangible benefit occurs when uniform communication with all trading partners is achieved.

If this is achieved it allows any organisation to have uniform, standardised communication with all its trading partners, be they suppliers, customers, postal or freight companies and even banks.

INTANGIBLE BENEFITS — The intangible benefits flow from the tangible ones. Clearly, if you have more accurate and up-to-date information with the implementation of EDI, then this will improve your ability to deliver high quality customer service, whether you are working in a publishing house, subscription agency, or library. The better the customer service you deliver the more likely you are to retain customers, be they users in your library or libraries themselves.

In order to achieve these benefits there are a number of issues that need to be addressed and, of these, the issue of standards is particularly significant.

Need For Standards

So why do we need standards? Well simply because, while the content of business transactions

is often the same, the layout of the data varies considerably.

With invoices, for example, the content of one invoice will be much the same as another. All invoices have invoice numbers, line items such as the journal title, and amounts, both on every line of the invoice and a total amount. So the informational content of one invoice is much the same as another; the structure and layout, however, can vary enormously.

This is acceptable as long as human intelligence is deployed to analyse, process and re-key this data. If however, we wish to by-pass this exercise, then some standards must be defined so that the computers at each end of the EDI link can process this information. The computer has to "know" that the next number it is processing is an invoice number and not the invoice total. I don't need to spell out the mayhem that would result if this distinction could not be made.

So if we have identified why we need standards then what kind of standards are there to choose from.

Types Of Standards

Fig. 6 illustrates the four or five main types of standards from the specific to the generic.

At the top is the proprietory standard — an example would be Blackwells default invoicing standard. Here an organisation, in this case BH Blackwell, has defined a standard format for a machine-readable invoice. I'm sure all the other major subscription agents also have such default formats. Although convenient for the agent, the library system vendor has the problem of developing a number of different software interfaces in order to load invoices from the different agents. This is simply because there is no agreement among the agents as to what an invoice should look like.

The second type of standard is really only the reverse of the first. In this case the library systems vendor develops a set of software for loading invoices, and then issues a standard format to the subscription agents, and requests that machine

readable invoices for that library system be laid out according to their specified format. This approach still involves wheels being reinvented. In this case it is the subscription agents that have to develop different invoicing software in order to accommodate the different formats defined by the different library systems vendors. Once again there is no agreement among library system vendors as to what an invoice should look like.

The third type of standard — the industry standard — seeks to overcome this by gaining agreement within an industry as to how a transaction should be defined. An example is the renewal order standard, finalised in 1989, by the *International Committee on EDI for Serials* (I.C.E.D.I.S.). This standard defined a layout for renewal orders sent from agents to publishers. This has now been generally accepted in the industry and allows the major agents to send their renewal orders to all the major publishers on magnetic tape. This has reduced the amount of keying carried out by the publishers, and has reduced errors.

The last two areas, indicated in Fig. 6 as being true EDI standards, extend this idea of industry-wide agreement to its logical conclusion.

Instead of simply agreeing an invoicing format for use between, for instance, all subscription agencies and all library systems, national and international EDI standards seek to extend the constituency from one specific industry to all industries.

In the case of a national standard this constituency is extended to all industries in one country, and in the case of international standards, to all industries anywhere.

Once in place and accepted, use of these standards can have profound commercial implications. In the USA, for instance, many of the major corporations insist that all supplier's invoices conform to the American National Standard. It doesn't matter whether you are selling them journals, computers or company cars, all invoices must conform to the same national EDI standard.

All the major initiatives in the serials industry are now taking place within the overall umbrella of national standards, specifically under the umbrella of the ANSI X12 set of standards. However ANSI

is not the only standards making body. Fig. 7, labelled **EDI Standards And Their Sponsors,** illustrates the other main standard-making bodies and their sponsoring bodies.

The name on the umbrella is that of the sponsoring body and beneath the umbrella is the name of the standard-making body. Firstly, the American National Standards Institute (ANSI), rather like the BSI, it develops and sets standards for a host of products and services. The ANSI body that is most relevant to the serials industry is the Accredited Standards Committee number X12 which develops uniform standards for inter-industry, electronic interchange of business transactions. All the major initiatives within the serials industry are being undertaken using this set of EDI standards. The equivalent UK standard is Tradacom whose sponsor is the Article Number Association.

Last, but not least, the only truly international standard is the EDIFACT set of EDI standards sponsored by the UN Economic Commission for Europe. Although it has not got the same number of defined and established transactions, as has X12, it does have the advantage of being designed for true international use. I expect that X12 and Tradacoms sets of standards will, over time, migrate to the EDIFACT standard.

The two bodies actively defining standards in the serials industry are; I.C.E.D.I.S. — the International Committee on EDI for Serials, and S.I.S.A.C. — the Serials Industry Systems Advisory Committee. Both have decided to use the ANSI X12 standard.

In Fig. 8, **Who Defines Standards Within The Serials Industry,** S.I.S.A.C. is placed more firmly under the X12 umbrella than I.C.E.D.I.S. because it is officially affiliated through its membership of the Book Industry Study Group. It is also a NISO member whereas I.C.E.D.I.S. has no official relationship with either NISO or ANSI. I must also refer to the work of BEDIS because this has been the organisation most active in EDI standards development for book related transactions using the Tradacom set of protocols. If you are interested in implementing EDI for both books and journal

transactions, then you will have to support more than one standard, at least in the UK.

This situation is mitigated somewhat by the availability of commercial EDI software packages that can translate between X12 and EDIFACT standards, and possibly into Tradacom in the future.

The International Committee On EDI For Serials

I.C.E.D.I.S. consists of equal numbers of publishers and agents, and finalised in 1989 the Renewal Orders standard. This is an industry standard that allows for the rapid and error-free automatic renewal of subscriptions. The committee meets three times a year, with additional technical working parties being convened on both sides of the Atlantic to draw up draft maps of the various transactions under consideration. Currently under test is the despatch data map using the X12 856 transaction set.

Under development is an 832 transaction set which will be used for transmitting price lists and price amend-ments between publishers and agents. The committee is intending to map claims, orders and shipping address changes in the near future. The primary orientation of I.C.E.D.I.S. is towards automating transactions between publishers and agents.

This is illustrated in Fig 9. I have also tried to illustrate here the function of the X12 translation software. In summary, although EDI standards define the shape and structure of the data while it is being transmitted from one organisation and another, it does not determine how an organisation's data is held and manipulated within that organisation's local application. The availability of commercial, off-the-shelf translation packages means that it is necessary only to map the data from the internal application to the agreed and defined X12 map using this software.

Serials Industry Systems Advisory Committee

The second body that has recently embraced X12 as the preferred EDI standard is S.I.S.A.C. — the

Serials Industry Systems Advisory Committee. Affiliated to ANSI X12, S.I.S.A.C. has a broader membership than I.C.E.D.I.S., and is made up of librarians, subscription agents, publishers and library systems vendors.

It has a slightly wider remit than I.C.E.D.I.S. and, as Fig 10 shows, is currently mapping all the major transactions that are exchanged between agents, publishers and librarians. Once again X12 translation software will be used to map the standardised data contained in the X12 transaction set to the internal data structures of the organisations participating. I.C.E.D.I.S. and S.I.S.A.C. are intending to hold a joint meeting in the USA during Summer 1991 where discussions will centre on ways in which we can coordinate our efforts.

For more information on the activities of either of these bodies please contact:

Brian Cox (Chair)
c/o I.C.E.D.I.S.
Pergamon Press Ltd
Headington Hill Hall
Oxford
UK.

Tel: 0865 743355
Fax: 0865 743911

Tina Feick (Chair)
S.I.S.A.C. 2402
c/o Blackwells
324 Main St
Cold Spring
New York. NY 10516
USA

Tel: 914 265 2304
Fax: 914 265 2402

Organisations Involved in Data Interchange
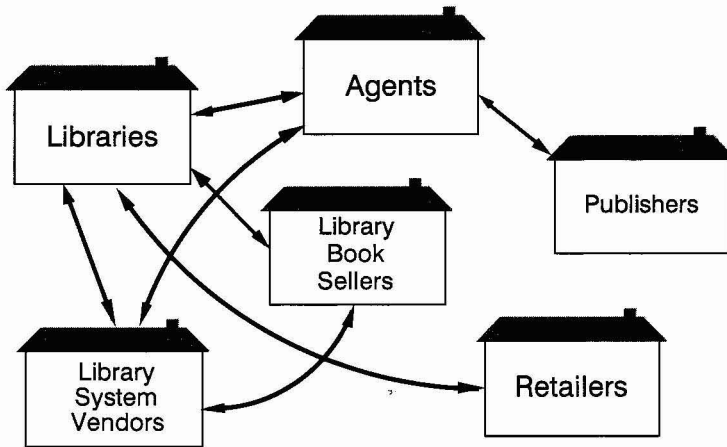

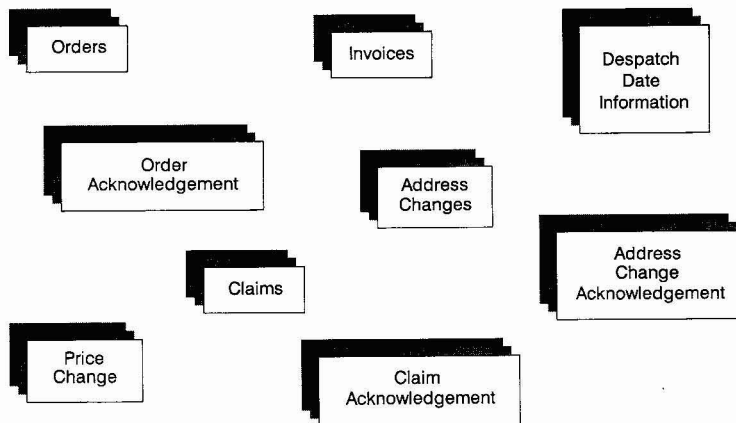*Figure 2*

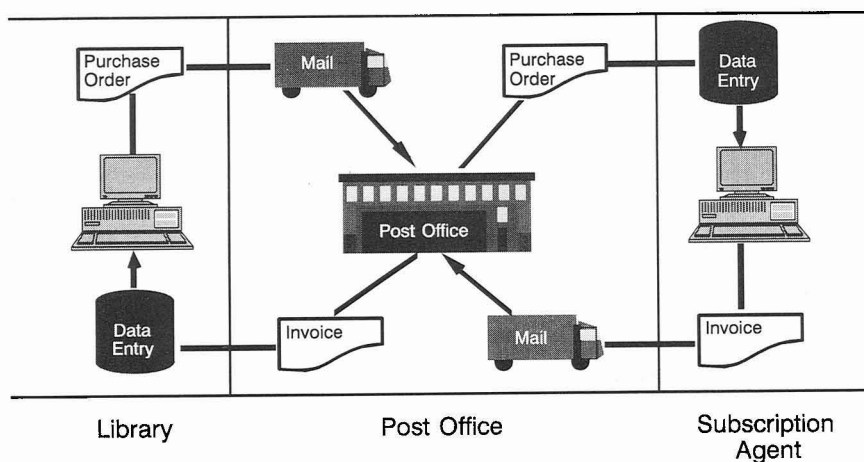## Typical Data Transfer in the Serials Industry
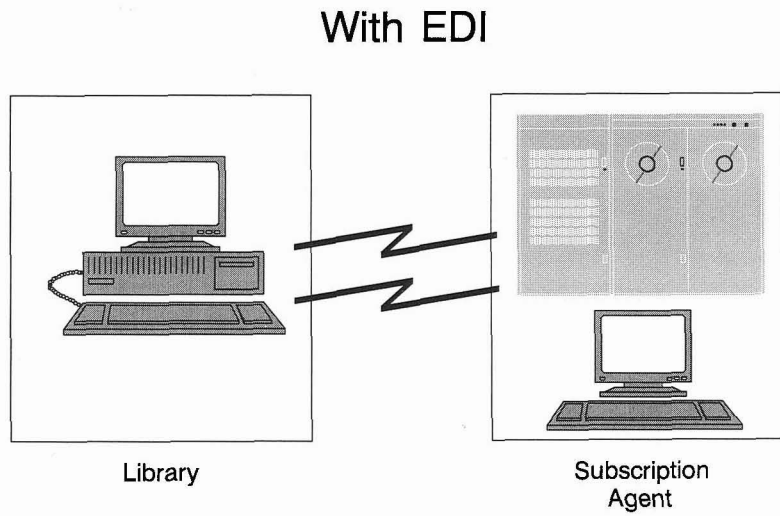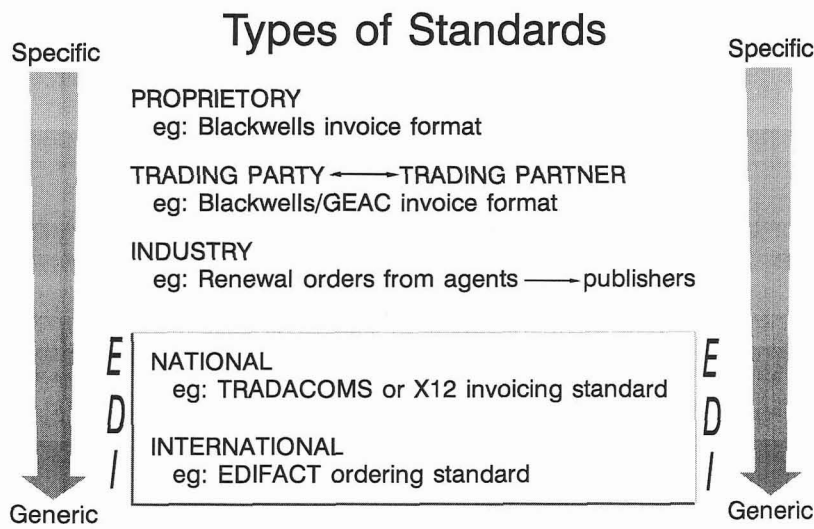

Figure 3

Without EDI

Figure 4

Library   Post Office   Subscription Agent

With EDI

Library   Subscription
                                 Agent

Figure 5

Types of Standards

Specific   Specific

PROPRIETORY
   eg: Blackwells invoice format

TRADING PARTY ◄──────► TRADING PARTNER
   eg: Blackwells/GEAC invoice format

INDUSTRY
   eg: Renewal orders from agents ──► publishers

Figure 6

E | NATIONAL   E
D | eg: TRADACOMS or X12 invoicing standard   D
I | I
  | INTERNATIONAL
  | eg: EDIFACT ordering standard

Generic   Generic

EDI Standards and their Sponsors

American National
Standards Institute

Accredited
Standards
Committee
X12

United Nations
Economic Commission
For Europe

UN/EDIFACT

Article
Number Association

TRADACOMS

Figure 7

Who Defines Standards within the Serials Industry

American National Standards Institute

X12

National Information Standards Organisation

JSC/IWPMMT (International Industry Association)

Article Number Association

TRADACOMS

SISAC (US Industry Association)
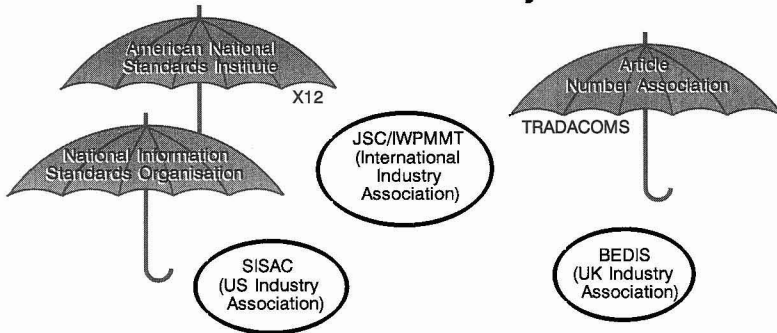
BEDIS (UK Industry Association)

Figure 8

BEDIS = Book Trade Electronic Data Interchange Standards Committee
SISAC = Serials Industry Systems Advisory Committee
JSC/IWPMMT = Joint Serials Committee/International Working
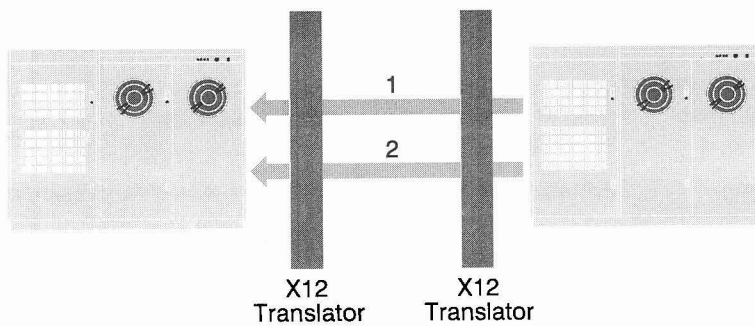Party on Magnetic Media Transfer

JSC / IWPMMT

1

2

Figure 9

X12
Translator

X12
Translator

1 - Journal despatch data - 856
2 - Price changes - 832

SISAC X12 Activities

PUBLISHER

LIBRARY SYSTEM

Figure 10

SUBSCRIPTION AGENT
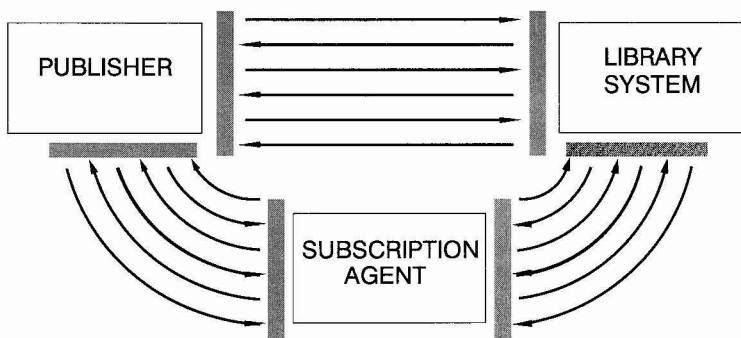
Orders (850)   Claims Response (870)
Order Acknowledgement (855)   Cancellation
Invoice (810)   Cancellation Response
Claim (869)