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Document Delivery—Past, Present and Future

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1. GENESIS

The origins of document delivery, as the term came to be known, is from an inter-library loan and photocopying service for journal articles, offered by libraries largely free of cost. For long, it remained a passive and co-operative service spear-headed by library networks as part of their resource sharing plans. British Library Document Supply Centre (BLDSC), UK was the only organisation which extended the service from journal articles to conference papers and other documents such as theses, dissertations and reports. The service evolved and grew in demand with the gradual increase in the usage of bibliographic databases. For the first time, *Current Contents* published by the Institute of Scientific Information (ISI), USA expanded the scope of document delivery outside the library networks by providing a means for direct contact between the user and the author or publisher. As a database producer, when ISI introduced Original Article Tearsheet Service, (now called Genuine Article Service), it set the frame work for legalising document delivery and respecting copyright by setting up a system for paying royalty to the publisher for every article delivered to the end user. Taking clue from ISI, many database producers started offering document delivery service (DDS) as a supporting service for the documents covered in their databases. Today most database producers offer DDS though very few of them operate it as a serious business.

2. ONLINE ORDERING

As databases went online, the online hosts like Dialog who commanded the centralised bibliographic access as a kind of information super market, realised the need for supporting their clients in obtaining complete articles. In the early days of online, computing and storage costs being high and limited, delivering documents online was unthinkable. What the companies like Dialog did was to provide an online ordering service for full documents or articles available from a select list of document delivery vendors. Dialog called this service DIALORDER and released *Yellow Pages of Document Delivery Vendors* which included many national libraries, database producers and third party suppliers. Today, Dialog's list of DIALORDER suppliers includes about 100 companies and organisations. The concept of online ordering pioneered by Dialog using document delivery agencies as back-up for fulfilment, operated in an electronic mail environment developed internally by Dialog. For ordering a document, required the user is required to have a prior agreement or deposit account

with the document delivery agency. For instance, one can order for an article from BLDSC or for a PhD thesis from UMI through DIALORDER (INSDOC is also providing such a service except for the technology element of bibliographic access and online ordering missing). Also, in this model, Dialog did not play the role of supplier; it simply provided a means for online ordering. With vast spread of networking technology today, online ordering is directly supported by document delivery vendors.

2.1 BLDSC's ARTTel

Delivering more than 35 lakh articles every year, British Library Document Supply Centre leads the document delivery market. BLDSC introduced its online ordering service called ARTTel (Automated transmission requests through telecom) during last 80s. Currently, 52.8% requests are received by BLDSC through ARTTel and another 13% requests are received through other electronic media such as fax and database hosts. Only 34% of the requests are received by post which is losing its share. ARTTel can be accessed through GPSS, Internet, Janet, Sprintnet and many other global data networks.

3. FAX DELIVERY

Online ordering reduced the transit time in ordering from about ten days to one day and facilitated faster order processing. The transit time for delivery of documents still remained with the mercy of postal system until fax delivery was introduced during the late 80s which earned limited popularity. Fax delivery was expensive for developing countries particularly for India and continues to be so for international deliveries, as fax uses regular phone lines. In USA, it is widely becoming popular due to low telecommunication cost.

3.1 Limitations

The document deliveries through fax suffer from three major limitations:

- Even today, most of the documents are not available in electronic media. Electronic Journals are only a recent phenomenon and only a small percentage of scholarly and technical journals are available in electronic form. Hence, the logistics of material handling and the associated manpower costs still continues. Most bound volumes simply cannot be used by conventional fax machines, and require scanning or photocopying before delivering the pages to fax machines. In BLDSC the major cost is still attributed to the physical process of picking up the journal from the shelves, copying or scanning for e-mail or fax delivery and shelving back the volumes.
- Fax, as said earlier, is still expensive. While it is cheaper to own a fax machine, the cost of telephone lines makes it prohibitive in India. For instance, sending one page document from Bangalore to Delhi takes about a minute and will cost approximately Rs 40/- towards telecommunication charges alone.
- The quality of delivery depends on the reliability of network telephone.

3.2 Network FAX

The drive for economy in using telephone for computer communication gave rise to development of data networks. While telephone still remains the link at the user end, the data networks have become inexpensive interface between the user's telephone and the service providers like online hosts and e-mail systems. The fax technology today can successfully interface with data networks. This will make the fax delivery as economical as e-mail delivery of documents in the near future. Network

faxes are already operational in many parts of the world. The offices abroad are extensively using this system. They pool and send their fax messages to a local network centre which manages the network delivery of fax. For a user, it effectively becomes a local fax call plus a small additional fee for transmission outside his city.

As Internet became popular, many projects were initiated by various libraries to fax articles through Internet. The Academic Computing Services at Ohio State University, USA has developed an Internet-fax gateway that can be used with the existing Group III fax machines. The project is called Network Fax Project. The Research Library Group (RLG), USA developed Ariel, a software solution that uses existing hardware. It is capable of both sending and receiving documents directly and is commercially available.

The emerging ISDN technology provides for natural interfacing of telephone with fax technology. It has dramatically increased the delivery (transmission) speed and reliability and allows for very high quality (zero-error) delivery of documents. Further increase in speed from the current 4800-9600 bps to several kbps is expected to bring down the cost transmission current technology takes about 6-8 minutes to receive a 10 page article by fax. With ISDN technology and high- speed fax-modems it should take less than 30 seconds to receive the same 10 page fax.

4. ONLINE ACCESS AND ONLINE DELIVERY

The services like Dialog's DIALORDER facilitated only online ordering but the delivery was off-line, either by mail or fax. This was because the databases available were largely bibliographic. Electronic journals started their entry into online market due to declining storage costs and increasing computing power. American Chemical Society was one of the earliest to offer full text of all its journals as an online database for searching and delivery. This was accelerated by Dialog by the addition of more full text online databases. *Full text Sources Online,* a directory published by Bibliodata (1994), lists over 5,000 journals and newsletters available online through various online hosts. Dialog alone offers full text of over 3000 journals and magazines online, largely in business area. The trend is towards full-text databases with the option for DD either online or through fax or e-mail.

5. FULL TEXT VERSUS FULL DOCUMENT

What the online companies deliver as full text online is only a part of the document available as ASCII file for searching and delivering. If the articles contain images and graphs, they are rarely found in the full-text databases. Images require 25 to 100 times more storage space than text files which makes the cost of storing and delivering more expensive. Most online companies still deliver data at a maximum speed of 9600 bps and most users still use 1200/2400 bps modems. These are serious limitations for online delivery of full document with images and graphics. Current developments in the following three areas, which may take at least another 3-5 years to reach consumer level, will make online databases move from full text to full document:

- ISDN technology for networking and data communication
- Storage and compression technology for large volume disc storage
- Modem technology

Here too, the trend is visible. Dialog started delivering images since 1988 with

two databases—Trademarks Scan, and Chapman & Hall Chemical database. Recently, Derwnet made available the images (drawings and diagrams) for its World Patent Index Database through three major online hosts. STN has recently started offering complete journals of the ACS, both text and images, online.

6. CD-ROM TECHNOLOGY

CD-ROM has emerged as the cheapest storage medium for large volume storage and publishing. More full text/full document databases are available on CD-ROM than on online. Full-text databases of journal articles on CD-ROM are of two types:

- o ASCII files of text and scanned images of graphics linked to the text.
- o Complete scanned image of text and graphics supported by bibliographic file linking each article.

The first type is ideal and cost-effective, but the second type is easier to produce. Most full-text databases of journals available on CD-ROM are image files (the second type), including ADONIS, UMI's IEEE/IEE On disc, etc which can be called Document Delivery Products. ADONIS has a royalty payment system added to its subscription price. For every article printed, the subscriber pays a royalty to ADONIS which is shared with journal publishers. IEEE/IEE On disc does not levy any royalty but the subscription price of the product is high enough to compensate for the royalty loss to IEEE/IEE. While ADONIS covers journals of a few hundred medical publishers, the latter covers all the journals of IEEE and IEE only.

CD-ROM is a good archival medium, but it cannot be a total substitute for subscribing to current journals in printed form. However, it is a very convenient technology for document delivery. With CD-ROM publishing going desk-top and becoming cheaper, even the individual libraries can plan for converting their back volumes into CD-ROM masters and can develop a high quality true-to-original document delivery system.

Some of the current journals like *Journal of Biological Chemistry* have also started publishing a CD-ROM version parallel with the print edition. This visible trend of primary journal publishing on CD-ROM is yet to become a publishing culture.

7. REMOTE ACCESS DOCUMENT DELIVERY SYSTEM

The integration of online, CD-ROM and fax-modem technologies has set a new high-tech trend in document delivery, which can be called Remote Access Document Delivery System (RADDS). It combines the benefits of online searching, online ordering, CD-ROM and fax technologies for network delivery. Dialog SourceOne and Carl's Uncover are examples of RADDS, which work on the following lines:

- o Search a database online
- o Identify the articles or patents of your choice
- o Login to the Dialog SourceOne database
- o Order for the selected article(s) for fax delivery (or e-mail in future) giving fax number to which the document should be delivered

The order is transmitted by Dialog SourceOne to a CD-ROM storage system which has the complete image file of the document. The CD- ROM storage system controlled by a file server picks up the ordered item(s) and transfers it to a computer controlled fax machine which automatically dials and delivers the document instantly to the customer.

The entire system is computer controlled, operating in a network environment which guarantees fax delivery within minutes.

7.1 Technology for RADDS

The hardware for setting up RADDS includes file servers, networks, CD-ROM storage systems (Juke-boxes) and computer controlled fax machines. The critical factor is the software and system integration for transferring scanned and stored images and text to fax machines for automatic delivery.

Many software are available, the notable ones being 'XpressNet' by Article Express International and 'Ariel' by Research Libraries Group. This technology brings a big opportunity for large libraries and emerging library networks to experiment and setup RADDS in India.

8. CONCLUSION

Document delivery is the logical end to a bibliographic information system. A large part of the document delivery needs are met by libraries at local and national level with fully or partly subsidised deliveries. Application of IT will make document delivery faster, more effective and visible. As it becomes more visible, copyright clearance will became a serious issue. Users will certainly benefit by direct fast access to 'real information' as against bibliographic surrogates. Technology trends are very encouraging for the document delivery process to go completely electronic. But, someone has to bell the cat for the initial investment on technology and the market should be willing to support and promote it.