Suggested Guidelines for Screen Layouts and Design of Online Catalogs

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CENTRAL TO THE CONCEPT of an online catalog is the display of bibliographic and other information on a CRT screen. Yet each designer of the online catalog has developed a fairly unique approach to the issues of layout, content, and sequence of data, typography, spacing, punctuation, and vocabulary.[1] Good computer systems must accommodate the ways that people read and understand CRT terminal displays.[2]

As online catalogs proliferate and users move from system to system it becomes crucial that the user of the online catalog be presented with screens that are relatively similar in layout and content. This has important implications both for the system designer and for the user of the online catalog. For the system designer, familiar and relatively similar screen displays mean that the user will spend less time reading the screen. Thus the time between the entry of command/choices will be shorter. This means that the online catalog, an expensive resource, has the potential for more user transactions per hour. For the user, familiar screens mean less time will be needed to (re)learn the use of an online catalog in a variety of library settings.

The following preliminary guidelines for screen layout and design are presented in an effort to spark discussion and become a focus for consensus building. A "guideline" is a range of acceptable options that gets the library profession closer to an online catalog that works under a variety of circumstances. Guidelines are not meant to be set in concrete but are meant to evolve as the available data and research gets better. The

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guidelines will and should change as we learn more. Good screen guidelines must emphasize:

—*consistent* display formats so the user knows where to look for information;
—*consistent* labeling of information;
—the value of *brevity*—displaying no more data than needed by the user; and
—*efficient information assimilation* by the user.

Consistency—the foundation of systems that are easy to learn, use, and remember—allows the user to form a simple conceptual model of the online catalog. When the designer's conceptual model of the online catalog closely parallels the model developed by the user through use of the system, the system can then be called user friendly.

Brevity—acknowledges that the human user is limited in the amount of information that can be absorbed in a given period of time. Ignoring this limitation will result in increased frustration and user errors. Overall density, often expressed as a percentage of the total character spaces available, measures the number of characters displayed. Local density, usually manipulated by altering line spacing, is an indicator of the number of filled spaces near each character. Low density numbers should mean good user comprehension.

Compatibility—another desirable characteristic—minimizes the amount of information recoding that must be done by the user. Good compatibility ensures efficient information assimilation by the user. Related data should be grouped or "chunked" together.[3] The layout complexity of a display should follow a predictable visual scheme.[4]

Some general guidelines are presented followed by some specific guidelines that relate to different types of online catalog displays. References are given to indicate the degree of support that prior research, experience, and the synthesis of other work related to displays give to these guidelines. Both in substance and style the following guidelines draw heavily from Smith and Aucella.[5]

Label Guidelines

1. *Labels Should Be Uppercase.* Display labels in uppercase only.[6]
2. *Labels Should Be Words, Not Abbreviations.*
3. *Every Variable Should Be Labeled.* Every variable or data element should have a distinct and meaningful name. Use of jargon should be avoided, including librarianese.[7] The choice of labels should be driven by what the majority of users call various data elements, not

what librarians think has value. For example, do users know what is meant by "IMPRINT"?

4. *Labels Should Be Right Justified.* Labels should be right justified and placed to the left of the data field.[8]
5. *Separate Labels.* Labels should be separated from data fields by a colon (:) and at least one blank space.[9]
6. *Label Length.* The amount of space provided for labels should be at least twelve characters and no more than twenty characters.
7. *Labels for Information Displayed in Columns.* Columns should be clearly identified. There are several options for displaying column labels (see fig. 1):

    a. UPPERCASE only
    b. Underlined UPPERCASE
    c. Uppercase with hyphens—e.g., ---- UPPERCASE ----
    d. Uppercase in REVERSE VIDEO

At this time there are no clear research results to indicate which type of label to use for information displayed in columns. In the face of a lack of research, all caps with underscore is recommended. Color displays may also help to solve this problem.

General Text Guidelines

1. *Arrange Data Logically.* Arrange information in logical groups functionally.[10]
2. *Mix Upper and Lowercase Text.* To improve legibility and help differentiate text from labels, general text should be displayed in mixed upper and lowercase with conventional use of capitalization—i.e., to start sentences, to indicate proper nouns and acronyms, etc.[11] Should indexes which are not stored in uppercase only be displayed in uppercase only? Research suggests not.
3. *End Sentences with a Period.* Every sentence should end with a period.[12]
4. *Little or No Hyphenation of Text.* Words should not be broken by hyphenation. Lines should be broken at words rather than splitting a word in two. Unjustified text lines are just as legible as right margin justified text.[13] Ragged right-hand margins are also probably easier to do than right-justified margins.
5. *Left Justified Text.* Text should be left justified.[14] The label should be right justified, followed by a colon, then a space, and then the text. There should be two parallel lines if you look straight down the middle of the display. With labels right justified and text left justi-

1. ALL CAPS, for example:

LINE #	AUTHOR	TITLE	YEAR
1	Stone, Allan A.	The abnormal personality	1976
2	Stone, Albert E.	The innocent eye: childh	1975
3	Stone, Albert E.	Twentieth century interc	1977
4	Gawain and the Green Knigh	Sir Gawain and the Green	1968

2. ALL CAPS WITH UNDERSCORE, for example:

LINE #	AUTHOR	TITLE	YEAR
1	Stone, Allan A.	The abnormal personality	1976
2	Stone, Albert E.	The innocent eye: childh	1975
3	Stone, Albert E.	Twentieth century interc	1977
4	Gawain and the Green Knigh	Sir Gawain and the Green	1968

3. ----- ALL CAPS ------ (WITH HYPHENS), for example:

LINE #------	AUTHOR ----------	-------- TITLE ---------	YEAR
1	Stone, Allan A.	The abnormal personality	1976
2	Stone, Albert E.	The innocent eye: childh	1975
3	Stone, Albert E.	Twentieth century interc	1977
4	Gawain and the Green Knigh	Sir Gawain and the Green	1968

4. ALL CAPS (WITH REVERSE VIDEO), for example:

LINE #	AUTHOR	TITLE	YEAR
1	Stone, Allan A.	The abnormal personality	1976
2	Stone, Albert E.	The innocent eye: childh	1975
3	Stone, Albert E.	Twentieth century interc	1977
4	Gawain and the Green Knigh	Sir Gawain and the Green	1968

Figure 1. Options for Tabular Labels

fied, you have jagged edges on the outer margins and in the middle you have symmetry. Subject headings should be viewed as text—i.e., presented as upper and lowercase.

6. *Text Width of 55 Characters.* Text should include no more than 55-60 characters per line.[15]
7. *Highlighting.* The variable textual information should be highlighted with the labels displayed in normal or dim intensity.[16]
8. *Paragraphs.* Paragraphs should be no longer than four lines each. Paragraphs should be separated by a single blank line.[17]

Instructional Text Guidelines

Text for instructions, directions, help screens, and options should follow these guidelines:

1. *Simple Sentence Structure.* Short, simple sentences should be used.[18]
2. *Affirmative Sentences.* Affirmative rather than negative statements should be used. Tell the user what to do not what to avoid.[19]
3. *Active Voice.* Sentences should be in the active voice because active voice sentences are easier to understand.[20]
4. *Temporal Sequence.* The word order of sentences describing a sequence of actions should correspond to the sequence of activities.[21]

   Examples: (Good) Press RETURN to start a search.
   (Bad) To start a search, press RETURN.

   Don't ask the user to transpose the instruction.
5. *Use Complete Words.* Complete words—not contractions or short forms of a word—should be used.[22]
6. *Avoid Jargon.* Words used should be familiar to the user and avoid the jargon of librarians and computer programmers.[23] For example, in displays of authority information, the records related to a controlled vocabulary heading have been referred to as "references," "titles," "records," "items," "citations," and "papers." Are any of these terms more or less intelligible to users? More work is needed in this area.
7. *Consistent Wording.* Word usage should be consistent, especially for terminology pertaining to the online catalog.[24] *Example:* If the word "screen" is to be used, then synonyms such as frame, display, etc. should be avoided. We may need to develop a glossary so that we can call things by the same names regardless of the system we are in. We need to get away from the "not invented here" syndrome—i.e., the belief that vocabulary that originated somewhere else can never be appropriate for my special needs. The glossary contained in Hildreth's book is a good starting point.
8. *Information Content.* Only information *essential* to the user's needs should be displayed. Simplify all screens. However, all data pertinent to a particular information need—e.g., location and status information—should be displayed on the same screen.[25]
9. *Information Density.* The total amount of information to be displayed at any one time should be carefully controlled. No more than 30 percent of available character spaces should be used—15 percent is recommended.[26] Users always perceive that the screen is more filled

with information than it actually is.[27] Crawford et al., in a forthcoming book, are measuring the information density of various online catalog screen designs.

Screen Layout Guidelines

1. *Identify Screens.* For screen or page-based systems, every screen should display the user's input that led to the current screen. If this information is not incorporated as a part of the system's response to the user, it should be displayed in the upper right-hand corner of the screen.
2. *Organization of Data.* The organization and location of displayed data elements should be standardized. This permits the user to develop spatial expectations. Data should be presented using spacing, grouping, and columns to produce an orderly and legible display.[28]
3. *Screen Segments.* The screen should be divided into three segments (top, middle, and bottom) with each segment reserved for specific functions. For example, the top of the screen usually shows how the user got the present screen, the middle of the screen presents the current information, and the bottom of the screen is typically reserved for the display of options available to the user.[29]
4. *Dashed Lines.* Dashed lines may be used to segment the screen.[30]

The following sections give specific guidelines for the layout of a number of different types of screen displays. Guidelines that apply to more than one type of display are repeated.

Screen Layout—Authority Display

There is little guidance to date for this area. For example, should the records associated with a heading precede or follow that heading? Should the main heading (material preceding the first --) be repeated or should it be displayed once with the subheadings indented on the following lines? There are some things we do know however:

1. *Line Numbers.* Lists of items continued on the next page (scrolled) should be numbered relative to the first item on the initial page.[31] Leading zeros in line numbers should not be used.[32] Line numbers should start with the number "1" not "0." On some systems, you look at ten items (numbered one through ten) then go to the next page for ten more and they are numbered one through ten again; you go to the third page and they are numbered one through ten. How can the user

keep track? That is the issue. Constantly increasing numbers are recommended.

2. *Order of Items.* Items in a list should be arranged in some recognizable and useful order such as chronological, alphabetical, or degree of importance.[33] Last-in-first-out is generally not a useful display sequence.
3. *Data Elements Included.* Data elements to be included in a multiple line (record) display are:

   —Line number
   —Authority heading
   —Number of related records

   What sequence these elements should appear in has not been addressed though it is assumed that the line number should come first.
4. *Tabular Displays.* When multiple data elements appear on a single line—e.g., line number, authority heading(s), number of related records—the data elements should be broken into separate blocks—tabular display—and not run together and separated with slashes.[34]
5. *Label Column Displays.* To reduce misunderstandings and increase efficient information assimilation by the user, all columns should have a column heading label.[35] A sample authority display that incorporates these design guidelines is shown in figure 2.

Screen Layout—Multiple Line Display

1. *Line Numbers.* Lists of items continued on the next page (scrolled) should be numbered relative to the first item on the initial page.[36]
2. *Order of Items.* Items in a list should be arranged in some recognizable and useful order, such as chronological, alphabetical, or degree of importance.[37]
3. *Data Elements Included.* Data elements to be included in a multiple line (record) display are:

   —Line number
   —First (N) characters of the author
   —First (N) characters of the title
   —Year published

   Note: in a sample of eighteen online catalogs, seventeen include the title (truncated), fifteen the author (truncated), thirteen the line number, seven the call number, nine the year, four the location, two the publisher, and one the record ID. Perhaps the data elements to be included vary by type of search. For example, for an author search, assuming the author's name being searched is displayed once, the

```
BROWSING SUBJECT HEADINGS: Library

LINE #  TITLES   SUBJECT HEADINGS
  1       14     Library Administration
  2       23     Library Architecture
  3        6     Library Associations
  4       21       - Congresses
  5        5       - Directories
  6        8     Library Buildings
  7       10     Library Catalogs
  8        3       - Card Catalogs
  9        4       - COM Catalogs
 10        8       - Online Catalogs
 11        2     Library Education
 12        3       - Canada History
 13        4       - US History
 14       36     Libraries, University and college
 15        3       - Acquisitions
 16        6       - Addresses, essays and lectures
 17        9       - Administration
 18        2       - Automation
 19        2       - Case studies
 20        1       - Collected works

More records may be seen on the next screen.

CHOICE: __

Select the NUMBER of the item you want to see, or
N  NEXT SCREEN                H  HELP
P  PREVIOUS SCREEN
```

Figure 2. Sample Authority Display

data elements to be displayed in tabular form include line number, title, and year published (perhaps call number). For a title or author/title search, the data elements to be displayed in tabular form include: line number, author, title, and year published.

4. *Tabular Displays.* When multiple data elements appear on a single line—e.g., line number, author (truncated), title (truncated), year, etc.—the data elements should be broken into separate blocks—tabular display—and not run together and separated with slashes.[38]
5. *Label Column Displays.* To reduce misunderstandings and increase efficient information assimilation by the user, all columns should have a column heading label.[39]

Figure 3 provides an illustration of a sample multiple line display that incorporates these guidelines.

```
SUBJECT SEARCH: Economic RETRIEVED 31 RECORDS

LINE #  AUTHOR            TITLE (Partial)                    YEAR

 1      Blaug, Mark       Economic Theory in retrospect      1968
 2      Clark, Colin      The economic development of Weste  1959
 3      Clough, Shepard   The economic development of Weste  1959
 4      Commoner, Barry   The poverty of power: energy and   1976
 5      Dobb, Maurice     Studies in the development of cap  1947
 6      Faulkner, Harold  American economic history         1960
 7      Galbraith, John   The age of uncertainty            1977
 8      Galbraith, John   Money whence it came, where it we 1975
 9      Gould, John Devi  Economic growth in history; surve 1972
10      Heibrouer, Ronald The making of economic society/R   1980
11      Hicks, John Richa A theory of economic history       1969
12      Kenwood, A.G.     The growth of the international e  1971
13      Levy, Lester S    American economic development gro  1962
14      McClelland, David The achieving society              1961
15      Polanyi, Karl     The livelihood of man, edited by   1977

More records may be seen on the next screen.
CHOICE: __

Select the NUMBER of the item you want to see, or
N  NEXT SCREEN                H  HELP
P  PREVIOUS SCREEN
```

Figure 3. Sample Multiple Line Display

Screen Layout—Single Brief Record Display

This display provides a brief record and one or more records may be displayed on a single screen. If a search retrieves a single record, the system should automatically display the record in a (default) single brief record display. Most systems require the user to enter another character and hit RETURN even if there is only one choice to be displayed.

1. *Layout.* The layout or format of a brief record should not be the traditional 3 x 5 card catalog format but rather a structured, labeled format.[40] Note: in a sample of fourteen online catalogs, seven use a structured labeled format.
2. *Label Every Variable.* Every variable or data element should have a distinct and meaningful name. Use of jargon in the labels, including librarianese, should be avoided.[41]
3. *Information Content.* Only information *essential* to the user's needs should be displayed.[42] A number of observers have suggested that users of the catalog actually use little of the data presented.[43]

Screen Layout—Copy and Status Display

To the extent possible, the use of a tabular layout is recommended. Labels should be capitalized and text should use upper and lowercase characters. A sample brief record display is shown in figure 4.

```
DISPLAY RECORD NUMBER 7 FROM A SET OF 31 RECORDS.

        AUTHOR:  J. F. Foster and F. Mowat
         TITLE:  Final Report on Interlaboratory Cooperative Study
                 of the Precision and Accuracy of the Measurement of
                 Nitrogen Dioxide Content in the Atmosphere Using
                 ASIM Method D2914.
     PUBLISHER:  New York: American Society for Testing and
                 Materials, 1978.
          CALL
       NUMBER:   TD844
                 A45
                 N055

BARCODE #  LOCATION   STATUS
123456789  Main       On shelf
198765432  Branch     Checked out


CHOICE: __

N  NEXT SCREEN                H  HELP
P  PREVIOUS SCREEN
```

Figure 4. Sample Brief Record Display

Screen Layout—Medium or Full Record Display

This display provides most or all of the full MARC record. (The display may therefore require more than one screen.)

1. *Layout.* The layout or format of a record should not be the traditional 3 x 5 card catalog format but rather a structured labeled format.[44] And related data—e.g., author and added author entries—should be combined in the display of the online catalog. Note: In a sample of fourteen displays, seven use a structured labeled format.
2. *Label Every Variable.* Every variable or data element should have a distinct and meaningful name. Use of jargon in the labels, including librarianese, should be avoided.[45]

Figure 5 illustrates a sample full record display using the earlier suggested guidelines.

```
DISPLAY RECORD NUMBER 7 IN FULL FROM A SET OF 31 RECORDS.

        AUTHOR:  J. F. Foster and F. Mowat
         TITLE:  Final Report on Interlaboratory Cooperative Study
                 of the Precision and Accuracy of the Measurement
                 of Nitrogen Dioxide Content in the Atmosphere
                 Using ASIM Method D2914.
     PUBLISHER:  New York: American Society for Testing and
                 Materials, 1978.

   DESCRIPTION:  265 pages, includes index and bibliography
       SUMMARY:  This study critically examined the measurement of
                 nitrogen dioxide content in the atmosphere using
                 representatives from both government agencies and
                 private corporations.

      SUBJECTS:  1  Nitrogen dioxide
                 2  Nitrogen dioxide, testing
                 3  Atmosphere testing

   CALL NUMBER:  TD844
                 A45
                 N055

CHOICE: _

N  NEXT SCREEN                H  HELP
P  PREVIOUS SCREEN
```

Figure 5. Sample Full Record Display

Conclusions

It is possible to develop valid guidelines for the display of bibliographic and related information on the screen of a CRT terminal, and now is the time to do so—before the number of online catalogs grows too large. Some similarity exists now.

The display guidelines should employ principles based on available research. These guidelines should be used consistently whenever a system designer chooses to employ a particular feature or display.

Standard nomenclature is required now to identify and describe the various elements and screens of the online catalog. A standard for the names of different data elements is also needed now. Again, the names should be what a majority of users call a particular data element, not what librarians and system designers think a label should be called.

Research is needed to help determine which of the various data elements—and in which sequence—are needed by users. For example, should a brief display provide author, title, series, publisher, subjects, contents notes or title, series, author, publisher, year, subjects or...? We need to format the display from the *user's* perspective.

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