An Overlap study of architecture resources on the Internet

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Jeanne M. Brown

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Every librarian knows the importance of a core collection of print materials. Those are "the important materials that form the center of the collection that most libraries would wish to hold."(FN1) Now certain Web sites and certain categories of sites are starting to emerge as core Internet resources. This paper studies whether there is consensus among architecture librarians and bibliographers about the Web sites of value for students and faculty in accredited architecture degree programs.

QUALITY, THE INTERNET AND THE NAAB

An often-repeated warning about the Internet is the uneven quality of its Web sites. Librarians strive to address this issue by pointing to preferred, librarian-selected links on their Web pages. Just as with print collections, a standard criterion for the selection of Web links for library pages is quality.

Relevance to the educational mission of the institution is another criterion for the selection of links. It is reasonable to assume that links being made from an architecture school library's home page are what the library considers important for their patrons' educational needs.

For the study of architecture, the National Architectural Accrediting Board (NAAB) sets common standards based on thirty-seven performance achievement criteria. Although some of the criteria are skills-oriented, others relate to curriculum areas like structural systems or architectural history. The standards set by the NAAB establish a coherence in mission among the member institutions and would seemingly establish an analogous coherence in the resources used to support that mission.

A core collection of Internet resources among NAAB schools is then the anticipated result of this overlap study. Yet studies to identify core print titles in undergraduate collections have found less overlap than expected, possibly because of differing budgets and the "idiosyncratic nature of the undergraduate curriculum."(FN2)

Our query: Would a core collection of architecture links emerge in an environment where cost and curriculum variation are minimized?

FINDING AND COUNTING WEB SITES

Finding an architecture library's Web site can be a tortuous process. The NAAB list of accredited architecture schools was used to access the sites of each accredited architecture program. However, NAAB-identified links typically led to the Web page for the architecture school or to the Web page of the university. Many architecture school pages did not have a direct link to the architecture library. Those that did most often listed the library under "facilities." This
reflects the NAAB accreditation report format, which considers the library as a facility. Other institutions listed the library under "resources."

Once the library Web site was identified, it was examined to determine if links were provided to Web architecture resources. Eighty architecture school library sites and two main library sites at institutions with accredited architecture degrees have links to architecture resources on the Web. These sites constitute the pool of eighty-two Web pages reflecting eighty-one institutions (one of the main library sites is at the same institution as one of the architecture library sites). Three of the library pages linked primarily to art sites but since there were some architecture links they were included in the pool examined.(FN3)

A surprising number of libraries had no Web site or links. Thirty-one architecture school library sites had no links to architecture resources while four libraries had no Web site for the library. Thus of the 112 institutions granting NAAB accredited architecture degrees having accessible library pages, twenty-eight per cent did not link to any architecture Web resources.

THE NAME GAME

A tally was generated of most of the links made by the libraries in the pool. A few links were omitted from the tally. These were discussion groups and listservs as well as some very comprehensive lists of architecture schools and associations. These would not have affected the overall results except for inflating the number of unique sites.

The tally was made more difficult by the variety of names given the sites. A great effort was made to identify and collate sites that were in fact the same even though titled differently or were links to sub-parts where the more comprehensive site was also listed in the tally, but no doubt some were missed. Examples of variety in naming that caused initial confusion in the tally are ADA Information instead of Cornucopia of Disability Information; and Turkey: Classical Architecture which is equivalent to ArtServe. One case of whole/sub-part identification discrepancy is the Getty Web site versus its sub-part the Art and Architecture Thesaurus. Conversely, some sub-parts were deliberately left to stand on their own, such as the Library of Congress's Historic American Buildings Survey.

MANY CHOICES, LITTLE CONSENSUS

There was a surprising variety found in the links selected by libraries, given the hypothesis that coherence in educational mission would result in coherence in the Web resources selected. There were 942 sites in the tally. Over 600 sites were linked to by only one library. More than sixty-four per cent are unique titles, a significant amount considering that the study intentionally omitted several sources for unique sites. Only thirty-seven sites (3.9% of the sites in the tally) were linked to by at least ten libraries. Seventy-eight sites (8%) were linked to by five libraries or more. These findings are comparable to a study of the print collections of the sixty-four institutions in the Oberlin Group by Hardesty and Mak. The Hardesty/Mak study found that over 90% of the titles were held by ten or fewer libraries.(FN4)

The top three most-linked-to sites are Web directories or lists of sites: World Wide Web Virtual Library: Architecture, Cyburbia, and my own guide Architecture and Building. The first two are very comprehensive, although even they are "selective" in the sense of covering only architecture or architecture and planning. Cyburbia claims to link to more than 7700 sites (there is no separate figure for architecture). The WWW Virtual Library: Architecture links to about 2300 sites. By contrast, my guide has about 1200 sites.

The variance in number of sites illustrates two approaches to compiling Web guides: selective and comprehensive. Each approach has its advantages. A selective guide can draw attention to
the most valuable sites. The comprehensive approach, on the other hand, can portray the state of
the architecture information universe on the Web.

Web directories, the AIA site, and the e-journal Architronic were consistent favorites and were
the only sites linked to by more than half the libraries. It should come as no surprise that
Architronic, the first and most academically oriented (scholarly) architecture e-journal, was the
journal title most cited. Considering that Architronic is the only scholarly electronic architecture
journal on the Web, it might be surprising that only fifty-one per cent of libraries linked to it.
Although fifty-one per cent is indeed a high percentage given the results for other sites in this
study, it nonetheless indicates rather limited access, especially since the Avery Index to
Architectural Periodicals no longer covers the journal.

The appendix lists the top thirty-seven Web sites in rank order by the number of links and
indicates the number of libraries linking to each. Obviously some libraries link to a site more
than once (three times is not uncommon, six times is the maximum). Multiple links to the same
site are an indicator that sub-parts are considered of value, but there is the risk that one library
can inflate the rating for a given site.

Some Web sites are not constructed to facilitate linking to subparts. In these sites, sub-parts do
not have a consistent URL, so the main page is the only reliable anchor. Naturally, this affects
the number of links an individual site garners.

WHAT THEY HAVE IN COMMON

The most popular Web sites have some predictable common characteristics. They are in
English. Most have had a Web presence for a year or longer, indicating that longevity may be a
factor. Forty-nine per cent are from educational institutions. Five are the Web incarnations of
titles published in other formats: Sweet's, the Avery Index, the Historical American Building
Survey (HABS), ProFile, and Metropolis Magazine, which lends them a certain authority. The
nine Web directories and two of the three electronic journals exist because the Web itself made
them possible or desirable. The organization sites and the library sites are examples of areas
where the Web excels: specific information about an institution and its resources.

The relation of Web links to NAAB curricular criteria is hard to establish other than by
intuition: Web directories link to content areas; e-journals may well have articles on those areas;
organizations are related to professional interests; and so on. Images are the most directly related
to the NAAB content, providing support for areas of the curriculum related to architectural
history. Sweet's is relevant to the building materials section of the criteria. The tenuous
relationship with curriculum is perhaps an indicator of the extent the Web has yet to go to
become a resource that can support instruction across the NAAB criteria. It may also indicate
that there are a variety of sources in content areas, many useful but few comprehensive enough
or outstanding enough to emerge as core in an overlap study.

More than half the popular sites could be considered as "reference" sites: sites whose print
equivalents would be found in a library's reference section. It is not surprising that librarians
create links that can be used to answer patron questions. They select resources such as Web
directories, the Avery Index, reference tools from the Getty such as the Art and Architecture
Thesaurus, ProFile and other directories such as those found on the AIA and ACSA sites, image
databases/collections, Sweet's, and competitions data. Such are reflected in my article "Core
Resources on the Web" which appeared in the Spring 1999 issue of Archi-Tech.(FN5)

RANKING POPULAR SITES

The top categories are listed below. The rankings are based on the number of top sites which
fall into that category and on the total number of links those sites represent for each category. The sites within the category are listed with their rank order.

* Web directories (nine sites, 328 links)
  [WWW Virtual Library: Architecture (1), Cyburbia (2), Architecture and Building Guide (3), Yahoo (7), ArtSource (8), Landscape Architecture Virtual Library (18), Voice of the Shuttle (21), AEC Info (24), and Galaxy (24)]
* organizations (eight sites, 191 links)
  [AIA (4), ASLA (9), Getty (12), SAH (13), CCA (15), ARLIS (17), ACSA (20), and National Trust for Historic Preservation (23)]
* images (four sites, 73 links)
  [SPIRO (11), ArtServe (16), HABS (19), and Renaissance and Baroque Architecture (20)]
* e-journals (three sites, 64 links)
  [Architronic (5), Metropolis (22), and Virtruvius online (24)]
* libraries (three sites, 52 links)
  [Avery Library (14), MIT Library (15), and Library of Congress (23)].

The other ten categories represented have just one site per category:
indexes: Avery Index (6),
directories or firms: Profile on the Web (10),
product/manufacturer: Sweet's (17),
projects: Arcosanti (20),
bookstores: architectstore.com (20),
archives: International Archive of Women in Architecture (21),
competitions: Death by Architecture (23),
museums: National Building Museum (23),
architects: Alvar Aalto Museum (24), and
schools: MIT School of Architecture and Planning (24).

RANKING POPULAR CATEGORIES
Judging just by the sites most linked to, core categories are Web directories, organizations, images, e-journals, and libraries. It is also worthwhile to look at the categories which libraries themselves establish.

To generate a tally of categories used, each heading was noted and grouped. For instance, the headings "online journals and books" and "electronic journals" were noted as being examples of use of the category "electronic resources." The variety of headings used by libraries in the pool did present some challenges. To group library headings such as "professional sites," "technical resources," "construction and materials," "building technologies," "architecture practice," and "architecture licensing exam links" the category "Professional/Technical" was created. This category was not used to include firms or links to the directory ProFile, which might have been considered "Professional/Technical" but were put into separate categories. Similarly, one library's "building science" category was tallied under the category "Professional Organizations" since all the links were to organizations.

For those libraries using categories, the number of categories varied from two to fifteen. Even though any one library did not have more than fifteen categories, in the aggregate and after grouping equivalent terms, there were forty-one distinct categories used by one or more of the sites.

Not all libraries group the sites they link to into categories. Therefore, in addition to noting and grouping headings, sites that do not categorize their links were examined and added to the
tally of categories, based on the uncategorized library links. If such a site had more than one link in a category it was counted only once. The chart "Categories used Most Frequently" compares numbers using the category to numbers linking to a certain type of site for the seven most used categories.

The most common cited category identified "electronic resources"; this term or similar terms appeared in thirty-eight libraries (forty-six per cent). Eight additional libraries linked to individual electronic resources but did not use a category. The type of sites linked to in this area are primarily electronic journals, but electronic books are also included.

The second most frequent category is that of "Web directory." Although the term "directory" is commonly used to refer to one of the two main Web search approaches, search engines and lists of links or directories, only two libraries used the term "directory" as the category heading. Instead, a variety of terms were used by the pool to categorize these directories, including bibliographies/resource lists, subject listings, recommended Internet research guides, guides to online architecture resources, collections of Web links, WWW metasites, gateway sites, Web site lists, clearinghouses, comprehensive architecture sites, cyberographies, links and resources, Internet compilations, and "good starting points."

Thirty-five libraries used a category to group Web directories. Web directories then were categories on forty-three per cent of the pages. This figure rises to ninety-five per cent if all pages linking to Web directories are included whether categorized or not, making it the most popular type of link (as indicated by the core sites listing).

Other major categories are professional organizations, architecture libraries, indexes, images, and schools of architecture. Additional categories in descending order of the number of sites using them are architects, architecture firms, architecture museums, professional/technical, architectural history, governmental information, product information, urban design, buildings, electronic discussion groups, databases, landscape architecture, book dealers/publishers, competitions, historic preservation, jobs, environment, and directories. Other categories had fewer than seven sites using them.

LIBRARY LINKS VS. SEARCH ENGINES

Given the improved efficiency and presumed continued improvement of search engines, the identification of core sites as well as the creation of individual library pages highlighting selected Web sites might seem to be a waste of the librarian's time. Even granting that patrons have a certain facility with search engines, there is, however, a great deal of Internet information that is not susceptible to being found via search engine. To give just one example, the topic 'architectural research' is not readily found with a general search engine approach. There are results, yielding anything with the words "architectural" and "research" in it, but no HVAC research, daylighting research, solar research, design research and other important sub-categories.

There are several advantages to the directory approach to locating Internet information. Most Net directories--whether formal directories or lists of library preferred sites--are selective, so that one is not searching the Web in its entirety, but only a subsection. Directories are not reliant on key word and achieve their maximum effectiveness through browsing by topic. There are some disadvantages of a directory. The user must guess the category to which a particular site may have been assigned (not as easy as it sounds!) and the selection of sites may be somewhat idiosyncratic.

A potential advantage of highlighting core sites may be that the process facilitates their eventual inclusion not just on library Web pages but in library online catalogs, integrated with
cataloging for materials in other formats as in the experimental OCLC CORC (Cooperative Online Resources Catalog) project. (FN6)

**LITTLE OVERLAP, STILL MORE QUESTIONS**

The extent of agreement as to what is "core" is widespread for only a relatively small number of sites. In this study of the overlap of Web links among libraries at eighty-one institutions with accredited schools of architecture, over ninety-six per cent of the sites were linked to by fewer than ten libraries.

There are several possible explanations for the low level of overlap. Perhaps the programs are more idiosyncratic than the necessity of adhering to NAAB criteria would suggest. Perhaps some libraries are still finding their way through the Web's thousands of architecture sites or lack the time to delve into Web resources. Perhaps Web resources are still underdeveloped as a whole with relatively few that have gained widespread recognition.

Further study will be necessary to explore these possibilities and to establish whether core collections of Internet resources follow patterns similar to those of print collections.

**ADDED MATERIAL**

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**Table 1. Categories Used Most Frequently and Types of Sites Linked to Most Frequently**

<table>
<thead>
<tr>
<th>Category</th>
<th>Number using % of pool linking to this type</th>
<th>Number linking to this type of site without categorizing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web directory</td>
<td>35</td>
<td>43</td>
<td>78</td>
</tr>
<tr>
<td>95%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional organizations</td>
<td>31</td>
<td>22</td>
<td>53</td>
</tr>
<tr>
<td>65%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electronic resources</td>
<td>38</td>
<td>8</td>
<td>46</td>
</tr>
<tr>
<td>56%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Images</td>
<td>18</td>
<td>21</td>
<td>39</td>
</tr>
<tr>
<td>48%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indexes</td>
<td>22</td>
<td>16</td>
<td>38</td>
</tr>
<tr>
<td>46%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Architecture Libraries</td>
<td>23</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>46%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schools of architecture</td>
<td>16</td>
<td>9</td>
<td>25</td>
</tr>
<tr>
<td>30%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FOOTNOTES**

**APPENDIX**

Rank Ordered Architecture Internet Sites As Determined by a Survey of Architecture School Library Web Links

1. World-Wide Web Virtual Library: Architecture
   Number of links: 74
   Number of libraries linking: 57
2. Cyburbia - Internet Resources in the Built Environment
http://www.ap.buffalo.edu/pairc/
Number of links: 72
Number of libraries linking: 57
3. Architecture and Building: Net Resources
http://library.nevada.edu/arch/rsrce/webrsrce/contents.html
Number of links: 60
Number of libraries linking: 54
4. AIA
http://www.aiaonline.com
Number of links: 54
Number of libraries linking: 47
5. Architronic
http://www.saed.kent.edu/Architronic/
Number of links: 42
Number of libraries linking: 42
6. Avery Index -- many are restricted to that library's patrons; the public site, now static, is
http://www.ahip.getty.edu/aka/aka_form_pub.html
Number of links: 40
Number of libraries linking: 40
7. Yahoo: Architecture
http://dir.yahoo.com/Arts/Design_Arts/Architecture/
Number of links: 36
Number of libraries linking: 24
8. ArtSource
http://www.uky.edu/Artsource/
Number of links: 33
Number of libraries linking: 33
9. American Society of Landscape Architects
http://www.asla.org/asla
Number of links: 28
Number of libraries linking: 20
10. ProFile on the Web
http://www.cmdg.com/profile/search.html
Number of links: 27
Number of libraries linking: 27
11. SPIRO, Architecture Image Library, University of California, Berkeley
http://www.mip.berkeley.edu/query_forms/browse_spiro_form.html
Number of links: 26
Number of libraries linking: 26
12. Getty Information Institute
http://www.gii.getty.edu
Number of links: 25
Number of libraries linking: 20
13. Society of Architectural Historians
http://www.upenn.edu/sah/index.html
Number of links: 24
Number of libraries linking: 23
14. Columbia University Avery Architectural and Fine Arts Library  
http://www.columbia.edu/cu/libraries/indiv/avery/  
Number of links: 2
Number of libraries linking: 22
15. MIT Rotch Library of Architecture & Planning  
http://libraries.mit.edu/rotch  
Number of links: 19
Number of libraries linking: 16
15. Canadian Center for Architecture  
http://cca.qc.ca  
Number of links: 19
Number of libraries linking: 17
16. ArtServe: Australian National University -- Institute of the Arts  
http://rubens.anu.edu.au  
Number of links: 18
Number of libraries linking: 18
17. Art Libraries Society of North America (ARLIS/NA)  
http://www.arlisna.org  
Number of links: 17
Number of libraries linking: 11
17. Sweet's Group  
http://www.sweets.com/  
Number of links: 17
Number of libraries linking: 17
18. Landscape Architecture Virtual Library  
http://www.clr.toronto.edu:1080/VIRTUALLIB/larch.html  
Number of links: 16
Number of libraries linking: 15
Historic American Engineering Record  
http://memory.loc.gov/ammem/hhhtml/hhhome.html  
Number of links: 15
Number of libraries linking: 15
20. Association of Collegiate Schools of Architecture  
http://www.acsa-arch.org  
Number of links: 14
Number of libraries linking: 14
20. Arcosanti  
http://www.arcosanti.org  
Number of links: 14
Number of libraries linking: 14
20. Renaissance and Baroque Architecture  
Number of links: 14
20. architectstore.com  
http://architectstore.com  
Number of links: 14  
Number of libraries linking: 12  
http://humanitas.ucsb.edu/shuttle/archit.html  
Number of links: 13  
Number of libraries linking: 12  
21. International Archive of Women in Architecture  
http://scholar2.lib.vt.edu/spec/iawaspect/iawaguid.htm  
Number of links: 13  
Number of libraries linking: 13  
22. Metropolis Magazine  
http://www.metropolismag.com  
Number of links: 12  
Number of libraries linking: 12  
23. Death by Architecture: Competitions  
http://www.deathbyarch.com  
Number of links: 11  
Number of libraries linking: 11  
23. National Building Museum  
http://www.nbm.org  
Number of links: 11  
Number of libraries linking: 11  
23. National Trust for Historic Preservation  
http://www.nthp.org/  
Number of links: 11  
Number of libraries linking: 11  
23. Library of Congress  
http://lcweb.loc.gov  
Number of links (not counting HABS, listed separately) 11  
Number of libraries linking: 8  
24. Vitruvius Online [Site now defunct]  
http://www.inforamp.net/~vitruv/index.html  
Number of links: 10  
Number of libraries linking: 10  
24. AEC InfoCenter  
http://www.aecinfo.com  
Number of links: 10  
Number of libraries linking: 9  
24. Galaxy: Architecture  
http://www.galaxy.com/galaxy/Humanities/Arts/Architecture.html  
Number of links: 10  
Number of libraries linking: 9  
24. MIT School of Architecture and Planning
http://alberti.mit.edu/
Number of links: 10
Number of libraries linking: 10

24. Alvar Aalto Museum
http://www.jkl.fi/aalto
Number of links: 10
Number of libraries linking: 10