An Introduction to the Structure of ANSI X12 and a Tutorial on X12 Mapping for Serials Related Transactions

Christopher Beckett, Fritz Schwartz, Sharon Cline McKay & Joseph Barker

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Christopher Beckett
Fritz Schwartz
Sharon Cline McKay

Workshop Leaders

Joseph Barker

Recorder

Christopher Beckett, Product Manager, Blackwell's Periodicals Division, opened the workshop with an overview of the ANSI X12 standard. Its purpose is to facilitate EDI (electronic data interchange), the computer-to-computer exchange of structured business documents between an enterprise and its vendors, customers, and other trading partners. For serials librarians, EDI can provide a link between their serials control systems and the systems of serials agents; serials agents will use EDI in their transactions with libraries and publishers. EDI could handle ordering, status reporting, invoicing, price changes, claiming and claim responses, and address changes (as well as confirmation of each of these). EDI can eliminate much costly re-keying and evaluation of data. The ANSI X12 standard overcomes the variations in format or layout used by the systems of each partner in these interchanges. The X12 standard resembles a sequence of envelopes in successive sizes, each within

Joe Barker is Acquisitions Librarian, University of California at Berkeley, Berkeley, CA 94720.

another, with the possibility of more than one envelope of the same kind tucked into the next-larger envelope. The smallest unit is the "data element," that is, an ISSN, a title, an address, a price. Related data elements (perhaps an invoice line) are assembled in "data detail segments," surrounded by a header and a footer identifying and delineating each one for the receiving computer. Similar data detail segments are grouped together next in packets called "transaction sets," each with a header and footer. Like transaction sets are in turn grouped together in larger bundles called "functional groups," each with appropriate identifiers and delineating codes. One or more similar functional groups are enclosed in an even larger "interchange envelope," again with header and footer. Finally all the interchange envelopes to be transmitted at one time are enclosed in a "communications session," with a header and footer bearing "communications transport protocol" that describes vital information about the originating computer, such as the software, hardware, version of X12 used, and network and computer addresses. This information enables the receiving or "target" computer and the intermediary networks and software to perform the necessary conversions and adaptations to transmit, receive, process, and respond to the communication.

Fritz Schwartz, Manager, EDI Group, The Faxon Company, led the group in a mini-tutorial on mapping data into X12. He identified facts necessary before beginning mapping, including the purpose of the information to be interchanged, limitations of the source and target systems, the availability of machine-readable data from the sender and the desirability of machine-readable data for the receiver, and the version and release of X12 used at each end. To make X12 easier to understand, he compared its structures with the structures of human language: ASCII text used by computers corresponds to the characters within words of human language; data elements correspond to words; data segments to sentences; transaction sets to paragraphs; transaction envelopes to discussions; and the rules or syntax of X12 to the syntax of human language.

Four interchange standards exist within X12. The "data dictionary" standardizes terms used in X12. The "segment directory" is a vocabulary for describing and parsing headers, data, and footers within any data segments. "Transaction set" standards lay out the

possible ID tags for all of the kinds of data within a transaction set (consisting of data segments and a header and footer). The transaction set represents an action to be taken, not an object, and can be compared to the verb in a sentence. Transaction sets can "loop" or repeat a set of actions on like data until it is all processed. "Transmission control standards" establish commonly understood communications on interchanges and systems. Schwartz distributed excerpts from the X12 standard, but time did not permit the group to go through the hands-on mapping of sample data into X12.

Sharon Cline McKay, Director of Library Services, Corporate Division, EBSCO Subscription Services, outlined general issues surrounding ANSI X12. She pointed out that X12 was developed with commerce in mind. It is market-driven and more practical than theoretical, because it has the economic purpose of facilitating commercial transactions. Compromises may be accepted in order to get transactions flowing, with the expectation that subsequent modifications can and will be allowed.

The committee (ASC X12) that developed the X12 standard is oriented primarily to U.S. commercial activity, but does not operate in a vacuum. It is fully accredited by ANSI (American National Standards Institute) and has over 150 sub-committees working on different aspects of the standard. This committee coordinates with ANSI/NISO (responsible for Z39 standards through BISAC and SISAC) and has loose ties with the International Committee for Electronic Data Interchange for Serials (ICEDIS), which is involved in standards for magnetic media transfer, and the British Book Industry Communication committee (BIC).

EDI communications require technological support from networks and translation software. Telecommunication is assumed, although magnetic media are sometimes used. Value-added networks (VANs) are almost always used in EDI. A VAN is used like a mailbox. Messages are sent to the VAN from the source computer and stored there until called for by the target computer. Between each computer and the VAN, translation software copes with variants caused by updates to X12 and harmonizes communications between the computers. VANs and translation software packages are significant cost factors for serials agents, other library materials vendors, libraries, and library systems vendors as each enters the EDI arena.

However, staff savings and increased speed are expected to offset these costs in a series of trade-offs.

Questions and answers focused on the potential for X12. Asked what library systems vendors are doing about X12, Fritz Schwartz answered that they are all becoming active in the X12 arena at different rates and to differing degrees. In response to a question about the relation between SISAC and X12, Schwartz said that SISAC never finalized a Z39 standard format for serials orders, claims, cancellations, etc., but some of the elements defined in that draft standard are being translated into the X12 formats. Since X12 is an inter-industry standard, the rate of development varies for different business sectors.