

Standards for Information Display

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THIS PAPER WILL DISCUSS standards regulating how information is formatted and presented to the end user. The emphasis is on the presentation of text and bibliographic information in data entry, interactive processing, information retrieval, report preparation, and library settings.

Video Display of Information

Video display is the "soft" display of information other than in "hard" copy on paper. This includes video display units (VDUs) such as cathode-ray computer terminals, plasma panels and video discs. Microfilm formats are also covered in this section.

Display Standards and the Marketplace

At a key meeting on library automation standards held in June 1981 it was noted that standards for graphic display of bibliographic data were not available and should be developed.¹ It is becoming more and more apparent that improvement of the user interface is reaching a point of urgency: "because the type of user typical of a computing system is changing rapidly. The far less experienced user who will soon make up the principal proportion of all users will have, it appears, even greater dissatisfaction with existing computing systems and their dissatisfaction is likely to become rapidly more vocal."²

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Library and information systems that begin to apply effective presentation format standards or guidelines will very likely become leaders in the field. "Human convenience is known to be a major factor in many areas for determining buying of products and continued use of repetitive services. There is every reason to expect a successful assault on this area to result in an increased market share...."³ Reinforcing this idea, Smith, Vice-President of Technology for CBS, Inc., has said that it takes a standard to create a market.⁴ Without some standardization, the marketplace becomes fragmented. Information services and products will not break through on any large scale unless the user is assured of easy, trouble-free use. It is, therefore, important to standardize various aspects of the presentation format component of library and information systems to the extent to which they will meet the requirements of the majority of potential users.

Video Display Standards

A review of the literature on standards for video displays indicates the obvious absence of standards for system designers. "While standards involving technological factors have been successfully developed and implemented, those involving human factors, policy, and management prerogatives still lag behind."⁵ Granda of IBM Corporation has assessed the situation quite well: "For the most part, the aim of computer system design and development effort is the optimization of system performance. Users are only one part of the overall system architecture; and they are not often considered the most important part."⁶

Historically, research efforts have resulted in a preponderance of theories concerning human psychology (see reports of studies by Archer,⁷ Coffey,⁸ and Eriksen⁹), but little effort has been made to translate the theories into practical guidelines. In the majority of those cases where guidelines have been developed, they tend to be qualitative and not quantitative.¹⁰ However, a new trend of increased attention to human factors is beginning. Human factors "are mentioned with increasing regularity in the computer industry as operators, system planners, union management, government agencies and equipment manufacturers struggle to assess the physiological and psychological impact computers have on the people who use them."¹¹ The international academic human factors community in Germany and the Scandinavian countries, and large equipment manufacturers like IBM are taking the lead in the development of standards and guidelines.¹²

A good detailed guide for the design of interactive computing system displays was developed by Engel and Granda at IBM.¹³ The

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authors make specific recommendations about display frame layout, frame content, command languages, error prevention and recovery, response time, and behavioral principles. For the most part, their guidelines are based on observable, reported evidence and are measurable. However, Engel and Granda state quite clearly that their guidelines are not standards. Although designers are encouraged to follow them, software or hardware constraints may force tradeoffs in certain situations.¹⁴

Several authors have attempted to set down design "principles." Morse¹⁵ has derived several principles for the effective display of data from the human factors engineering literature on instrumentation displays. His two key principles are the principle of proportional effect and the principle of least effort. Similarly, Stewart¹⁶ has identified six factors that contribute to good display design. They are: logical sequencing, spaciousness, relevance, consistency, grouping, and simplicity.

In several European countries there are efforts underway to establish human factors standards for the design and use of visual display terminals. Most of the standards are aimed at ergonomic considerations like keyboard layout, work-station environment, radiation hazards, and lighting requirements. However, the Deutsches Institut für Normung (DIN), which is the German standards organization, is now working to develop standards for the display of data on terminals.¹⁷ Draft DIN Standard 66234, "Characteristic Values for the Adaptation of Work Stations With Fluorescent Screens to Humans," does cover several aspects of data display format; "it is the intent of the German standards group to propose the final draft of this material for consideration as an ISO standard."¹⁸

Videotex Standards

In May 1981 AT&T issued a Presentation Level Protocol (PLP) for videotex. The proposed standard governs the display of computer-encoded textual and graphic information. "This protocol conforms to the architecture defined in ISO's multi-layered reference model of open systems interconnection, and is one of seven protocol specifications that would be required to completely define a videotex standard."¹⁹

In November 1981 AT&T proposed a Session Level Protocol (SLP) standard. The Session Level Protocol defines how to set up and terminate sessions.²⁰ The SLP contains a very useful feature which allows a user to suspend one display session—holding all information from the session unchanged—and initiate another session. When the second session is completed, the user can then return to the suspended first session.²¹

Since the provisional Session Level Protocol is at this writing only three months old, acceptance of it is unclear. "The key issue here is the fact that nobody else has arrived at a point in their thinking whereby a Session Level approach to videotex can be coherently defined. AT&T has stolen the march on everyone in this respect...."²²

By developing a Presentation Level Protocol and a provisional Session Level Protocol, AT&T has assured itself a position of leadership—perhaps an insurmountable position—in the videotex industry. The PLP format allows the transmission of pictures and figures in enormously compressed form. This in turn allows the transmission of high-quality graphics over low-speed or moderate-speed data lines.²³ Although none of these proposals have been accepted by any standards organization, they may well become *de facto* standards. Through the introduction of these proposals, AT&T seems to have shifted the balance in videotex services toward telephone network-based systems.

Microform Standards

To date, very few nations have adopted microform standards, and where standards have been adopted, they depend upon voluntary participation. Allan Veaner summarized quite well the driving force behind acceptance of microform standards: "In the long run, standards get accepted because everyone recognizes an advantage to them: results are better, cheaper, more consistent; products and information are interchangeable."²⁴

In the United States, the National Micrographics Association (NMA) produces industry standards, and the American National Standards Institute (ANSI) produces national standards. Usually, industry standards are submitted to ANSI for consideration as national standards.

There are three ANSI standards concerned with microform presentation format. Two levels of detail are addressed. ANSI PH5.9-1975, "Microfiche of Documents," addresses the physical characteristics of microfiche reduction: pagination, frame identification and quality requirements for resolution and reproducibility. Comparable considerations for COM-produced microfiche are dealt with in ANSI/NMA MS2-1978 (formerly ANSI PH5.18). This standard addresses computer output microforms (16mm and 35mm roll film and microfiche products). Specifications are included for dimensions, reduction and magnification ratios, image orientations, film travel, and reserved areas for image coding.

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ANSI Z39.32-1981, "Information on Microfiche Headings," addresses standardization on a level below that of the previous two standards. It specifies the minimal set of eye-legible information that should be included in microfiche headings. The following areas are defined: location, order of elements in each location, size of type, and contrast between character and background. The purpose of the standard is: "to specify the elements necessary or desirable for basic identification and retrieval. Additional bibliographic information for other purposes, for example, ordering and cataloging, may be given in the microimage area."²⁵

Printed Display of Information

This section covers standards related to the presentation of information in hard copy, printed on paper. It should be kept in mind, however, that with the proliferation of video terminals, many of these standards could be profitably employed when designing presentation formats which will be primarily displayed on computer terminals. In fact, the increasing resolution and capabilities of video terminals will gradually narrow the difference between what can be printed and what can be displayed in "soft" copy. Many publications now available only on paper may well migrate to video with little change in their design.

In contrast to standards for video display, the standards discussed here are usually only slightly concerned with legibility requirements. If mentioned at all, these standards will cite a minimum type size, as in "Guidelines for Format and Production of Scientific and Technical Reports: 3.1.1 Size of Type." "The size of type used...should provide for final page copy...at least as large as 8-point type. Ten-point type, or the equivalent, is recommended."²⁶ Other legibility requirements are limited to general guidelines for illustrations in ANSI Y15.1-1979.

Two types of material are covered by these standards: primary and secondary. Standards related to primary materials include ANSI Z39.1-1977, "Periodicals—Format and Arrangement," and ISO/R 8-1954, "Layout of Periodicals." These standards are considerably shorter and more straightforward than those describing the layout of secondary material which are references to primary material. Secondary material standards are typified by ANSI Z39.29-1977, "Bibliographic References."

Standards Relating to Primary Materials

These standards are fairly simple and seem to be directed at two distinct groups—publishers and authors. Standards designed for pub-

lishers typically consist of one or two pages of definitions of terms followed by a few, usually fewer than five, pages of recommendations. ANSI Z39.1-1977, "Periodicals: Format and Arrangement," mentioned above is a good example. It gives short, one- or two-sentence definitions of some sixty-two terms ranging from *article* to *zip code*. The recommendations follow in eleven sections:²⁷

- 3.1 Title—content and display, 3.2 Cover and Spine,
- 3.3 Table of Contents,
- 3.4 Masthead,
- 3.5 Pages,
- 3.6 Articles in Installments,
- 3.7 Instructions to Authors,
- 3.8 Supplements,
- 3.9 Volumes,
- 3.10 Changes or Irregularities, and
- 3.11 Translation Periodicals.

The standard then ends with references to several other ANSI and ISO standards.

Some other standards which fall into this same category of recommendations for publishers are:

1. ANSI Z39.6-1965(R1977), "Trade Catalogs;"
2. ANSI Z39.13-1979, "Describing Books in Advertisements, Catalogs, Promotional Materials, and Book Jackets;"
3. ANSI Z39.15-1980, "Title Leaves of a Book;"
4. ANSI Z39.26-1981, "Advertising of Micropublications;"
5. ANSI Z39.41-1979, "Book Spine Formats;"
6. ANSI Z39.31-1976, "Format for Scientific and Technical Translations;" and
7. ISO/R 215-1961, "Presentation of Contributions to Periodicals."

These standards try to encompass wide ranges of materials and are therefore written in free form, giving users the latitude needed while insisting that at least certain information be included in some way.

Standards directed at authors tend to go into greater detail and to be more prescriptive in their recommendations. ANSI Z39.18-1974, "Guidelines for Format and Production of Scientific and Technical Reports," includes as section 2.3.1: "Include one report documentation page as the first right-hand page following the front cover in each volume."²⁸

A rather odd standard, which is nevertheless worth reading, is ANSI Z39.16-1979, "Standard for the Preparation of Scientific Papers for

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Written or Oral Presentation." Its purpose is "to help scientists in all disciplines to prepare papers that will have a high probability of being accepted for publication and of being noticed, read, and completely understood when they are published."²⁹ With the exception of sections 5.7.1—5.7.5 on guidelines for illustrations, most of this standard is concerned with content, not presentation, and is probably the most "free form" of any of the Z39 standards.

A related standard is ANSI Y15.1-1979, "Illustrations for Publication and Projection," which is referenced in the two preceding standards. This standard gives very specific guidelines on legibility of different types of lettering and the amount of information which can reasonably be fitted into one chart.

Standards for References

Compared with the standards for primary materials, those for references are much longer and more complex, but are fewer in number. In terms of the model presented by Rush in this issue, these standards are a combination of level three (data element values) and level four (presentation).

The largest standard in this group produced by ANSI is Z39.29-1977, "Bibliographic References." This standard as published is ninety-two pages in length, although nearly sixty pages of this are appendixes which "are not a part of *American National Standard for Bibliographic References, Z39.29-1977*, but are included for information purposes only."³⁰ The sections dealing primarily with presentation of references are:

- 4.5 Sequence of Bibliographic Elements within Standard References. Introduces the concepts of a Standard Reference, Bibliographic Group, and Bibliographic Level;
- 4.6 Punctuation and Format. Punctuation includes . , ; () [] : = and space; and
- 4.7 Representation of Data. Including Capitalization, Typography, Authors, Abbreviations, Pagination, Titles, and In-Text Reference.

The library world is, of course, deeply involved in providing people with references in an easily readable form. The most familiar of these is the card catalog, rapidly being supplanted by computerized systems. Somewhat surprisingly, although cataloging standards have long existed, a standard for the layout of catalog cards does not exist other than the *de facto* standard provided by cards printed by the Library of any move to develop standard card layouts, but has prompted standardi-

zation at a lower level through a series of standards termed International Standard Bibliographic Descriptions (ISBDs). The ISBDs are produced by the International Federation of Library Associations and Institutions (IFLA), and there is now a whole series of them:

ISBD(A): ISBD for Older Monographic Publications (Antiquarian), 1980;

ISBD(CM): ISBD for Cartographic Materials, 1977;

ISBD(G): General ISBD: Annotated Text, 1977;

ISBD(M): ISBD for Monographic Publications. First standard edition revised 1978;

ISBD(NBM): ISBD for Non-Book Materials, 1977;

ISBD(PM): ISBD for Printed Music, 1980; and

ISBD(S): ISBD for Serials.

Each of these standards has an introduction giving the history of the standard.

The ISBDs introduce a somewhat complicated, very systematic and much-criticized³² system of punctuation to achieve their aims as set out in the preliminary notes of ISBD(G):

The primary purpose of the...ISBDs is to aid international communication of bibliographic information by (i) making records from different sources interchangeable, so that records produced in one country can be accepted easily in library catalogues or other bibliographic lists in any other country; (ii) assisting in the interpretation of records across language barriers, so that records produced for users of one language can be interpreted by users of other languages; and (iii) assisting in the conversion of bibliographic records to machine readable form.³³

The representation format developed by the ISBD standards has been incorporated into the latest *Anglo-American Cataloging Rules*³⁴ as much as possible. Several people, notably Michael Gorman, have been deeply involved in both these standardization projects. The Library of Congress has produced a standard for the *Bibliographic Description of Rare Books*,³⁵ which incorporates AACR2 and ISBD(S).

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