

## Making Sense of Design Research: The Search for a Database

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**If you are a design researcher or graduate student who enters the keyword “branding” into the typical university library catalogue search engine, you will be as likely to yield books on cattle as on corporate identity. Or if you are a practitioner and want to locate one of the doctoral dissertations on design, completed in a handful of research-oriented PhD programs around the world, you will need a pretty good idea of the title or researcher’s name to find it. And if you are design faculty and find it necessary to access work in non-design disciplines that might be relevant to your scholarship, you will be on your own to winnow the titles from hundreds of books within a Library of Congress topical category to find something truly useful to design. In other words, there are no current databases on design research and few design-sensitive keywords that drive other disciplinary search engines. This work proposes a solution to that dilemma.**

**Keywords:** AIGA, database, design research, literature search

### SO WHY DOES THIS MATTER?

Among the things that define professions, as opposed to trades, are segments of practice devoted exclusively to research. The doctors searching for a cure to cancer aren’t also treating broken arms and flu cases. The economists guiding decisions that influence national interest rates aren’t also selling certificates of deposit at the local bank. And the scientists developing new technologies aren’t also manufacturing parts and debugging programs. Professions invest responsibility for the generation and dissemination of new knowledge in people who are prepared specifically for that task. Further, professions depend on the work of such individuals to support current practice and to anticipate new areas of application in response to modulations in the culture and technology.

A September 2005 study by *Metropolis Magazine* (Manfra, 2005) asked 1051 design practitioners, faculty, and students in architecture, landscape architecture, interior design, industrial design, and graphic design what they think about *research*. It is not clear how these individuals define research; perceptions range from selecting fabric samples and color swatches to acquiring deep understanding of audience or user experiences. But regardless of what they think constitutes research, nearly 81% of practitioners say their offices engage in it regularly and 65% of university department chairs say it is integral and required of faculty in their programs, with less than 1/3 of these academic respondents working in institutions with doctoral offerings. Coupled with the growth of graduate design programs internationally, there is a clear recognition that the design fields need to support decisions with empirical evidence and to extend the knowledge base of the disciplines, including in the areas of history and theory.

What is most troubling in the *Metropolis* study, however, are responses regarding dissemination of research findings. Of faculty and students responding to the survey, 90% say it is difficult to access research findings in general, and 80% struggle in getting to findings that originated within their own institutions (Manfra, 2005). Because research by design offices and businesses is generally considered to be proprietary, it is not surprising that 22% of design practitioners say they don’t share their research results with anyone outside the firm (Manfra, 2005). Another 46% of research by designers and design faculty appears to be disseminated only through conferences and presentations (Manfra, 2005), further limiting access for people who don’t regularly attend such events and for individuals in fields other than design who are not likely to mingle with designers.

Together, these two statistics tell us that more than half of the knowledge production of a small but emerging research culture is unavailable to students and to the field in general. Of the remaining efforts to share findings, only 17% of design faculty publish in books and only 23% of designers and design faculty disseminate online (Manfra, 2005). Given the rising cost of scholarly journals and the difficulty in locating relevant articles through topical indices to periodicals, these statistics hint that only a very small percentage of published design research is likely to be available through resources such as amazon.com; addressed in book reviews by disciplinespecific experts (for example, through websites such as designobserver.com); or downloadable in electronic form. If the publication is more than five years old or outside the traditional domain of the design disciplines, as it may be in psychology, computer science, business, or anthropology, the chances of discovering its relevance to design drop exponentially.

In contrast to the proprietary practices of the design profession, the fundamental mission of research universities is to disseminate knowledge. The considerable bibliographic work done by students in research-intensive design programs, however, usually goes unused by the field. Master's theses are not catalogued or filed electronically in most institutions and with only four doctoral programs in graphic and industrial design in the United States, American design practitioners have almost no history of accessing reliable empirical research generated by academic programs. New graduate students must also "reinvent the wheel" in their thesis literature searches, gaining insight from the work of their institutional predecessors only through faculty recommendations. This lack of access to knowledge handicaps the developing research culture in design. If information cannot be shared and if theory cannot undergo the test of application in the field, each researcher begins from scratch.

It is also apparent that a nascent research culture presents its own challenges. Keyword lists are necessary for most literature searches, yet there is little consensus within design about what terms mean. And if the goal is to extend access to literature outside the field, meanings multiply.

What *usability* means to an engineer or cognitive psychologist, for example, is very different from what it means to an interaction designer.

Faced with the daunting challenge to develop a system that addresses these research dissemination shortfalls, the Master of Graphic Design students at North Carolina State University engaged in a project to design the structure and protocols for an international design research database. With support from the national office of the American Institute of Graphic Arts (AIGA), ten first- and secondyear graduate students<sup>1</sup> delivered a *proof of concept*. The project has two phases. The work done in 2006–2007 addressed the development of protocols for building the database and its architecture. Later work includes collecting professional and academic feedback from around the world and modifying the proposal on the basis of that feedback.

### WHERE TO BEGIN?

In narrowing the focus of the task, students began with discussions of the following:

1. Who will be the users of the site and what are the likely types of inquiries they will make?
2. What types of information may reside in an online database and how can the system make the best use of technological affordances in organizing it?
3. How may attributes of the site acknowledge the emerging nature of the design research culture?
4. What is the potential for a database to further the development of the research community?

While the master's students understood best their own types of literature searches, usually in confirmation of some speculative project that isolates a design principle or theory, they also recognized the need for everyday practitioners and established scholars within and outside the design fields to make sense of concepts and literature on design. In order to explore the implications of a range of users, information types, and topics, the students began with content found in a series of annotated graduate design research bibliographies, published under a grant from the National Endowment for the Arts in the late 1990s (Davis, 1997). Annotated entries in this series were already catalogued by keywords and reflected graduate-level reading. This information served as *typical data* for the students' searching, sorting, and browsing investigations.

Working in small teams, the students acknowledged that important information about design could be gleaned from the structure of the database system itself. A small study by two of them, Amber Howard and Valentina Miosuro, examined the patterns in research and writing revealed simply by sorting bibliographical entries according to certain criteria. For example, a chronological listing of books on design planning revealed periods of high and low activity in the publishing history on the topic. A cascading history of citations of particular texts indicated the seminal nature of some writing and the importance of certain authors. Other sorting strategies demonstrated: (a) the range of fields from which design-relevant information comes, (b) the sustained research output on certain topics within particular universities (indicating a programmatic focus or faculty collaboration), and (c) the clustering and nesting of keywords that form semantic networks of related topics. The advantage of a digital system is that, unlike printed bibliographies, as currently used by many schools, all such patterns can be revealed through the database program. The system is also capable of mining entries for information and placing it within the context of the larger database, a task that would be onerous for an individual researcher.

The student teams shared results of these initial studies in negotiating the general guidelines for the database design. They determined the following desired attributes of the system:

1. Content will be managed by a group of international curators (i.e. design researchers, research faculty, and institutions or organizations with demonstrated expertise in particular research content areas). Curators' biographical information will be available on the site, and there will be multiple curators for each topical area.
2. Initial content will include annotated bibliographic information including (books, journal articles, proceedings, websites): links to electronic doctoral dissertations and research-oriented master's theses at universities, PDFs of research presentations at conference sites, and expanded discussions of key concepts. Curators will also review unsolicited, published and unpublished submissions from interested researchers. Little actual content will reside on the site itself; the primary role of the site is to serve as a reference or portal to content located in other places.

3. Content entry by curators will take place through a limited-access, Wikipedia-like front end in which curators respond to prompts for certain kinds of information. Curators will have the ability to annotate the entries of other curators, making visible to the user differences in curators' perspectives on the same topic.
4. Keywords used to search will reference semantic networks of related concepts, allowing less-experienced researchers to identify a field of associated ideas for other possible searches.
5. Individual user searches will be recorded as a sequence of keywords, allowing the researcher to document a particular search event or to return to an earlier research path.

### WHY A CURATOR-DRIVEN SYSTEM?

The graduate students quickly abandoned the notion of negotiating single definitions of keywords and terminology within texts in favour of a system that, by design, engages the research community more substantively in debate and discourse about the nature of design concepts. Their idea is that the negotiation of such terms is, in itself, an important activity of any research community; that observation of that debate is informative about the points of view in the field at any given time. Therefore, the students decided to develop a system of expert curators with many points of view. Student Matthew Peterson discusses how the group arrived at the *curatorial* aspects of the system's protocols:

The research database as a whole – by its very conception – is a compromise between inclusion and exclusion. A model based on an entirely open forum (or the internet itself) is far too expansive to retain any utility, especially given the uncertain definitions of design research at this time. Relevant information for a researcher is buried in piles of distraction under such a system. If a design research database is too open-ended, if anyone can make additions to it indiscriminately, it runs the risk of sacrificing relevance and expertise for its inclusiveness.

The opposite extreme is equally problematic. A hierarchical, centrally controlled model fails by offering a singular point of view. It is inherent in hierarchies that the nexus of associations is held accountable for the system. Singular points of view are, by definition, limited, while the body of research on design is too vigorous and eclectic to be served well by one voice alone. So the challenge became to forgo hierarchy altogether and let the voices themselves determine the structure.

In a museum, the curator's charge is to maintain the collection and to frame artifacts critically within a broad range of ideas and histories, guided by his or her specialized knowledge and perspective. The job of the design research database curators, therefore, is to locate and make relevant the research they find useful, meaningful, or provocative in books, dissertations, theses, articles, and presentations. To position individual entries within the larger context of design research, it becomes necessary for curators also to provide an overview of related key concepts as a structure for organizing their collection. A curator who makes an addition to the system must frame the entry, defining the concept to which it is related, and make a case for its relevance.

One curator's definition of a relevant term is automatically connected, by the system, to the definitions of others for the same terms. Curators also can annotate others' entries. The user can search either by curator, by concept, or by the type of document. The resultant overview of the theoretical bases of design, therefore, is a product of the system's ongoing construction by individuals. It acknowledges that the database is not some impartial, self-evident, or natural totality, but instead presents viewpoints at a particular moment in time. Multiple voices speak within its space, each clearly labeled in overwritten windows that challenge, expand, or present alternative content. This doesn't suggest or support the endless conversation of blogs. Instead, its tradition is that of academic notation and clarification. The system is more than a representation of academic discourse, it is that discourse.

What became evident in the development of this curatorial annotation strategy was that the design of the system could provide a mechanism for generating and making sense of content over and above the researcher's own work. The approach places researchers in dialogue, much as research conferences and refereed journals in other fields prompt discourse that informs other work. Students wishing to build research careers see value in eavesdropping on the negotiation of concepts among mature professionals. Student Kelly Cunningham comments on the value of the system to students, over and above finding a really good bibliography:

The student researcher stands in front of the shelves of a library or scans the listings on amazon.com. The myriad of titles proclaims authority. However, it remains to be determined not only which ones are relevant to the current question, but also who the experts are with long histories in research, and who simply are the latest

"show and tell" authors. One wonders which books support theory and which extend that theory to practice, and whether or not they are one and the same. Without some guidance from the research community, a student is left wondering how to begin. A well-considered database can function as the expert portal to specific lines of inquiry and inspiration for the student.

Locating seminal works and key researchers among a sea of undifferentiated titles is only one way in which an online research community can assist the beginner. Design has long shown the relevance of research in other fields. As we build a culture of research, the database can expand its scope and reveal pathways to other disciplines that are important to design. A disciplinary annotation in a bibliography, a field-specific term, a citation of a scholar from outside design; these show paths traveled by more experienced researchers.

At the crossroads of design and parallel fields, however, lies the pressing problem of a lexicon. Terms are often appropriated and redefined from other fields, used loosely and without clarity of definition. While a peaceful resolution and agreement on all terms is not practical, the database can provide the student with a context for use of critical terms by the expert community. The goal of the database is to show the exchange among experts, including interests in transparency in the negotiation of meanings, emerging opinions, and research directions.

## THE STUDENT LEARNING EXPERIENCE

In negotiating the nature of the site, the students learned much about their own research expectations. Second-year master's students were concurrently developing thesis topics and conducting literature searches. Their understanding of the detective work necessary to frame a researchable question was quite different from that of first-year students who relied more heavily on faculty recommendations and hierarchical bibliographies. These two perspectives merged as students worked in their teams. First-year student Steven Harjula describes the collaboration:

In the beginning, the class collectively negotiated design research concepts and keywords. This abbreviated list of definitions set the boundaries for our smaller – group work on prototypes. It was daunting to form categories within such an exhaustive topic. Wisely, groups focused on an aspect of design language that was compelling to them. For example, one group explored the specific-to-general aspects of related keywords – the nesting of concepts within larger ideas.

Another group focused on visualizing the keyword paths that various kinds of researchers might take through content in a topical search.

The scope of the project, and that it will eventually be vetted by researchers and practitioners, required us to stay flexible and general in our definitions of the system and its parts. Team working strategies explored general ideas about how the system could work, not final prototypes. Some groups used index cards to represent different structures for comparing entries; others found schematic diagrams more helpful.

The students eventually collapsed their ideas into one presentation and built an animation of key frames for the AIGA *Schools of Thoughts* conference in Los Angeles in the spring of 2007. Design strategist Hugh Dubberly attended and offered to work with them on mapping the user experience of the system. In a live chat session, with Hugh in California and the students back in North Carolina (see Figure 1), Hugh talked them through a mapping strategy that allowed them to understand how legible the system was to the user and how the final prototype might be built from the user's concept of the search or browsing task.

## THE SYSTEM

Key frames of the proposed site illustrate a variety of functions. The site opens with a welcome page that also details the most recent entries to the database (see Figure 2). A scrollable list of curators and curating institutions is visible.

Curators and users view different opening pages, with the former gaining immediate access to a writable workspace; entry boxes on the writable curator space limit curators to succinct descriptions of the text and its relevance to design. Curators also tag the entry with keywords through which users will search and brief definitions of those terms.

The user enters a keyword and an information type. The user can search by concepts, curators, people, publications, or presentations. In the illustrated example, the user has asked for publications/books on the concept of "representation" (see Figure 3).



Figure 1.  
A live chat session with design strategist Hugh Dubberly.

The system generates a list from which the user selects a book by sociologist Stuart Hall (see Figure 4). The entry shows the curator's annotations, as well as a publisher's synopsis of the text. A list of related words (titled SEE ALSO) appears to the right of the text, including a more specific keyword, "narrative representation".

Also included in this list may be links to other sites and documents. Clicking on the more specific term yields a second book, in this case Kress and Van Leeuwen's *Reading Images*, which has been tagged by another curator as having related content (see Figure 5).

The space to the right of entries is a writable space in which users may take notes or copy material from the entry. This material is exportable to other software programs, such as Microsoft Word.

While the proposal states that AIGA will host and maintain the site, curators would manage its content. In many cases, universities require that doctoral and master's students produce bibliographies and literature reviews as part of their degree work. Further, most schools require one-page abstracts summarizing the content of electronic dissertation documents and research-oriented master's theses. The proposed database may benefit from this work. By standardizing the format for bibliographical submissions, it would be possible for academic institutions to simply

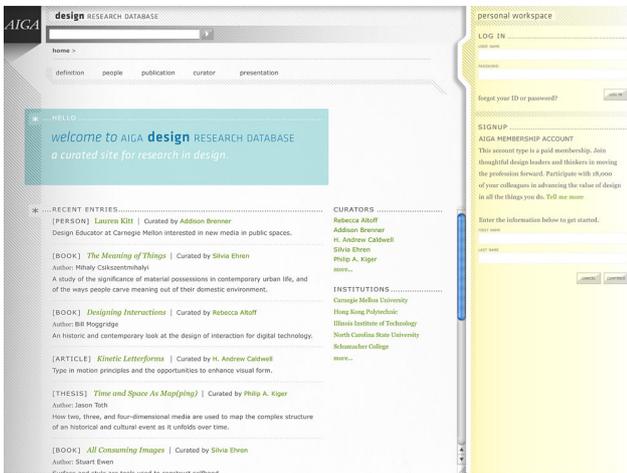


Figure 2. The site opens with a welcome page that also details the most recent entries to the database.

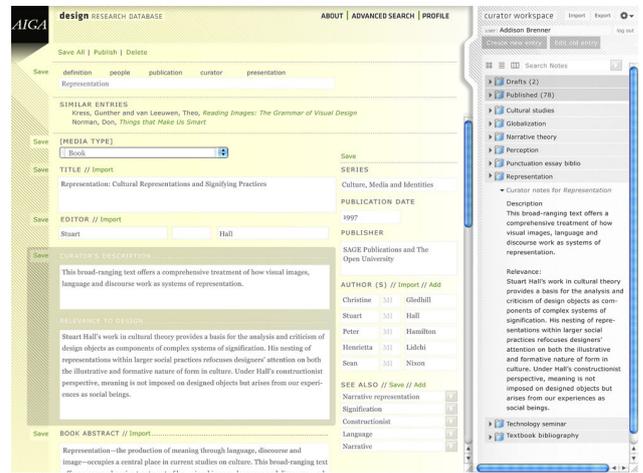


Figure 3. The user has asked for publications/books on the concept of "representation".

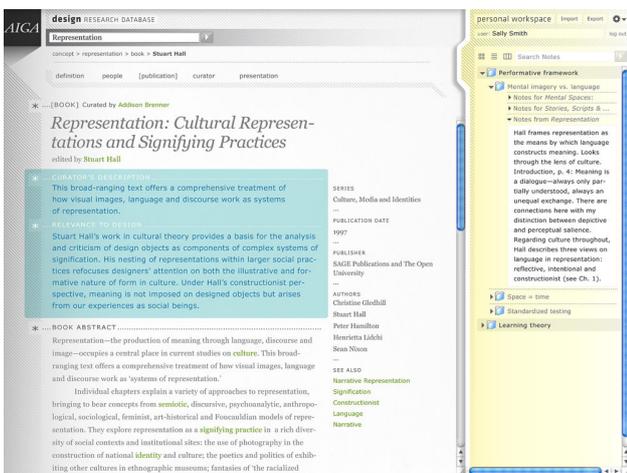


Figure 4. The system generates a list. The user selects a book by sociologist Stuart Hall.

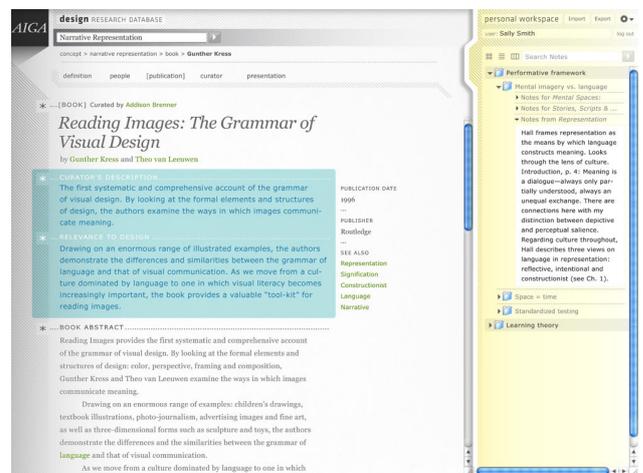


Figure 5. Clicking on a more specific term yields a second book.

screen and submit the efforts of these students as part of the curatorial task; students could submit on a curator's page, with faculty holding the sole responsibility for publishing the entry to the database.

## CONCLUSION

The proposal is currently under review by researchers and faculty worldwide. The North Carolina State University master's students gained insight into the research process and look forward to responses from the research community. Their hope is that the site will facilitate the literature searches of students who follow and that it will play some small role in shaping how we understand research in the field.

## NOTE

1. Kelly Cunningham, Jon Harris, Steven Harjula, Amber Howard, Valentina Miosuro, Matthew Munoz, Matthew Peterson, Gretchen Rinnert, Renee Seward, Michele Wong Kung Fong under the direction of professors Meredith Davis and Santiago Piedrafito.

## REFERENCES

- Davis, M. (Ed.). (1997). *Graduate research bibliographies in design*. Graphic Design Education Association.
- Manfra, L. (2005). School survey 2005: Research—Its role in North American design education. *Metropolis*, 25(1), 132–134.

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