

**A Multi-Dimensional Framework for Academic  
Support**

**A Final Report**

**Submitted to the Andrew W. Mellon Foundation  
From the University of Minnesota Libraries**

**June, 2006**



## Table of Contents:

EXECUTIVE SUMMARY .....	5
PROJECT CONTEXT .....	6
TARGET COMMUNITIES .....	8
<b><i>I. Humanities Departments</i></b> .....	<b>8</b>
<b><i>II. Area Studies Departments</i></b> .....	<b>8</b>
<b><i>III. Social Sciences Departments</i></b> .....	<b>9</b>
METHODOLOGY .....	10
<b><i>I. Project Team</i></b> .....	<b>10</b>
<b><i>II. Background Resources</i></b> .....	<b>10</b>
<b><i>III. Interviews &amp; Focus Groups</i></b> .....	<b>11</b>
A. Faculty Interviews .....	11
B. Graduate Student Focus Groups .....	11
C. Office of Information Technology Interviews.....	12
<b><i>IV. Survey Development, Content, and Management</i></b> .....	<b>12</b>
A. Survey Population.....	13
B. Web and Mail Data Collection Procedures .....	14
C. Survey Returns.....	15
D. Survey Data Coding and Management.....	15
E. Survey Data Analysis.....	17
DATA (RESULTS) .....	18
<b><i>I. General Summary of faculty interviews and graduate student roundtable discussions:</i></b> .....	<b>18</b>
<b><i>II. Faculty Interview Data</i></b> .....	<b>19</b>
A. Faculty Interviews: Overview .....	19
B. Faculty Interviews: General and Library Research .....	19
C. Faculty Interviews: Interdisciplinary and Collaborative Research .....	20
D. Faculty Interviews: Resource Organization and Storage .....	24
<b><i>III. Graduate Student Roundtable Data</i></b> .....	<b>24</b>
A. Graduate Student Roundtable Focus Groups: Overview .....	24
B. Graduate Student Roundtable Focus Groups: General and Library Research .....	25
C. Graduate Student Roundtable Focus Groups: Interdisciplinary and Collaborative Research .....	26
D. Graduate Student Roundtable Focus Groups: Resource Organization and Storage .....	27
<b><i>IV. Survey Data</i></b> .....	<b>27</b>
A. Survey Data: General Research Practices .....	28
B. Survey Data: Interdisciplinary and Collaborative Research .....	29
C. Survey Data: Library Research.....	30
D. Survey Data: Resource Organization and Storage.....	32

DATA ANALYSIS .....	34
<b><i>I. Main Emerging Themes</i></b> .....	<b>34</b>
<b><i>II. Space—Physical and Virtual</i></b> .....	<b>34</b>
<b><i>III. Digital Resources</i></b> .....	<b>35</b>
<b><i>IV. Interdisciplinary and Collaborative Research</i></b> .....	<b>36</b>
<b><i>V. Primitives—Tools of Analysis, Ways of Thinking</i></b> .....	<b>37</b>
A. <i>Discover</i> Data Analysis .....	39
B. <i>Gather</i> Data Analysis .....	40
C. <i>Create</i> Data Analysis .....	41
D. <i>Share</i> Data Analysis .....	41
PROGRAM AND PROTOTYPE DEVELOPMENT.....	43
<b><i>I. Areas of Program Development</i></b> .....	<b>43</b>
A. Library Space.....	43
B. Research Methodologies Tutorial for Graduate Students .....	43
C. Online Research Communities for Scholars: Scholar’s Collective.....	45
<b><i>II. Prototype Process</i></b> .....	<b>46</b>
A. January-February 2006: Description, Deliverables .....	46
B. March-April 2006: Refinement and Presentation .....	47
C. April-May 2006: Specification, Faculty and Graduate Feedback, External Consultation.....	48
<b><i>III. Fieldnotes from the Humanities: A Scholar’s Collective for Individual         and Collaborative Use</i></b> .....	<b>50</b>
A. Component Flexibility and Customization .....	50
B. Architectural Interoperability .....	51
C. Social Networking in the Scholarly Community .....	51
A PROPOSED SCHOLAR’S COLLECTIVE .....	52
DISSEMINATION AND FUTURE PROJECTS .....	54
<b><i>I. A Model Project</i></b> .....	<b>54</b>
<b><i>II. Dissemination</i></b> .....	<b>54</b>
CONCLUSION: CREATING A SCHOLAR’S COLLECTIVE .....	55
APPENDICES.....	57

# **A Multi-Dimensional Framework for Academic Support A Final Report**

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## **EXECUTIVE SUMMARY**

The University of Minnesota Libraries received support from the Andrew W. Mellon Foundation to develop a multi-dimensional model for assessing support for scholarship in the context of a large research campus. The project team explored discipline-specific needs for facilities, information content, services, tools, and expertise in the humanities and social sciences. The goal was to develop a model for bringing greater coherence to these distributed resources through physical and virtual means, and also a research support environment that could be modeled, prototyped, and evaluated. The study is also being used to assist the academic leadership in understanding how libraries can promote the physically boundless nature of inquiry and information use.

The framework focused on three broad components: information resources, infrastructure services, and research behaviors. We worked to develop a conceptual framework for analyzing the existing and emerging needs of disciplines (or disciplinary clusters) as they acquire, create, manage, and use knowledge resources. The analysis allowed us to identify support structures that feed these needs, whether within libraries or academic departments or elsewhere on or off campus. The study encompassed both conceptual issues of support within disciplines (related to individual and group behaviors, preferences, and trends) as well as practical needs (related to efficient use of institutional resources, differentiation of roles and expertise in the support environment, and relationships of online and physical environments).

In short, we assessed the full range of research needs and strategies of faculty and graduate students in the humanities and social sciences in order to better understand how they do their research: What materials do they use, collect, and preserve; what services and tools are useful or lacking; what kind of technological development is necessary; and where does the need for expertise lie? Further, how can the University Libraries better support research needs, within the physical context of the Library and beyond?

## PROJECT CONTEXT

Our proposal for this planning grant outlined the environmental and institutional forces that framed our assessment. The academy has experienced significant forces that have shaped institutional, discipline, and individual behaviors. Technology has fueled and also enabled new types of research, while at the same time presenting challenges of how best to integrate new tools into institutional systems and individual repertoires. Simultaneously, there have been shifts in norms and methods for scholarly communication and exchange: new types of publications and new venues for collaboration between and among scholars.

Our proposal also noted the evolution of research infrastructure on many campuses in the last several decades. Specialized facilities have emerged to provide higher-end technology support. Enterprise systems and network infrastructure have been put in place, creating our contemporary landscape for authentication and a variety of network-based services.

The University of Minnesota is a classic large, public research university with comprehensive programs and an expansive physical environment. Beginning in August 2004, the University initiated a process of strategic positioning with a goal of becoming one of the top three public research universities in the world. The ambitious agenda has been addressed through multiple task forces that have undertaken focused analysis of structural, programmatic, and cultural issues. During the 20+ months that have followed, groups have reported and institutional decisions implemented. Perhaps the most visible result has been a major realignment of collegiate units, with the elimination of two colleges and significant restructuring of four others.

In framing the strategic positioning process, the provost noted several principles that have guided investments. Early in the process, he wrote:

“...first principles suggest that we must invest much more in human capital, our faculty and students.... Second, we must increase support for internal core institutions, such as the libraries that are the centerpiece of our research, discovery, and learning. Third, as we have done with the undergraduate program, we need to enhance the graduate programs so that the University of Minnesota continues to be a leading, worldwide center of graduate education and research. Fourth, we must ensure support for interdisciplinary teaching and research across the University so that our students can see the dynamic interconnections in discovering new knowledge.”

A number of the recommendations that have resulted from this process are relevant to the critical role of the library and the changing needs of research infrastructure. The Libraries' own planning was aligned with this university

process, and the institutional priorities that have emerged have guided Libraries' program development.

Several of the strategic positioning task forces addressed issues relevant to the College of Liberal Arts (i.e., the humanities and social science disciplines). Among the themes represented in the task force dealing specifically with the College, questions of interdisciplinarity were prominent. Issues related to transitions and shifts in faculty culture and focus were also evident; notably 65% of CLA professors were hired in the last 8 years, infusing the college with a sizable cohort of new appointments. Task forces dealing with research highlighted the importance of infrastructure that facilitates collaboration. A number of recommendations described the value in enabling technologies that could promote new modes of research as well as greater effectiveness in research processes. The importance of the library, particularly the growing suite of digital resources and collections, was singled out in several reports.

In our 2004 proposal to the Mellon Foundation, we noted the major themes embodied in the University Libraries' planning: supporting distinct communities of interest, developing a more mature digital library emphasizing integration of resources, and an overarching goal to position the Libraries as a strategic asset for the institution. These themes have featured prominently in the intervening time, and the University has recognized the value that the Libraries bring to institutional goals with significant budget increases: nearly 12% in 2005-06 and 7.5% for 2006-07. Funding has been increased for collections, salaries and staffing, and technologies.

## **TARGET COMMUNITIES**

The College of Liberal Arts (CLA) provided the planning context for this grant. Working with the dean, target communities were identified for study. Sixteen CLA departments in three main groupings defined the population for our assessment: Humanities, Area Studies and Social Sciences.<sup>1</sup> Units were distributed physically on the Minneapolis campus, on both “banks” of the Mississippi River. The primary library for these departments (Wilson Library) is located on the West Bank. Brief descriptions of the department groupings follow.

### ***I. Humanities Departments***

- Classical and Near Eastern Studies (Folwell/Nicholson Halls, East Bank)
- Cultural Studies and Comparative Literature (Folwell/Nicholson Halls, East Bank)
- English Language and Literature (Lind Hall, East Bank)
- French and Italian (Folwell Hall, East Bank)
- German, Scandinavian, and Dutch (Folwell Hall, East Bank)
- Spanish and Portuguese Studies (Folwell Hall, East Bank)

These departments share geographical proximity (all the above departments are located on the East Bank of the Minneapolis campus; by January 2006, all language departments were located together in Folwell Hall) and a commitment to interdisciplinary humanities scholarship through language, literature, culture, and history. The departments are also relatively strong and stable, both in terms of the number of graduate students they have and degrees they award, and in terms of the numbers of undergraduate students taught, not to mention the professional contributions of the faculty. These are departments that are generally growing, either as a result of national reputation or because of the high number of students studying foreign languages, or both.

### ***II. Area Studies Departments***

- African American and African Studies (Social Science Building, West Bank)
- American Studies (Scott Hall, East Bank)
- American Indian Studies (Scott Hall, East Bank)
- Asian Languages and Literatures (Folwell Hall, East Bank)
- Chicano Studies (Scott Hall, East Bank)

Spread across both sides of the Mississippi River on the Minneapolis campus, these are generally small departments (African and African American Studies is the exception, with a faculty of 19, but the other departments each have a core faculty of 6). Departments such as Asian Languages and Literatures (ALL) have made a number of new hires in the past few years in an attempt to strengthen a

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<sup>1</sup> Not all CLA departments were included in the study.



changing and ambitious program. ALL is focused on the interdisciplinary dimensions of Asian studies, including media studies, cultural studies, literary theory, philosophy, and gender studies, in addition to its attention to literature and language fields. Likewise, Chicano Studies is a growing department, with a new undergraduate curriculum focused on history, literature, gender studies, folk culture, and labor history, among others. The department also encourages community involvement and action through a number of partnerships with Latino and Chicano organizations in the Twin Cities.

With a core faculty of four, American Indian Studies is a small department split between language instruction (Dakota, Ojibwa, mostly taught by teaching specialists) and an interdisciplinary curriculum that includes courses on Indigenous History, photography, film, Anthropology, and literature. The oldest of the area studies departments, American Studies, founded in 1945, has a core faculty of only 7, though it brings in a sizable associate faculty of nearly 80. An average of 6 graduate students have defended their doctorates in American Studies every year for the past 5 years.

### ***III. Social Sciences Departments***

- Anthropology (Humphrey Center, West Bank)
- Geography (Social Sciences, West Bank)
- History (Social Sciences, West Bank)
- Political Science (Social Sciences, West Bank)
- Sociology (Social Sciences, West Bank)

All of these departments are located on the West Bank. Anthropology is the smallest of these departments, with a full-time tenured faculty of 15. History, by contrast, has 42 full-time tenured faculty members. The Department of Geography, one of the top-three programs in the country, has 22 tenured faculty members and is actively engaged in hiring new assistant faculty.

## **METHODOLOGY**

The methodology of the study included several components in order to best capture the individual and discipline-based practices and needs of humanities and social science researchers. The project team worked collaboratively to design the methodology of the study and structured its activity to engage Libraries staff throughout to ensure the assessment process would be a component of Libraries' overall planning. Our methodology included: literature review, interviews with departmental chairs, faculty interviews, graduate student focus groups, and a comprehensive survey of faculty and graduate students. These are described in detail below.

### ***I. Project Team***

Wendy Lougee, University Librarian (as PI) and Steven Rosenstone, Dean of the College of Liberal Arts played lead roles framing the project to respond to organizational and institutional goals. The Associate University Librarian for Academic Programs (Karen Williams) and CLA Associate Dean for Planning (Robert McMaster) were critical players guiding the implementation of the assessment process. Two project staff – the Library Project Coordinator (Kate McCready) and Postdoctoral Research Fellow (Cecily Marcus) were responsible for the project's execution, including all data collection. Graduate assistants John Troyer, Laura Purcell Gates, and Karen Steigman also contributed to the data collection. As the project shifted focus to the development of a prototype for virtual communities, several staff from the Digital Library Development Laboratory were engaged (Director John Butler, Shane Nackerud, Paul Bramscher).<sup>2</sup>

### ***II. Background Resources***

Early in the project, a thorough review of relevant scholarly literature was undertaken. This review has included literature in the field of library science, as well as scholarly associations and other sources. A full bibliography of the project has been compiled.<sup>3</sup>

In preparation for interviewing faculty and graduate students, project staff met with the subject liaison librarians who develop collections and serve the sixteen departments in the study. Each library liaison was surveyed concerning the process for collection development for the subject area; what methods of communication were employed with the department; what instructional and research assistance services were offered; and what funds were allocated to the department's collection areas.

A critical first step in communicating about the project involved consultations with faculty chairs of each of the selected departments in order to identify discipline

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<sup>2</sup> For project staff biographies, see Appendix 1.

<sup>3</sup> For project bibliography, see: <http://www.lib.umn.edu/about/mellon/docs.phtml>

and field specific needs, challenges, and unique characteristics. These conversations, conducted by the Postdoctoral Research Fellow, addressed trends in scholarly communication, questions of interdisciplinarity, collaborative work within the field, and general traits of the discipline as a whole. We also asked departmental chairs to identify faculty members whom we would later contact for individual interviews. The faculty members identified were meant to represent a broad range of methodologies, ages, rank, and research interests.

### ***III. Interviews & Focus Groups***

#### **A. Faculty Interviews**

With the help of departmental chair recommendations, we conducted a series of individual interviews with faculty members in each of the selected departments. Interviews last an average of 45 minutes. For small departments (with between four and ten faculty members) two interviews were conducted; for larger departments, between three and five interviews were conducted. Summaries of each interview were compiled.

The purpose of the interview was to capture the practical and conceptual challenges of a faculty member's research. Faculty were asked to describe a current research project and to comment on the physical and methodological activities they generally undertake in the course of their research. Interdisciplinary and collaborative research was addressed, as well as questions of financial support for research-related activities. In addition, we discussed the role of libraries and archives (physical and electronic) in research, the role of technology, and the kinds of tasks performed by graduate student research assistants.

The third part of the interview centered on questions about research materials that the faculty member amasses over the course of his or her research, methods of organization and storage, and questions of accessibility of the research materials collected. Finally, the faculty member was asked to describe his or her ideal research environment. Each interview was taped with the permission of the interviewee, and the interviewer took hand-written notes. Cecily Marcus and Laura Purcell Gates transcribed the interviews, and Cecily Marcus and Kate McCready undertook the analysis of the transcriptions and notes. We tracked common themes based on the areas of: general and library research, interdisciplinary and collaborative research, and organization and storage practices.<sup>4</sup>

#### **B. Graduate Student Focus Groups**

A series of roundtable lunchtime discussions was conducted with small groups of graduate students (6-8 participants). The first two groups focused on the general population (graduate students in the sixteen selected departments); the third

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<sup>4</sup> For Interview script, see Appendix 2.

targeted graduate students working in the social sciences. These three focus groups used the same semi-structured interview script as the individual interviews with faculty, with modifications to emphasize the processes of learning research methods. The focus groups lasted approximately 90 minutes. Each session was tape recorded, with the permission of each participant, and hand-written notes were taken. The moderators were the Project Librarian and the Postdoctoral Research Fellow. Graduate Student Research Assistants for the project were occasionally present. Lunch was provided to encourage an informal and candid conversation about graduate student research needs and practices. Cecily Marcus and Laura Purcell Gates transcribed the interviews, and Cecily Marcus and Kate McCready undertook the analysis of the transcriptions and notes.

### **C. Office of Information Technology Interviews**

Meetings were scheduled with the staff of the College of Liberal Arts Office of Information Technology to determine the current structure for faculty and graduate student technology support. These meetings broadly identified the configuration of the networks for the sixteen departments, the data storage capacities provided, and what general technological support is provided to facilitate the research activities of scholars within CLA.

## ***IV. Survey Development, Content, and Management***

A Survey of CLA faculty and graduate Students (in target departments) was conducted, beginning in fall 2005.<sup>5</sup> The focus of the survey was research practices in the humanities and social sciences. The survey was designed in collaboration with the Minnesota Center for Survey Research at the University of Minnesota. The administrative coordination of the survey was provided by MCSR Director, Rossana Armstrong. MCSR Survey Manager Pam Jones was responsible for conducting the pretest, revising the survey instrument, data collection, coding and editing, and writing the methodology report. Data Manager, Anne Caron, was responsible for ensuring data accuracy, conversion of the raw ASCII data into an SPSS system file format for analysis, and merging web and mail survey data into a single file.

Survey questions were shaped based on the analysis of interview and focus group data and addressed primary descriptive information that would characterize discipline-specific research needs and behaviors. The initial draft of the questionnaire was developed by Kate McCready and Cecily Marcus of the University Libraries. Working with MCSR, revisions to the survey were made by Pam Jones and project staff. The draft instrument was pre-tested both via the web and as a mail survey. In late August, eight faculty members and seven graduate students were sent email invitations to complete the web version of the pretest, and six faculty members and six graduate students were sent paper

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<sup>5</sup> For Survey Instrument, see Appendix 3.

copies of the survey. Following the pretest, minor revisions were made to the questionnaire.

The first questions in the survey asked respondents to provide information about their research practices and included questions about where research is conducted, the types of methodologies and materials used, the importance of various resources, challenges or problems experienced during the research process, the effectiveness of personal methods for select research tasks, how information is shared, use of research assistants, and funding sources for research.

With respect to interdisciplinary and collaborative research, respondents were asked to indicate in what ways their research is interdisciplinary and how that affects their research needs and practices, as well as answering questions about the collaborative nature of their research and obstacles encountered. Respondents also were asked about the importance of the University Libraries for various aspects of their research process, how often they physically visit the University Libraries for selected tasks, how often they visit the University Libraries' website for information or service, and what resources or services they wish the University Libraries would provide that are currently unavailable.

Questions relating to individual strategies for organizing and managing research resources asked respondents how they manage citations, their storage methods for materials they acquire in a physical or digital format, what factors influence their methods, and the adequacy of those methods. In addition, respondents were asked questions about any special or unique materials they may have gathered and to describe one of their current scholarly/research projects. Finally, organizational questions asked faculty respondents to indicate their department, position and rank, and the availability of graduate student support for their research. Graduate students were asked if they work as a research assistant, what degree they are pursuing, and whether they are currently writing their thesis or dissertation.

Web and mail data collection was conducted from August 29 to November 8, 2005. A total of 568 questionnaires were completed (413 graduate students and 155 faculty members) out of 1,147 possible respondents, resulting in an overall response rate of 50 percent.

### **A. Survey Population**

Current faculty members and graduate students in 16 CLA departments at the Twin Cities campus of the University of Minnesota were the two groups comprising the population for the study. The list of faculty members was provided by the University of Minnesota - Office of Human Resources. Included in the list were faculty in the 16 CLA departments having either regular appointments (tenure/tenure track), or term appointments (non-tenure track, such as contract, temporary, visiting, adjunct, and clinical). Both faculty with and

without pay (those on unpaid leave or external funds) were included in the population.

The list of graduate students (Masters or Ph.D.) was provided by the University of Minnesota Office of Institutional Research and Reporting. The list included graduate students registered for the 2005 fall semester at the Twin Cities campus in academic programs affiliated with the 16 CLA departments.

Because very few changes were made in the survey following the pretest, the pretest sample was combined with the main sample. Therefore, a total of 300 faculty members and 847 graduate students were asked to complete the survey.

### **B. Web and Mail Data Collection Procedures**

Jen Tantzen of the University of Minnesota Digital Library Development Lab was responsible for programming the web version of the survey. To initiate data collection, an email message from Wendy Pradt Lougee (University Librarian) and Steven Rosenstone (Dean, College of Liberal Arts) was sent on September 15 to all CLA faculty members and graduate students selected for the study. The message introduced them to the study and informed them that they would soon be receiving another email message about completing an online survey. On September 20, an email message with a link to the web survey was sent to all faculty and graduate students who received the initial email message.

A reminder email message was sent to all target faculty members and graduate students selected for the study on September 27. The message thanked individuals if they had already completed the questionnaire and asked them to take time to complete the survey if they had not already done so. On October 3, a postcard reminder was sent to all individuals who had not yet completed the online survey. The postcard was sent to faculty members at their office address via campus mail and to graduate students at their home address via US mail. The mail postcard thanked individuals who had already completed the survey and asked those who had not to go to a specific web address to complete the survey.

To further encourage response to the survey, a paper copy of the questionnaire was sent on October 11 to individuals who had not yet completed the online survey. Included in this mailing were a cover letter from Wendy Pradt Lougee and Steven Rosenstone, a paper copy of the survey, and a self-addressed envelope. As with the previous mailing, faculty surveys were sent through campus mail and graduate students received their mail packet via US mail.

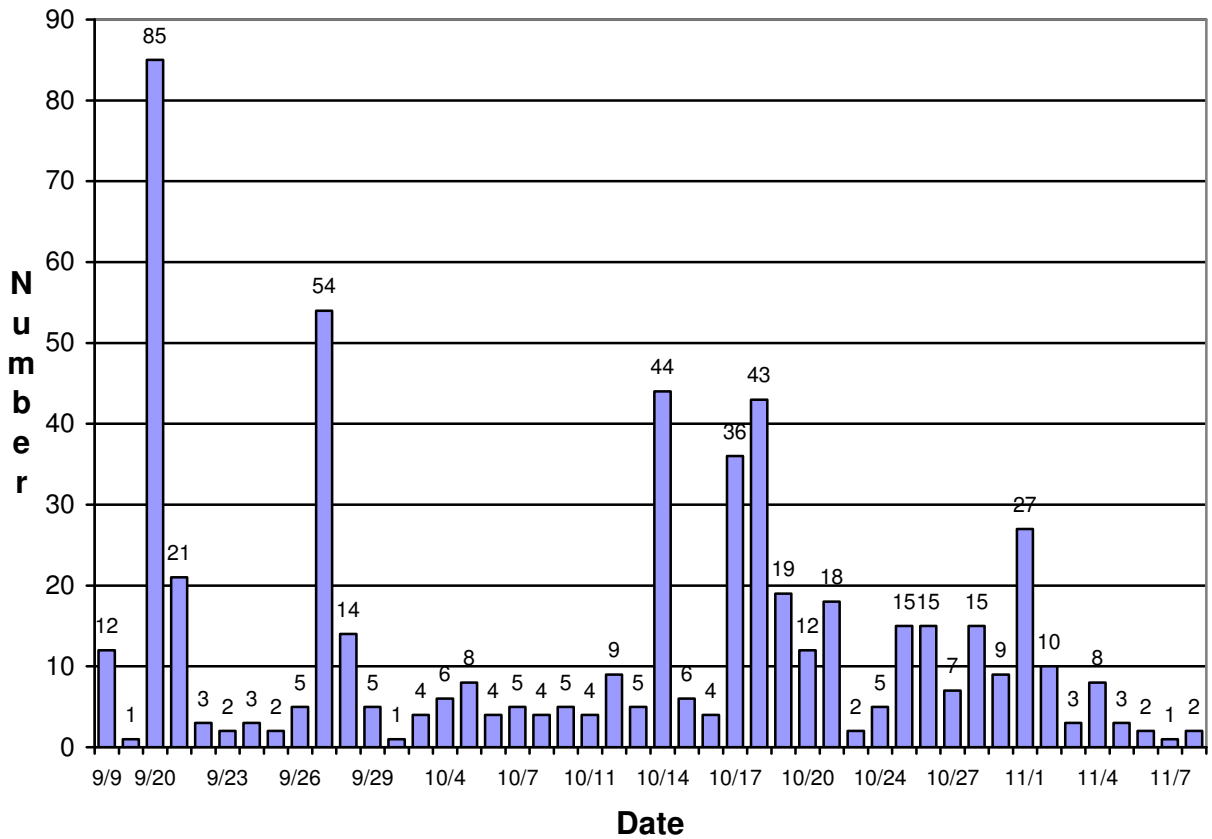
Two final reminders were sent to non-respondents. On October 18 another reminder postcard was mailed, and an email reminder message was sent on November 1 to graduate students and November 4 to faculty members. Both messages asked individuals to complete either the online survey or the paper survey.

The mailings of the paper surveys and postcards were completed under the supervision of the Survey Manager. Quality checks were made prior to sealing the envelopes to ensure that the survey packets were complete and that the address labels and survey identification numbers matched.

**C. Survey Returns**

The return date for the online surveys was electronically tracked, while returned mail surveys were hand counted to track return date and response rate. Peak survey returns occurred within a few days after each email contact or mailing and illustrate the importance of multiple contacts with survey participants to ensure a high response rate (see Figure 1).

**Figure 1: Number of Completed Surveys by Date**



**D. Survey Data Coding and Management**

Editing and coding for the paper surveys included four major tasks. First, all surveys were checked for response clarity to eliminate dual responses when single-answer responses were sought, or to create a separate category for dual

responses. Second, the coder/editor recorded responses to "other-specify" questions. Next, responses for two open-ended questions (Q14 and Q30) were reviewed, response categories created, and value labels assigned. Finally, responses to the remaining open-ended questions (Q21, Q33, Q38) were transcribed.

Editing and coding were done by a coder/editor who attended a training session to familiarize her with the survey instrument. Unclear or ambiguous responses were directed to the Survey Manager for resolution. In addition, the Survey Manager conducted quality control and reviewed coded/edited surveys throughout this phase. For the web surveys, coding of open-ended questions was completed by the Survey Manager.

**Table 1: Final Sample Status of CLA-University Libraries Survey**

Status	Graduate Students		Faculty		Total	
	Number	Percent	Number	Percent	Number	Percent
Web surveys completed	214	25%	106	35%	320	28%
Mail surveys completed	199	23%	49	16%	248	22%
Refusal	1	0%	1	0%	2	0%
Survey not completed	433	51%	142	47%	575	50%
Eliminated:						
No longer in CLA	0	--	2	1%	2	0%
TOTAL	847	99%	300	99%	1147	100%
Response Rate	49%		52%		50%	

Completed questionnaires

After coding was completed, data from the paper questionnaires were keyed onto a data tape by a commercial data entry firm and a computer data file was prepared. Once a complete file of the questionnaire was constructed, it was examined systematically to correct data entry errors. Data cleaning involved the use of a computer program to evaluate each case for variables with out-of-range values. In addition, the file was examined manually to identify cases with paradoxical or inappropriate responses. The data file for the web surveys was also carefully checked to ensure the accuracy of the data and to identify any paradoxical or inappropriate responses. After both the mail and web data files



were finalized, the two files were merged together for further analysis. A total of 568 questionnaires was completed. Details are described in Table 1.

### **E. Survey Data Analysis**

The Questionnaire and Results report prepared by the Minnesota Center for Survey Research contained response frequencies and percentages for each question in the survey. The actual responses of all 568 individuals who completed the survey were shown for each question. Percentage distributions also were presented; "valid" percentages were computed after eliminating those who refused to answer, did not know, or were not required to answer a particular question.

Data provided by MCSR were further analyzed by project staff according to the following breakdowns of target population: by faculty; by graduate students; by total; by department; by area (Humanities, Area Studies, Social Sciences); by status (MA coursework, MA thesis, PhD coursework, PhD Thesis, Tenure, Non-tenure); by position within departments (graduate student or faculty); and by position in area (graduate student or faculty).

The qualitative dimension of the survey results (instances in which respondents were asked to provide responses in their own words) were analyzed according to emerging themes and trends.

Data collected from interviews and focus groups were analyzed in four general areas: General Research Practices, Interdisciplinary and Collaborative Research, Library Research, and Resource Storage and Organization (see supplementary materials). We tracked emerging themes and trends among faculty, graduate students, by discipline, and by area.

## **DATA (RESULTS)**

### ***I. General Summary of faculty interviews and graduate student roundtable discussions:***

From over 50 individual interviews with faculty from 16 CLA departments and roundtable discussions with graduate students (all discussed in detail below) we were able to construct a general picture of scholarly practices and habits, and of the key challenges faced by scholars in the humanities and social sciences:

- Humanities and Social Science scholars are highly dependent on electronic resources and tools, but they are not always technologically savvy. Successful technological innovation must be easy to adapt to, and should fit well with established practices and habits.
- Improved support for interdisciplinary and collaborative research is a college-wide interest.
- Faculty and graduate students look for research tools and services that are centered on their needs, are flexible and customizable. Moreover, researchers value digital resources and tools that are intuitive and familiar.
- The degree of collaborative research that involves scholars from multiple institutions, suggests that digital tools and services developed for scholars at the University of Minnesota will need to be accessible to collaborators at other institutions.
- The range of information-intensive research activities that takes place beyond a library's walls suggests that the role of the library is expanding and unbounded.
- Archival research, increasingly important among scholars across disciplines, is particularly challenging due to the idiosyncratic organization of archives and the range and variety of materials housed within them. Many archives—foreign or domestic, public or private—do not represent their holdings in online catalogs, or do not conform to standards that allow easy discovery and access. Further, archival holdings are not represented in traditional databases and indexes. At the same time, the proliferation of digital archives demands new methods for successful discovery and use.
- Although faculty and graduate students report a need for assistance in a variety of areas of the research process (from bibliographic work to dissemination), many are slow to seek assistance. There is a need for services and tools that find the researcher, not the other way around.

- Graduate students lack stable physical space in their home departments and within the Libraries where they can work privately as well as collaboratively. Graduate students also lack basic research skills and often work by trial and error.
- Traditional venues for refereed publishing retain their importance despite the proliferation of new genre of online publications and open access initiatives.

## ***II. Faculty Interview Data***

### **A. Faculty Interviews: Overview**

Over 50 interviews were conducted, providing valuable discursive and anecdotal data to our study. Some general trends are evident:

- Most researchers consider their work to be interdisciplinary by nature, because of the materials they use and the methods they employ.
- The majority of scholars consult and collect a wide array of primary research materials, including notably high usage of archival materials.
- The organization and storage of collected print and electronic resources (for a single project or over the course of a career) are idiosyncratic at best, haphazard at worst. There is a general desire for improved assistance or better methods/tools of resource organization for the individual scholar.
- There is little thought given to the longevity, preservation, or accessibility of accumulated research resources due to constraints on time, funding, storage space, and lack of expertise.

### **B. Faculty Interviews: General and Library Research**

Faculty in the humanities and social sciences are joined by three main characteristics as they engage in research activities within the library and outside of it. First, their research habits are generally a variation on or continuation of skills they developed as graduate students:

“I learned from my professors in graduate school how to go and do [research]—seeing how my professors did archival research – and having access to archives where there was a support staff that was eager to show you how to do those basic things.” (Faculty interview, July 2005)

Second, they place top value on electronic resources due to efficiency and ease of access, but also want access to the physical resources held within libraries. A geographer comments:

“I do really worry about the library, the future of libraries, in the electronic era. And I don’t know what to do about it. In part I don’t know what to do about it because I use the Internet more than a lot of people, but I still, part of me would really like to get the students to use the books more, but I don’t know how, I can’t teach the way I do – using electronic devices – then get them to use the books.” (Faculty interview, September 2005)

From an assistant professor in Chicano Studies:

“I am physically in my office a lot... doing searches on the computer, sitting at my desk. If I had to explain to someone who had no idea what I do when I’m not planning a lecture, when I’m not teaching, I’m searching for something. I’m thinking about what I need to search for, to answer whatever question I want to answer. Whatever interests me at any given time. Or monitoring – that’s a good word – I’m monitoring developments. I’m constantly reading newspapers...at least six international newspapers a day, skimming several times a day, to see what’s been posted, the latest developments, here and there. Mostly international sources, available online. And that’s pretty much every day.” (Faculty interview, September 2005)

Third, faculty come to the Library infrequently, instead depending heavily on interlibrary loan and book/document delivery services, digital databases, indexes, and archives, as well as full-text electronic articles.

There is little agreement on what constitutes an ideal research or working environment, but many scholars describe a physically comfortable space with good light and up to date copy machines and computers that is inviting for solitary and collaborative work. Immediate access to all needed source material is prized, as well as secure spaces for storing books, journals, coats, computers, and bags. Few scholars are accustomed to thinking of the library as a genuine partner in scholarship, though many wish that the Libraries were used more as a laboratory for humanists—a place for deep contemplation as well as active interaction with subject specialists, rare or under-used materials, and other scholars.

### **C. Faculty Interviews: Interdisciplinary and Collaborative Research**

The importance of interdisciplinary research is striking across the humanities and social sciences. Nearly every faculty member interviewed considered his or her work to be interdisciplinary as a result of the kinds of literature on which the research is based, the methods used, and/or the colleagues with whom he or she consults or collaborates. This consideration appears to be unrelated to age or position (assistant, associate, or full professor). Faculty acknowledged the value of interdisciplinary research as being able to reach larger audiences and have a potentially broader scholarly impact. An assistant professor of African American History noted:

“My manuscript is actually quite interdisciplinary in the sense that I’ve written many parts of it with the understanding that I’m talking to other scholars outside of history, outside of my own trained disciplinary field. Talking to American Studies scholars, or sociologists, African American Studies as a department here is an interdisciplinary department. So although I’m an historian, I interact on a daily basis with sociologists, psychologists, humanists, American Studies, Cultural Studies.” (Faculty interview, November 2005)

Others expressed the ways that their work has benefited from sources and scholarship from outside their core fields. A professor of American Studies said:

“I’m an historian, and I was using materials gathered by social psychologists [polling data from the 1950s in America]...that was a phenomenal source for a book I did on the 1950s.” (Faculty Interview, November 2005)

An anthropologist commented:

“When you work in an interdisciplinary field, or when you take on a topic which becomes a field (which is what happened to me, and part of my interest in it becoming a field, of course), you come up against different people thinking different things are important, right? Which has really contributed to my project, I think. Because I’ve really had a lot of input from literary theorists, and a couple of feminist scholars, a couple of people who are invested in a much more sort of political economy perspective, who have really significantly shaped my work. So that was very useful.” (Faculty interview, September 2005)

At the same time, some faculty did express concern that a core discipline could suffer as a result of a heightened interest in interdisciplinary for its own sake, or that interdisciplinary research would be viewed by publishers, journal editors, and peer reviewers as “too interdisciplinary”:

“I’ve sometimes feared that my book is now going to be this hodgepodge of multiple different disciplinary perspectives, but that’s really the feature of this kind of work. And actually, I think, increasingly in most people’s work in the social sciences, [it is this way]. In the current intellectual academic environment, you just can’t take on an object like transgender and not read literary theory, right?” (Faculty interview, September 2005)

An assistant professor in Political Science commented:

“Doing work on race, class, gender, sexuality is by default interdisciplinary. Sometimes I think that means my colleagues in Political Science don’t think it’s at the center of the discipline, and that’s what makes it

interdisciplinary...So certainly in the sources, and the questions I ask cross disciplines.” (Faculty interview, November 2005)

An assistant professor in French said:

“Part of the biggest hurdle for me in my research is proving to myself that I know the French literature well enough to go then use these multiple tools: literary theory, historiography, feminist theory, architectural history, landscape architecture, etc.” (Faculty interview, July 2005)

Other challenges posed by interdisciplinary research include:

- Identifying diverse collections necessary for research
- Negotiating different evidentiary standards across disciplines
- Difficulty knowing which norms must to be fulfilled to be convincing in various fields
- Increasing difficulty defining one’s scholarship in a single field—possible culture clash between or among disciplinary histories
- Knowing where to publish, and if journals outside one’ immediate field will count for tenure and promotion
- Not knowing whom to ask for counsel when everyone in a department works in strikingly different areas

This final point illustrates how “disciplinarity” is rarely assumed to be equivalent to “department”: historians, geographers, anthropologists, linguists, and literary scholars recognize the fact that their departmental colleagues engage in very different kinds of work and are sometimes joined by somewhat tenuous or structural ties. At the same time, the substantial amount of collaborative research engaged in by humanists and social scientists means that scholars consider their colleagues to be everywhere, regardless of discipline, department, institution, or country. An American Studies professor commented:

“[Interdisciplinary scholarship] offers a lot of opportunities, I learn from colleagues in different fields about different approaches, so that’s helpful... I’ve been part of an ongoing research group for a long time, and that is interdisciplinary, just sharing each other’s work. You get together, talk about it, share things over email, and then in traditional ways like going to conferences.” (Faculty interview, October 2005)

For researchers who work in small sub-fields, the community of colleagues is necessarily national and international, and opportunities for collaboration are ample given the small number of scholars with given specialization. An archaeologist in the department of Classics and Near Eastern Studies commented that the small number of specialists in a given field encourages sharing and collaboration:

“We really all build upon one another, and we all require each other’s work. And the truth is that very few things are reexamined. There’s so much out there, and there’s so few of us.” (Faculty interview, September 2005).

Contrary to the image of the solitary humanist working alone in her office surrounded by books and papers, humanists and social scientists alike spoke about the benefits and challenges of collaborative research. Faculty from Classics and Near Eastern Studies, Spanish and Portuguese Studies, Asian Languages and Literatures, American Studies, History, Political Science, Sociology, Geography, and Anthropology all spoke pointedly about the importance of collaborative research for scholarship, and the need for investment in services, institutes, and tools that facilitate it. According to many scholars, successful collaborative research requires ample time, recurring funding, stable meeting spaces, and administrative assistance that supports travel, data storage and sharing, and grant writing. Nearly all agreed that none of these resources are available at an acceptable level, and yet they manage to accomplish a good deal. Benefits of collaboration include:

- Value of talking about research as it is being done, not just when it’s finished
- Meeting and working with interesting colleagues from all over the world
- Building lasting relationships with other scholars; learning new things (“staying sharp”)
- Doing different things from what one did at the start of one’s career
- Providing substantive opportunities for graduate students to immerse themselves in all aspects of scholarship and publishing, and having the opportunity to work with the rising stars of the field

Collaborative research, though beneficial, is also difficult, according to many scholars. On the role of space and place, a geographer commented:

“It seems like there’s almost no substitute for random meetings in the hallways. I used to work for a software company that was purposely designed to have all these alcoves and wide hallways with whiteboards just hanging there, purposely centered places to get coffee, so everyone had to get out of their office and do that...that provides shared spaces for accidents and unplanned meetings. I rely on information technology almost exclusively, so email and phoning, a little bit of video chatting, and so I’m trying to do this, but there’s no substitute to, you know, getting on an airplane and spending at least three or four days someplace, seems to be the minimum amount of time now. And I think we’re seeing this in a number of large grants geared more toward collaborations within a single university. So I like to use information technology, but it’s not as good as face-to-face.” (Faculty Interview, October 2005)

Besides the challenges regarding space, time, and funding, problems surrounding the evaluation of collaborative work are similar to that of interdisciplinary work.

#### **D. Faculty Interviews: Resource Organization and Storage**

The organization and storage of research materials is a subject of significant interest for researchers. They concern themselves not only with methods of classification developed by librarians and archivists, but also, and most immediately, with their own methods of organizing and habits of collecting. Humanists and social scientists are practiced “archive and collection makers” in their own right, amassing unique collections of primary and secondary materials over the course of a single project or an entire career. On the whole, these collections are not accessible to other researchers, except at the level of individual loans to known colleagues.

Methods of organization are haphazard, idiosyncratic, and often bordering on untenable. At the same time, researchers engage in more structured and intentional activities—scanning and digitizing archival materials and working with experts to make those materials accessible online or through searchable databases; storing large data sets and thinking about how to preserve data from multiple media; building substantial archival collections with idiosyncratic organization and naming practices; and sometimes planning to donate materials to a specialized archive or institution.

On the whole, though, most researchers are not so complete in their efforts. An archaeologist said, “In my field, archiving is the responsibility of the researcher...it’s an imperfect, irregular system” (faculty interview, September 2005). A professor of German Studies is a fan of piles: “My piling system can produce beneficial results through its randomness...When a project is complete, the amassed archive lies around” (faculty interview, October 2005). A Cultural Studies professor laments the constant accumulation of piles: “I have piles and piles, drawers and drawers, of photocopies of downloaded or copied articles and other materials. There is a constant summer pledge to clean up and organize” (faculty interview, July 2005). A sociologist, on the other hand, wants more space for bigger piles: “It would be ideal to have “three different spaces to work on [three ongoing] projects. I mean, I’m not saying I should have that, but it all bleeds into each other, and gets mixed up” (faculty interview, September 2005).

### ***III. Graduate Student Roundtable Data***

#### **A. Graduate Student Roundtable Focus Groups: Overview**

Three graduate student roundtable discussions were held, with 23 graduate students attending representing the following departments: Anthropology, Cultural Studies and Comparative Literature, English Language and Literature, French and Italian, Geography, History, Sociology, and Spanish and Portuguese



Studies. It proved to be more difficult to convene graduate students than to meet with individual faculty, and though various incentives were offered (lunch, coffee), and our willingness to go to graduate students (to meet in their offices and meeting spaces), we cancelled four roundtables due to lack of participants. However, we did gather important information from graduate students that in many ways mirrored commentary from faculty. Some key differences, though, did emerge:

- Graduate students lack general library research skills and are largely unaware of many library services offered (classes on graduate research, library liaison program, RefWorks citation management software tutorials)
- Graduate students look to their faculty advisers for research support and information on grant and publishing opportunities

### **B. Graduate Student Roundtable Focus Groups: General and Library Research**

- Graduate Students routinely use archives and archival materials for their major research projects.
- Graduate students lack general archival research skills and knowledge about archival research protocol (letters of introduction, how to physically handle archival materials, how to plan archival research trips abroad). One graduate student commented:

“Doing primary source research is profoundly different than doing anything else... And I didn’t have any idea of that until I went. And ...it took me, you know, the ten days...in this other archive, I’d probably spent six or seven days before I figured out what I had to do, and what it looked like to do this kind of work, and how do you spend time.” (Graduate student roundtable, September 2005)

- Graduate students report not having stable, physical space to work and store materials.
- Graduate Students are lacking knowledge on basic research skills and library research practices. Education opportunities include teaching about traditional research methods (find a key article/book and follow the bibliography), cited reference searches, scheduling appointments with subject liaisons, differences between catalogs and indexes, how to search indexes and how to identify trends in other fields (outside of primary discipline)
- Graduate students are slow to ask for assistance from librarians, or to know who their department's library liaison. One said:

“What is the structure of the librarians in the library? Like, there are a lot of librarians that don’t sit out on the floor, right? ....And we don’t have access to them, do we? [Laughter, murmurs of assent] Somebody...is buying every cutting-edge, intellectualist, postmodern fiction book. And they know them all, because they’re reading these things, or putting them out, and they’re buying all these books....I want to talk to that person, you know?” (Graduate student roundtable, July 2005)

- The proliferation of digital research materials does not diminish the need for traditional research skills.

### **C. Graduate Student Roundtable Focus Groups: Interdisciplinary and Collaborative Research**

- The majority of graduate students do some form of interdisciplinary research. Most interdisciplinary research is based on integrating materials from multiple fields to strengthen, enhance or broaden the primary research:

“...I’ve been doing research on my dissertation for a about a year, a year and a half. And it encompasses history, philosophy and theory, literature and poetry – fiction, poetry, American mostly – and also architecture.” (Graduate student roundtable, July 2005)

“...I am from Anthropology, I focus on medical anthropology... so I cross a number of disciplinary boundaries in my immediate work. And a number of kinds of databases. Searching Medline is very different from searching [the Libraries’ online catalog] or any of the social sciences databases.” (Graduate student roundtable, July 2005)

“...Well, interdisciplinary to me means, it’s not really interdisciplinary, it means you have a discipline you’re really trained in, and then you’re trying to fake it in these other disciplines.” (Graduate student roundtable, July 2005)

- Few graduate students engage in collaborative research. Current computer systems (networks, etc.) do not support collaborative work. Collaborative work activities are field dependent.

## **D. Graduate Student Roundtable Focus Groups: Resource Organization and Storage**

- Graduate students report that their organizational methods and storage systems for their research materials are insufficient. Graduate students want simple ways of organizing citations, print materials, electronic articles, etc.:

“...It would be wonderful to have some kind of web page link where I could keep a listing of the things that I want for the next time I was in the library. Actually something almost like a spreadsheet that would be easier to organize so I can keep track of what I’ve gotten, what I’ve looked at, that sort of thing. And even to have the ease of having to copy and paste the reference.” (Graduate Student roundtable, July 2005)

“...If I don’t sit down and start reading [materials] that day, I probably actually won’t go back to it for maybe a year, or a couple months. Otherwise I just have these folders that just move around my apartment, full, like stacks of paper....But then I just started using RefWorks a little bit, and I’m sort of excited about that.” (Graduate Student roundtable, September 2005)

### ***IV. Survey Data***

The results from the survey were analyzed according to multiple comparative views: faculty, graduate students, department, area, position, and rank (tenured or non-tenured faculty; MA student writing/not writing thesis; PhD student writing/not writing dissertation), and role (faculty or graduate student) within departments and areas.

In addition, we ran correlative data queries such as: research methodology/research challenges faced; research materials used/interdisciplinary/collaborative research; research challenges faced/importance of Libraries; method effectiveness/citation management habits; information sharing methods/collaboration; and many more. In general, the correlative data was largely consistent with overall findings, especially as we were most interested in discovering major trends among researchers. As our analysis becomes more targeted and granular in future discussions of personalized and discipline-specific services and digital tools, these correlations will be an invaluable resource.

In order to present data from the survey, we have represented only key findings.<sup>6</sup>

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<sup>6</sup> For fuller survey data results, see Appendix 4.

## **A. Survey Data: General Research Practices**

[Note: Many questions allowed respondents to check multiple responses.]

### **Q1. Where do you work while conducting research?**

Scholars work from multiple places, but the prevailing favorite is the home office (76.5% of faculty and 78.1% of graduate students work primarily at home. University offices are also well-used for research (44% of faculty and graduate students), and the University Libraries are especially popular among humanities scholars (52.1% vs. 49.7% of social scientists). Among the least used work spaces were laboratories and non-University libraries.

### **Q2. What are your typical research methodologies?**

Presented with eleven research methods to choose among, researchers reported a great range and variety of methodologies employed. Textual analysis was the most commonly used method (84.4% humanities; 64.7% area studies; 41.3% social sciences; 58.7% total), followed by archival research (44.3% humanities; 79.4% area studies; 60% social sciences; 55.4% total). Archival research was also the most used method among social scientists.

Among the least used methods for humanists were: statistical and quantitative research (3.3% and 5.2%, respectively). Social scientists depended least on linguistic research methods (3.4%).

### **Q3. What research materials do you typically use in a project?**

Researchers use a variety of types of materials over the course of a single project. Published materials were by far the most heavily used among all populations (99.5% humanities; 100% area studies; 98.1% social sciences; 98.8% total).

Images and audio and video recordings also represent well-used materials (images 41.3% total; film/video recordings 25% total; audio 12.9%):

48.1% of social scientists rely on data sets and/or statistics, while such materials are used by only 7.5% of humanists.

### **Q4. When conducting research, how important are the following resources for finding information or materials?**

Library catalogs, online scholarly databases, and bibliographies are the favored resources for identifying research materials. 88% of graduate students and 75% of faculty also report that browsing Library stacks of very/somewhat important.

### **Q6. How much of a problem is the following when finding/acquiring research materials?**

In order to assess the sources of challenges faced by researchers we provided a number of possible choices: obscurity of topic, physical distance to University

Libraries, confusing organization of University Libraries, too many sources, too few sources, scholar's lack of expertise, lack of assistance, and lack of funds.

Main sources of difficulty were: **obscurity of topic** (58.7% humanities; 81.8% area studies; 52.7% social sciences) and **too few sources** (39.7% humanities; 48.5% area studies; 44.5% social sciences).

**Q7. For a typical research project, how effective are your methods for: tracking citations and sources; organizing and storing source materials, organizing and storing notes and drafts, keeping up with field/s, and disseminating research?**

Graduate students' methods for disseminating research are largely "somewhat" or "not very" effective, although challenges exist in all areas. Graduate students and faculty all report difficulty organizing notes, drafts, and research materials, and all report challenges keeping current in their respective fields.

**Q8. How do you typically share source materials?**

Email is the predominant mode of sharing materials (66.8% total), followed by hard copies (59.7% total) and meetings and conferences (31% total).

**Q9. How do you typically share co-authored works with collaborators?**

Email is also the predominant mode of sharing versions of co-authored works (49.3% total) followed by hard copies (32.5% total) and meetings and conferences (21.6% total)

**Q10. How do you typically share ideas?**

Ideas are shared most by email (77.8% total) and at meetings or conferences (69.5% total). Hard copies and phone are also important (27.1% total; 24.4% total).

**Q11. If assistance were available, would you use it for the following: preparing bibliographies, acquiring sources, data collection, analysis/synthesis, creating presentations/websites, editing, indexing, general organization, saving and storing materials?**

Assistance is most desirable for acquiring sources (93.3% total); preparing bibliographies (72.8% total); saving and storing resources (72.6% total); and general organization (71.7% total).

**B. Survey Data: Interdisciplinary and Collaborative Research**

**Q13. In what ways is your research interdisciplinary?**

We were interested in the various ways one might define interdisciplinary research. This was a consistent topic in all methods of assessment employed, but the critical mass of survey responses was especially useful.

For the majority of scholars the use of literatures drawn from various disciplines was at the root of interdisciplinarity (86.9% total). The combination of methods employed, often in a single project, was also cited as major factor (62.8% total), followed by the specializations of colleagues with whom scholars work collaboratively (36.5% total). Only a small percentage of researchers reported that they do not consider their work to be interdisciplinary (9.3% total).

**Q14. How does the interdisciplinary nature of your work affect your research needs and practices?**

Main responses, in scholar's own words, included a need to access more materials, library resources, archives, and institutions; need for research assistance outside of home field; increased opportunities to meet with researchers from other fields; need for more time to learn new disciplinary models, methods, and terminologies; and the generally exciting and fun nature of learning new things.

**Q16. How would you characterize your collaborative working group?**

68.5% of faculty and 42.9% of graduate students reported that they work collaboratively. Humanities scholars are more likely to work within a campus research group than social scientists (22.7% vs. 12%), and the majority of collaborative groups include colleagues in the same discipline at institutions other than the University of Minnesota.

**Q17. Which of the following are obstacles to working collaboratively: Distance from colleagues; distance from resources/libraries; lack of workspace; lack of rewards/incentives; other?**

The extra-institutional character of many working groups is the greatest challenge to collaborative work (distance from colleagues 40.8% total), followed by lack of rewards or incentives (39.3% total) and lack of workspace (22.8% total).

Other obstacles include: difficulty communicating over distance, lack of colleagues working on similar topics, scheduling conflicts/lack of time, disciplines that traditionally do not value collaborative work, and personality conflicts.

**C. Survey Data: Library Research**

**Q18. How important are the University Libraries for the following aspects of your research process: Resource for finding and retrieving; place for research or study; collector and purchaser; repository/preservation; developer of technology?**

The greatest divergence in response is by graduate students and faculty on the question of the library as a place for research and study (29% grad students/ 13% faculty; 24.7% total). Overall, scholars' perceptions of the role of the library are relatively traditional: the Libraries' most important roles are as a builder of collections (93.4% total), as a resource for discovery (80% total), and as a

repository for preservation (64.7%). The library’s role as a developer of technology is also quite important (39.3% total).

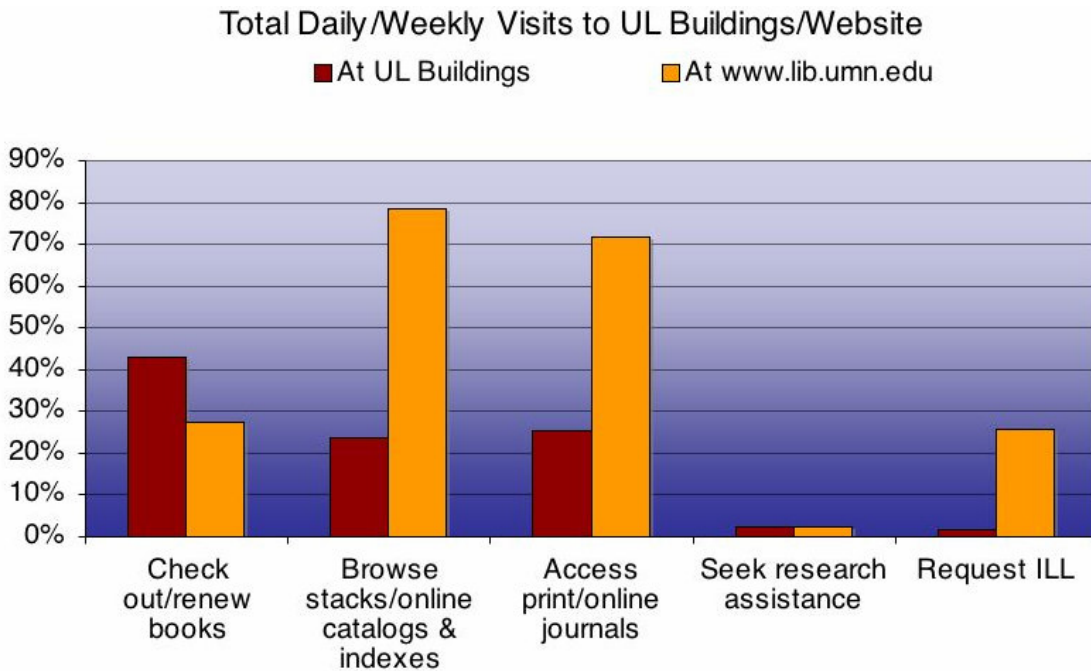
**Q19. How often do you physically visit the University Libraries to for the following reasons?**

Daily or weekly visits to the Libraries’ buildings are highest for purposes of checking out books (43.1%, total population), and graduate students use the Libraries’ physical spaces more than faculty for all reasons (checking out books, browsing stacks, accessing print journals, seeking assistance, using computers, and study and reading) excepting requests for inter-library loan materials and use of materials in Archives and Special Collections. Nearly 30% of graduate students come to the Libraries to study or read on a daily/weekly basis.

**Q20. How often do you visit <http://www.lib.umn.edu> for the following reasons:**

Use of the Libraries’ website surpasses daily and weekly physical visits in all similar categories, except for renewing books or seeking research assistance. Greatest daily/weekly use of the website is for accessing online indexes and journals (total: 78.4%; 71.6%). Social sciences use these services more than humanists on a daily or weekly basis (79.4% vs. 61.8%), while the opposite is true on a monthly or occasional basis (18.7% vs. 33%).

**Comparison of Visits to Library Buildings/Library Website**



**Q21. What services do you wish the University Libraries provided that are currently unavailable?**

Top answers included: more online subscriptions and digital collections, larger physical collection, increased research assistance, improved delivery and copying services, improved work/study spaces, more foreign language resources, and secure storage spaces for personal items.

**Q22. How do you primarily manage citations of books and articles?**

Social sciences and graduate students are more accustomed to using online or desktop citation management programs than humanists or scholars in area studies (36.4% social sciences; 8.2% humanities; 9.4 % area studies). More graduate students than faculty use citation management software (26.9% graduate students; 17.1% faculty). The most popular method of documenting citations is with a word-processing program (63.6% total).

**D. Survey Data: Resource Organization and Storage**

**Q23-24. How do you store the following physical materials?**

For print materials, researchers are not in the habit of scanning them for storage or organization purposes. Hard copies are generally preferred by all.

For print materials, 98% of total respondents file or store hard copies. Some (11.5% total) also make digital copies.

For audio/visual materials, 49.5% of total respondents file hard copies, while 16.8% store digital copies.

**Q26-29. How do you store the following digital materials?**

For born-digital resources (docs, jpegs, pdfs, etc.), many scholars duplicate copies in the process of saving or storing them—they print hard copies (60.7% total) and save digitally (78.9%), though more respondents prefer digital storage methods. Graduate students and humanists are more likely to make hard copies of documents than faculty and social scientists.

Factors that determine methods of storage include: space constraints, lack of technological skill, want/prefer hard copy, size of object, fear of computer failure, lack of printing access, lack of computer storage space, and original format of object.

**Q32. Scholars with unique research collections:**

Comments by scholars during interviews alerted us to the fact that some engage in collection and preservation activities on their own. 37.1% of scholars amass unique research collections. 56% of faculty engage in personal archiving activities.



**Q34. How valuable do you consider your unique collection to be to other researchers?**

49% of scholars consider their collections to be “somewhat valuable,” while 20.3% think they are “not very valuable.”

**Q35. How accessible to other researchers is your unique collection?**

The majority of unique collections held by scholars are inaccessible to other scholars (50.7%). Only 19.3% of researchers report that their collections are “very” or “somewhat” accessible.” Obstacles that hinder accessibility include:

	Total
Not enough time	81.8%
Lack of assistance	62.8%
Inadequate funding	54.8%
Lack of expertise	47.8%
Too much material	34.9%
Rapidly changing technology	32.4%
Diversity of materials	22.1%

Examples of unique research collections, in scholars’ own words, include:

- I've collected a fair bit of primary source material (proclamations, pamphlets, articles, plays) on Egyptian-French and Egyptian-British colonial/postcolonial relations in the 18th through 20th centuries; little-studied and/or little-known early Egyptian translations of European literary texts; periodical sources on ideologies and politics of national literature and of translation vs. authorship in early-20th-century Egypt; some material that establishes ties between French colonialisms in Egypt and Algeria and British ones in Egypt and India.
- Interviews with Muscogee Creek individuals in Oklahoma.
- Microfilms of 14th c. Southern French notaries.
- I have tapes, transcripts and translations of hundreds of interviews spanning 20 years of research. I have rare photographs and ethnographic objects. I have a map collection. Photocopies of rare documents.
- Digital photos of archival documents, especially manuscript letters.
- Archaeological artifacts, primarily ancient ceramics but also original field notes, inventory cards, and other primary excavation records.
- Approximately 40-50,000 slides, covering four continents and 30 years, mostly urban. A small number have been digitized.
- I have a great deal of hardcopy Russian newspapers from the 80s and 90s that I don't know what to do with.

## **DATA ANALYSIS**

### ***I. Main Emerging Themes***

Based on the survey data, interviews, and roundtable discussions we undertook a thorough content analysis. One of our first attempts involved identifying recurring themes and using those themes to describe general issues faced on a regular basis by scholars in the humanities and social sciences. Three main themes that became clear were: 1) physical and virtual space, 2) the use of digital resources, and 3) interdisciplinary and collaborative research.

### ***II. Space—Physical and Virtual***

Because our study was focused on the full range of research practices and activities rather than the role the University Libraries, we were interested in all forms of spaces that contribute to research and scholarship—both physical and virtual, within the Libraries and without.

At the same time, the idea of the library as place—for study, research, and contemplation—is as important for the University of Libraries as it is for academic research libraries across the country. We sought to capture this importance, or its relative lack of importance, by addressing the question directly in a number of ways. Our conclusions, drawn from our own data and compared to other related findings by the University Libraries in separate studies, find that the library as place is still valued as a cornerstone of scholarship and the scholarly community, even if physical use of the Libraries' buildings is less in frequency than online use. For 64% of graduate students, the Library is very important or somewhat important as a place for research and study; 39% of faculty agree. Nearly 30% of graduate students come to the Libraries to study or read daily or weekly, while only 8% of faculty come as frequently for the same purpose.

Faculty and graduate students expressed a keen interest in talking about the library as place, as they were quick to offer a number of suggestions on how to improve the physical environment of the Libraries. Some suggestions included:

- Adding more secure study spaces for grad students, with more comfortable chairs.
- Creating a “manuscript research room”
- Providing physical storage space for research and personal materials, including space for printed articles (lockers, coat check)
- Improving wireless access
- Building a coffee shop in the main Humanities and Social Sciences research library (Wilson Library) [in development, summer 2006]
- Making it easier to spend the day in Wilson (or at the Libraries) including easy parking, research space for study, lockers for personal items, and/or storage space for materials, etc.

- Creating more spaces for study—nooks and crannies, warm lighting, comfortable chairs
- Increased display of recent acquisitions [to be implemented summer 2006]

Departmental libraries and data and computer centers are present in twelve out of the sixteen departments included in our study. 11% of total respondents in the project's survey reported that departmental resources are "very important" to their research. At present, the holdings of departmental library collections are not included in the Libraries' online catalog and few are searchable online.

Departmental resources are generally not for use by persons outside of the given department. In interviews, and roundtable discussion, scholars commented that their departmental libraries are "stable" collections to which modest (or no) budgets are dedicated, and are often a heterogeneous collection of books donated by retiring professors, old journals in incomplete runs, and some graduate student dissertations. (Few departments currently require students to donate a copy of their dissertation upon completion of the degree.) Some departments, like Classics and Near Eastern Studies (CNES), maintain substantial CD-ROM collections. Cultural Studies and Comparative Literature (CSCL) has an impressive film, DVD, and video collection. Both departments make their resources readily available for teaching purposes within the department. American Studies has made efforts to digitize parts of its collection and make it available online, but it is a rare example.

### ***III. Digital Resources***

Throughout our study, the importance of digital resources—everything from electronic journals and full text articles to online databases and search tools—cannot be underestimated. This is as true for humanists as it is for social scientists, as both groups of scholars depend heavily on online scholarly databases and indexes to identify research materials (81% of humanists; 85% of social scientists), and access online journals daily or weekly (61% of humanists; 79% of social scientists).

Where humanists and social scientists differ, however, is best understood in terms of their own perceptions of their work and the digital resources dedicated to their fields of study. Humanists are at most risk of being surpassed technologically, and potentially intellectually, due to a lack of digital tools dedicated to humanistic pursuits. At the same time, humanists rely heavily on electronic resources for both discovery and creation of scholarly work. Humanists are quick to report that they do not fully understand how to reconcile their supposed lack of "data" despite the fact that their offices, workspaces, and hard drives are overflowing with the fruits of digital research: photocopies and electronic copies of downloaded articles and images; lists of electronic databases searched; electronically stored and printed out notes, drafts, and finished works.

Humanities scholars work with a range of materials and employ a range of methods that go beyond textual analysis. The humanities scholar no longer

needs only pen, paper, and books—now they use computers and hand-held scanners, digital audio and film recordings, images, and texts. Their methods of discovering and organizing resources, though, is often “less than effective,” according to their own assessments. Humanities scholars’ methods of saving and storing materials are idiosyncratic at best, haphazard at worst, leaving them vulnerable when it comes to completing single projects, or surveying the corpus produced over the course of a career.

Humanities scholars on the whole are slower than social scientists to adopt digital tools like RefWorks or Endnote (only 8% of humanists use an online citation management system; 36% of social scientists do).<sup>7</sup> Humanists are also in need of assistance with finding and identifying resources, acquiring resources digitally or physically, and keeping track of them, but are slow to seek assistance unless it is readily and easily available to them.

#### ***IV. Interdisciplinary and Collaborative Research***

Humanities scholars and social scientists pointedly struggle with keeping up with a proliferating number of scholarly interests and disciplinary trends, trends that often tip in the direction of interdisciplinary innovation. Data from our own research show that humanities scholars have a particular need for improved methods of keeping current in a number of fields simultaneously, while at the same time advancing their fields. Graduate students in the humanities are particularly in need of better methods of discovery and gathering—there is a pronounced desire to improve methods of collection and organization of scholarly resources, and a heightened sense of the importance of making an individual contribution to their field/s through original archival sources.

Scholars in all fields express sensitivity to core disciplinary focus and intellectual interests, as well as to interdisciplinary breadth and depth. Interdisciplinarity, a term often used but seldom elaborated, emerges as a common practice that hinges on the kinds of materials and resources scholars use, and the range of literatures on which scholarship is based; the methods employed; and the people with whom scholars work and consult. Academic scholars do not view their scholarly community as limited by the boundaries of their department or their university.

Instead, the world of scholarship is national and international in focus, and dependent on access to resources and scholars from around the world. Any tools that assist in facilitating and sustaining this access must reflect the unbounded nature of humanities scholarship through technological flexibility and interoperability.

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<sup>7</sup> Presently, the University of Minnesota is the largest installation of RefWorks (web-based citation management software) worldwide, with over 11,000 personal accounts maintained by undergraduates, graduate students, faculty, and staff.

At the University of Minnesota, interdisciplinary research is a longstanding tradition and commitment. The department of American Studies, a model of interdisciplinary scholarship and teaching, is over sixty years old, and the department of Cultural Studies and Comparative Literature is one of the oldest interdisciplinary humanities programs in the country. The College of Liberal Arts' dedication of interdisciplinary excellence is also evident in its recent recruitment strategy that draws a cohort of scholars without targeting specific departmental positions. While these faculty then identify a departmental home, the focus is clearly on interdisciplinary research and teaching.

The influences on interdisciplinarity from beyond the university can be measured by the range of respected, peer-reviewed journals in a number of fields that value interdisciplinary focus, as well as the growing number of professional placement opportunities that demand a range of skills and intellectual expertise. There has also been rapid growth of sub-fields and specializations that cross disciplinary lines, such as film studies programs that depend heavily on literary and critical theory; architecture programs that study the growth of suburbia in all of its pop cultural and social dimensions; trends in fields like Anthropology that explore everything from gender, musicology, political groups, and more; and the field of cultural geography. At the University of Minnesota, Asian and East Asian scholars are especially indicative of interdisciplinary trends, and experts in the fields of History, Political Science, Art History, Cultural Studies and Comparative Literature, as well as Asian Languages and Literatures, all go beyond their respective "disciplines" in their scholarly work.

The growth of electronic resources (indexes, digital archives, repositories, finding aids) that address interdisciplinary scholarship have also proliferated, leaving many scholars, as a result, unsure of how to effectively address the various fields their interests span. Only 31% of scholars at the University of Minnesota reported that they consider their methods "very effective" for finding and keeping track of materials. Only 11% consider themselves to be "very effective" at keeping up with their fields of interest.

With the University of Minnesota's effort to become one of the top public research institutions, there is a concerted effort to identify core areas for improvement, development, and investment. Graduate education, collaborative research, and "discipline evolution"—attention to the needs and future directions of scholarly fields—have emerged as key targets of discussion. All three areas face challenges due to their dependence on excellence in interdisciplinary research. The University is seeking ways to make sustainable investments in the resources, both physical and virtual, and infrastructures that support these forms of research.

## ***V. Primitives—Tools of Analysis, Ways of Thinking***

In analyzing themes from the project's data we found John Unsworth's concept of scholarly primitives useful to structure our analysis and frame possible future

directions. Unsworth defines primitives as “basic functions common to scholarly activity across disciplines, over time, and independent of theoretical orientation.”<sup>8</sup> “Discover,” “Gather,” “Create,” and “Share” emerged as the most helpful categories that allowed us to understand the data not from the point of view of our research themes (general research, library research, interdisciplinary and collaborative research, resource organization and storage) but instead from the reported activities in which scholars were regularly and consistently engaged. These four primitives best described the range of activities undertaken by scholars throughout the research process. Other possible primitives (annotate, compare, refer, present, etc.) seemed to fit well within our four primary categories. “Discover,” “Gather,” “Create,” and “Share” also represent stages of the research process, but are not always discrete steps in practice. Most researchers engage in multiple research phases and activities at once, as the research process is not necessarily linear. Rather, it is an iterative and multi-dimensional process that involves as much back-tracking as forward movement towards completed scholarship. And then there are the many scholars who say that scholarship is never finished, as it is always subject to revision, re-thinking, expansion, and more research. The use of primitives allowed us to reflect on the necessary interrelatedness of stages in the research process.

### **Primitives:**



Activities relating to “discover” include all kinds of searching, whether serendipitous or structured, that lead to finding and identifying resources, materials, and forms of assistance relevant to scholarship. Discovery has as much to do with locating institutes, offices, and services (grant and fellowship

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<sup>8</sup> John Unsworth. “Scholarly Primitives: What Methods Do Humanities Researchers Have in Common and How Might Our Tools Reflect This?” “Humanities Computing, Formal Methods, Experimental Practice” Symposium, Kings College, London, May 13, 2000.  
<http://jefferson.village.virginia.edu/~jmu2m/Kings.5-00/primitives.html>

offices, libraries and special collections, or laboratories) on campus as with identifying libraries and archives nationwide or abroad. Discovery encompasses the full range of bibliographic searches for scholarly projects, as well as efforts to keep up with a scholarly field or fields. The importance of interdisciplinary scholarship requires new methods of keeping current, as many researchers are challenged by the variety of protocols for searching digital indexes and databases outside of their core disciplines. Archival research also presents challenges to discovery, as many archival institutions—foreign or domestic, public or private—do not fully represent their holdings in online catalogs, or do not conform to standards that allow easy discovery and access. At the same time, the growth of digital archives demands new methods for successful discovery and use.

“Gather” distinguishes searching activities from the acquisition and organization of resources, no matter how diverse. Given the wide array of material used by scholars in a single project or over the course of a career, these materials range from books and articles, electronic resources, film, sound recordings, artifacts, data sets, ephemera, maps, and more. Processes of acquiring research materials physically or electronically, and storing them physically or electronically (or both) lead many researchers to question their own methods and best practices. The idiosyncratic character of organizational strategies and systems (even for a single researcher), and the proliferating media that researchers deal with on a regular basis, create what researchers consider a “breaking point”: their offices (at home and on campus), shelves, storage closets, basements, hard drives, and floppy discs, zip drives, and CDs are all full, disorganized, and messy.

“Create” refers to the kinds of activities scholars undertake once they have identified and acquired resources for their research: analyzing and synthesizing materials, information, and ideas; annotating research materials; writing; working collaboratively; preparing grant applications and teaching materials; and reviewing and rating resources for scholarly use.

Behaviors attendant to “Share” include all aspects of dissemination: participating in conferences and scholarly meetings; publishing; teaching; sharing data, ideas, resources, drafts, and completed works. Issues of intellectual property and copyright are especially important, as well as all activities scholars undertake while preparing reports, theses, presentations and manuscripts: identifying high impact journals, conferences, and publishers, and all the protocols and procedures for successfully disseminating one’s work.

### **A. Discover Data Analysis**

- As a result of the highly interdisciplinary nature of faculty and graduate students’ work (more than 90% of faculty consider their work interdisciplinary), as well as the diverse types of materials and media they

- consult, scholars need better methods of addressing the specificity and uniqueness of their research topics and keeping up their fields.
- Faculty and graduate students are very comfortable with electronic sources for their research (from articles to artifacts) and with electronic forms of communication (email). Despite humanities and social science scholars' dependence on electronic resources and tools, they are not always accomplished technologically. Successful technological innovations that address discovery (as well as gathering, creating, and sharing) must be easy to adopt, and should fit well with established practices and habits. At the same time, though faculty and graduate students report a need for assistance in a variety of areas of research (from bibliographic work to dissemination), many are slow to seek assistance. There is a need for services and tools that find the researcher, not the other way around.
  - Archival research is one of the top three research methodologies employed (after textual analysis and historiography). Archival research, increasingly important among scholars across disciplines, is particularly challenging due to the idiosyncratic organization of archives and the range and variety of materials housed within them, as well as the proliferation of digital archives that are not always captured in traditional search engines.
  - Nearly 80% of faculty consider browsing shelves at the Library to be extremely or somewhat important. Although 75% of faculty report that they browse Library stacks only monthly or occasionally, this does not necessarily mean that browsing stacks is less important than faculty say it is, but that activities like browsing take place at key stages of research.
  - Graduate students report a pronounced need for training in research practices, especially in the areas of archival research methodologies and grant funding opportunities and procedures. A lack of general knowledge about the many resources on campus available to graduate students suggests that the Libraries are in a position to make those resources more accessible and visible.
  - Graduate students (and many faculty) report that their research methods are less than systematic and more "trial and error." Researchers would benefit from new ways to organize and plan their research projects generally, and the stages of research, specifically.

## **B. Gather Data Analysis**

- Humanities and Social Science researchers have been slow to embrace electronic or web-based programs for managing citations (e.g. End Note, Refworks) and prefer word processing methods (although there is greater adoption of citation management software among social scientists). Faculty are aware that they need innovative ways to manage their research collections. A few engage in scanning activities, but methods are generally haphazard, idiosyncratic, and dependent on word processing-based lists.



- There is compelling evidence that improved strategies for organizing and storing personal research materials are desired. Because scholars also report that they have come to trust the longevity of online resources more than that of their own computer desktops, there is an opportunity to extend personal organization to networked, shared storage.
- The small and idiosyncratic collections of unique research materials amassed by faculty (and some graduate students) pose special challenges to traditional collecting, cataloguing, and digitization practices. Many of the contents of such collections have complex or unclear copyright status, and in general, the contents are organized according to logic that only the researcher understands. At the same time, these collections represent potentially valuable contributions to scholarly research and fields, and their inaccessibility is a problem that needs to be addressed in some form, either through small digitization efforts, or through an online collecting tool that can be used for public display or sharing.

### **C. Create Data Analysis**

- Improved support for interdisciplinary and collaborative research is an institution-wide interest. The University Libraries may be uniquely positioned to address those needs in sustainable and shareable ways. A goal is to bring the expertise of the Library into a broad web-based research environment in a user-centered, personal way that prioritizes flexibility, customization, and familiarity.
- The challenges of collaborative research—lack of time, money, and space, as well as inefficient and inadequate methods of sharing research materials and drafts—are many. Partnerships between the Libraries and the College of Liberal Arts, including this project, may be a model for how to address some of these challenges.
- The similarities across disciplinary lines, as well as the high amount of collaborative research that involves scholars from multiple institutions, suggest that digital tools and services to assist with collaborative and interdisciplinary research at the University of Minnesota can be extended organically to other institutions, with partners from other institutions drawing on resources at the University of Minnesota.
- Graduate students would benefit from a stable physical space within the Libraries where they can work collaborative and individually.

### **D. Share Data Analysis**

- Scholars depend on traditional venues for publishing and dissemination: journals, books, and conferences and professional meetings.
- Graduate students could use assistance with publishing at all stages, including identifying possible venues and information about protocol.

- The small number of researchers in the humanities and social sciences who use websites to share and/or display their work suggests that individuals are not apt to develop the skills or dedicate the time to building personalized websites. However, the high degree of dependence on the Internet for discovery purposes, and the general need for better methods of sharing, storing, and saving digital assets, suggest that there is potential for the development of online research environments for collaborative use.

## **PROGRAM AND PROTOTYPE DEVELOPMENT**

As we worked with the concept of primitives, we sought to understand the findings of our research as examples of common behaviors that can be modeled in a number of different contexts. At the same time, an individual's characteristics, discipline, and habits, were shown by our data to be an important consideration for how a researcher works and what he or she does. By thinking about shared tasks, we have conceptualized an online research environment that is both personal and customizable at the same time that it provides an overarching framework for the full continuum of research practices and activities. In short, there is a need for a coherent suite of discovery resources and tools, as well as a need for new tools that assist with interdisciplinary searching and archival research needs. There is also a need for innovative methods for research collaboration and the general sharing of ideas and resources.

### ***I. Areas of Program Development***

Our actions during the final phase of the planning project were focused on three main areas of program and prototype development: Library space, research methodologies tutorial for graduate students, and online research communities for scholars.

#### **A. Library Space**

In order to address needs of graduate students for stable working space for research, and the general need for innovative collaborative working spaces, we are developing plans to renovate spaces in Wilson Library for graduate student use and for faculty seminars and research meetings.

#### **B. Research Methodologies Tutorial for Graduate Students**

When it comes to doing research, most graduate students at the University of Minnesota say their best method is "trial and error." Most have no consistent training in research methodologies, and many do not know whom to ask for help. Graduate students report needing new ways to develop the advanced skills necessary for their research. Over 90% of graduate students say they need assistance acquiring and managing sources for their research.

In response, the University Libraries are exploring a library and archival research methodologies curriculum designed to meet the needs of these graduate students. "A Library and Archival Research Practicum for Graduate Students" would ultimately take the form of an online learning environment, supplemented with workshops and lectures. It is envisioned as an interactive and modular curriculum that facilitates skill development in graduate education and research. This curriculum would be customizable according to graduate students' disciplinary and interdisciplinary needs and would be adaptable for a variety of audiences, from departments offering research methods courses to individual graduate students seeking support. Further, it is conceived to be shareable, used

beyond the University of Minnesota as a model of innovative research assistance and expertise.

The goal of the curriculum would be to provide graduate students with the knowledge and experience needed to conduct effective and thorough literature reviews of their own research areas as well as research across disciplinary lines. They would be better equipped to successfully navigate the vast digital and archival resources within and outside their areas of specialization. They would also gain the knowledge management and collaborative research skills crucial to being productive future faculty scholars.

Data from the study reveal the need for assistance and training in the full range of advanced research activities. There is a critical need for advanced training in three major areas of research methods: advanced subject searching, citation and resource management, and archival research and protocols. Additionally:

- 70% of graduate students report that they would use assistance preparing bibliographies.
- 50% of graduate students surveyed claim that their methods of keeping up with their fields of interest are only somewhat effective or not very effective.
- The majority of graduate students perform interdisciplinary research (over 90%).

In order to respond effectively to graduate-level research needs, a proposed practicum in advanced research methodologies would include the writing of a research methodology statement; advanced searching of databases, archives and special collections (digital and traditional); identifying and manipulating relevant interdisciplinary resources; citation and resource management; and archival research and protocols. Other potential topics include: how to obtain funding for research, how to use research time effectively when researching abroad, and how to disseminate and present their research. The curriculum also seeks to increase graduate student awareness and use of the many resources available on campus that relate to research training and expertise. This includes increasing the visibility of workshops offered by the Graduate School in grant-writing and other issues of professionalization; international funding and resources from the Office of International Programs; teaching support and technology workshops offered by the Center for Teaching and Learning Services (CTL) or Academic and Distributed Computing Services (ADCS); and workshops offered by the University Libraries.

A proposed “Library and Archival Research Practicum” would be available online for use or adaptation by individual departments, reference and subject librarians assisting graduate students, and all graduate students in the form of a self-paced tutorial. Possible approaches include:

- As customized online content offered in collaboration with other departments for departmental research methods courses and available through the WebCT/Vista technology platform
- As a continuously available online course offered through the College of Continuing Education and academic departments
- As an independent, self-paced online tutorial for graduate students supported and managed by the University Libraries
- As a non-credit/certificate program in “Advanced Research” available as an online tutorial supported and managed by the University Libraries

Presently, project and Libraries staff from the departments of Archives and Special Collections and Humanities and Social Sciences are continuing to develop curricular content for a research methodologies tutorial. We are exploring two partnerships with humanities departments that will allow the University Libraries to determine staffing and content development needs for a sustained online tutorial in research methods for graduate students in the College of Liberal Arts.

### **C. Online Research Communities for Scholars: Scholar’s Collective**

In response to the assessment data of the 16 departments studied over the past year, the project team worked on the development of a prototype research and information environment that is customizable according to discipline and academic status (graduate student, faculty), deeply collaborative, and rich with opportunities for end-user contribution and sharing.

By noting key challenges facing scholars, we attempted to identify possible solutions that would address scholars’ primary needs, as well as move a scholar’s work—or a field—forward. Discipline-specific virtual research communities would incorporate a rich combination of content, tools, and services, bringing together the building blocks of successful research. As a one-stop environment tailored to personal research habits, it would be possible to discover resources in multiple fields, organize a project, analyze and synthesize materials, and share results. Key tasks to be addressed, include (but are not limited to):

- Finding/Identifying materials: creating improved ways to address the obscurity/specificity of research topics, the lack of obvious sources, and the need for archival materials
- Making acquisition of desired content easier
- Keeping up with field(s)
- Organizing resources and materials
- Collaboration: bridging the distance between scholars, virtual salon for collaborative research, communication tools, file sharing, etc.

This prototype work began in January 2006 with programmers and staff from the University Libraries Digital Library Development Lab (<http://www.lib.umn.edu/digilab/>). Director John Butler, Web Applications Developer Paul Bramscher, and Webmaster Shane Nackerud were key to these efforts. Cecily Marcus and Kate McCready also participated in this work. Eric Celeste, Associate University Librarian for Information Technology served as a general consultant.

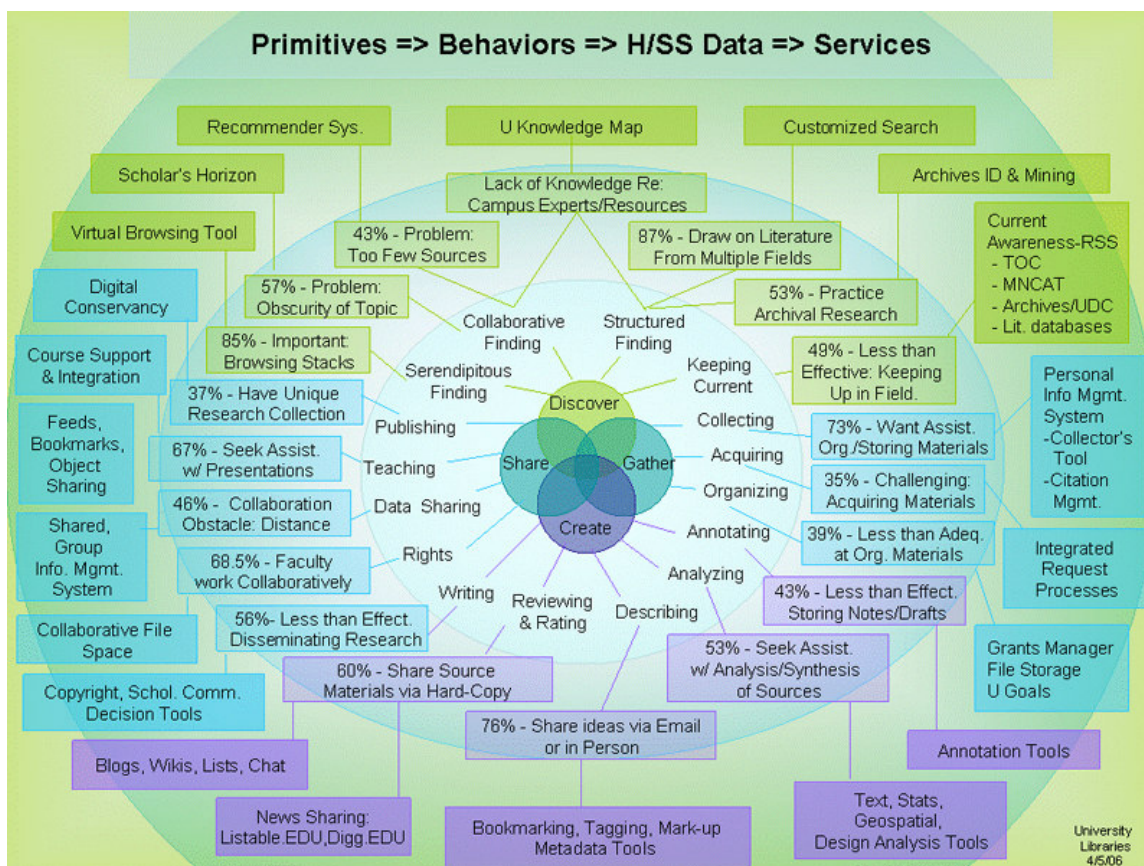
## ***II. Prototype Process***

### **A. January-February 2006: Description, Deliverables**

January and February focused on the initial description of the proposed web environment (task-based analyses and data support), to articulate deliverables. This was an expansive process in which we identified key challenges facing researchers (metasearching for interdisciplinary research, keeping up with field/s, archival research methods, discovery of campus resources, collaborative research, and personal resource organization and public accessibility, among others) and identified existing or needed tools that could assist with a given challenge.

In addition, we identified software development needs and their potential organizational home domains (within the University Libraries or the University of Minnesota Office of Information Technology, for example), researched possible challenges (authorization, privacy, and other technological concerns) of development and implementation, and refined software and working requirements for each proposed tool or service. In order to keep track of a burgeoning list of tools and services, we prepared a working spreadsheet in which we recorded a brief description of the proposed tool, the tasks it addressed, and the primitives to which the tool referred. Additionally, we noted our assessment of the tool's priority among users, and described development needs, component parts, stewardship of components on campus, as well as feasibility issues and potential challenges. When appropriate, we also listed current status of development.

At this stage of prototype development, we worked as expansively as possible so as not to restrict any possibilities before thorough feasibility research had been completed. We aimed for breadth as well as depth, while maintaining focused attention on the goal of addressing individual and discipline-specific needs. At the same time, we worked with an eye towards architectural openness and component flexibility that that would allow a model like this to be applicable in other scholarly realms—in the sciences and at other institutions. One result of these efforts was an extensive graphic that attempted to track relationships between a) primitives, b) common tasks, c) support from data, and d) potential tools and services that would address scholars' needs.



As an abstract representation of scholarly processes rather than a distinct project, we were able to visualize the connections between research activities and begin to determine the overlapping architectural requirements of various tools. The diagram, and our planning, flows from primitives to behaviors, to data about the behaviors, and finally to potential services. The graphic display also allowed us to begin to determine development priorities within the scope of options.

Because we were conscious of the deep collaboration necessary for successful development and implementation—partnerships within the University Libraries, at the University of Minnesota, and beyond—the project team also identified key Library staff to serve as an advisory group for the prototype development process and future implementation plans. Three librarians with distinct specializations were convened to discuss disciplinary needs within the areas they serve, as well as the role of librarians in implementing future research environments.

**B. March-April 2006: Refinement and Presentation**

Once we had identified a range of possible tools and services to address the primary challenges confronted by researchers, we worked to refine the proposed tools and identify initial priorities for further development. In addition, Shane Nackerud created a test interface that moved our theoretical model of an online

research environment into a template for presentation and discussion. We shared initial prototype plans with various communities, including the College of Liberal Arts Office of Information Technology and its Research staff, the University Libraries Cabinet, the Senate Library Committee, and the Academic Programs staff of the University Libraries.

**C. April-May 2006: Specification, Faculty and Graduate Feedback, External Consultation**

In order to gather useful feedback from potential users that would allow us to shape the environment most effectively and address stated user needs, we held five roundtable lunches with faculty and graduate students. Participants included but were not limited to researchers who had spoken with us in interviews and roundtables during the assessment phase of the project. A total of 27 graduate students and faculty members met with us for a presentation of the prototype interface, then tentatively called *My Field* (now proposed as *Scholar's Collective*), to discuss general reactions, specific priorities, and usefulness of proposed tools.<sup>9</sup> Participants were asked to fill out a reaction sheet that ranked usefulness of tools, potential method of use (private, shared, work in progress, etc.), importance of features (ease of use, privacy, usable for multiple projects, etc.), and provided space to comment on disciplinary needs and other general comments.

Feedback sessions with faculty and graduate students were enormously productive, as our prototype plans were met with great enthusiasm. We also collected valuable and specific feedback that shaped our thinking about the future direction and priorities of an online research environment. Among the priorities ranked by researchers as most important were:

<b>Most Important</b>	<b>Very Important</b>	<b>Important</b>	<b>Less Important</b>
E-journal access	Archival research support	Goals/task engine	Graphic display of research
Annotation tools	Metasearch/multiple index searching	Communication tools	Analysis tools
Collecting tools	Email delivery Table of Contents		Copyright assistance
	Recommendations		
	Tagging capability		
	Refworks access		
	Saved bookmarks		

<sup>9</sup> For a presentation of the *My Field* prototype interface, see: <http://www.lib.umn.edu/about/mellon/docs.phtml>



From this feedback and subsequent discussions among the project programming staff, we identified two main components for future development:<sup>10</sup>

- Gathering Tool
- Social Networking/Tagging for scholarly environments

In order to address fully the complexity of these tools, we opened our discussions to include specialists in the fields of digital libraries, scholarly communications, and social networking trends to discuss some of the tools and services identified during the prototype phase of this grant. In May, 2006, we convened a “Design Event” to bring together external and internal consultants. Those in attendance for the one-day session were Jeremy Frumkin, the Gray Chair for Innovative Library Services at Oregon State University, Susan Gibbons, Associate Dean for Public Services and Collection Development at the University of Rochester Libraries, and Roy Tennant, User Services Architect at California Digital Library. Matt Nutall, from CLA OIT Research Services division, and Chad Fennel, web services librarian for Health Sciences, also participated.

The purpose of the Design Review Event was to discuss the challenges—from general design principles to architectural underpinnings—of the development priorities we have identified in the course of prototype development. The focus of the day was:

- U of M’s project assessment data, prototype development process, priorities, and functional goals
- Social computing for scholars and community intelligence tools requirements
- Extra-institutional interoperability, identity and authorization challenges
- Component-based tools and flexibility of assembly
- Low barrier tools and user uptake; hybridization with formal tools and systems
- Personal information management: beyond bibliographic data

During the Design Review Event, much of the discussion was focused on the “Gathering Tool” as the central component for new development, a tool that allows researchers to collect digital objects, store them for future and multiple uses, share them, and tag them with useful labels for future retrieval. Tagging, and the social networking potential for building rich information environments centered on scholarly research, is a crucial element of this tool.<sup>11</sup>

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<sup>10</sup> For a full description of prototype feedback, see Appendix 5.

<sup>11</sup> For Design Event participants, agenda, and summary of discussion, see Appendix 6.

### ***III. Fieldnotes from the Humanities: A Scholar's Collective for Individual and Collaborative Use***

During prototype feedback sessions with faculty and graduate students, and based on feedback from the Design Review Event, certain areas of development have emerged as top priority needs. These priorities reflect both areas where there is an absence of tools or services, as well as areas where scholars lack the knowledge or expertise for discovery, gathering, and sharing:

- A “Gathering Tool” – an integrated online tool to gather, arrange, organize, store, and share objects (images, documents, audio, video, bookmarks, etc.) for scholarly research needs.
- Archival research information and tools to assist scholars in finding appropriate archival collections and learning more about accessing them.
- Current awareness tools to provide better access to e-journals, table of contents alert functionality, and RSS/subscription feeds.
- Improved tools that allow scholars to find appropriate research resources (e.g., re-designed “One Search” for multiple database searching), share resources with peers, and evaluate materials cooperatively in a discipline-based environment.

As a result of the prototype development process, three themes have emerged as central to the technology development for the virtual environment, specifically: component flexibility and customization, architectural interoperability, and social networking in the scholarly community.

#### **A. Component Flexibility and Customization**

Though the development of scholarly “primitives” allowed us to identify core tasks common to research regardless of specialization, data also suggest that discipline-specific content and tools are valuable to researchers. Therefore, an online research environment for scholars is predicated on the assumption that more than a generic context for research is desirable. In order to best capture the iterative nature of the research process, we hope to develop a component-based environment that is customizable (based on authorization information such as rank and department) according to an individual's field of specialization. With customized, discipline-specific content and tools “pushed” out (relevant to Anthropology, for example), the user would be able to pick and choose among resources and remove any from view that he or she considers to be less useful. Thus, the components are autonomous and flexible, allowing the user to participate in shaping his or her own environment. At the same time, the built-in architectural interoperability of the system also allows pieces of the environment to be adopted by other institutions according to their own needs.

## **B. Architectural Interoperability**

As a result of the unbounded nature of how scholars work, the resources they use, and the colleagues with whom they collaborate, a successful online research environment cannot be limited to a single interface, or even single institution. One fundamental principle of our prototype is sharing—the formal and informal passing of information and materials, ideas, and knowledge in which scholars regularly and often casually engage. Therefore, we hope to build an online virtual research web environment that is extensible to other institutional settings.

The project data suggest that object management tends to take place in a single-user environment (the researcher's own computer). The ability to share networked files is facilitated (theoretically) by collaborators owning accounts on the same network drive or space. But cross-institutionally or global sharing, group and rights management -- among users not on the same network -- seems to up the ante from operating system to an application-level problem. Building additional facilities over the TCP/IP/HTTP/HTTPS protocols may offer an opportunity to build a low-barrier and universally shareable described collection bin.

A tool to organize and "gather" resources is envisioned for scholars to collect/organize/store files from various sources on the Internet. The tool, and the proposed environment in general, would not be limited to the University of Minnesota user domain. Ideally, such a system would allow its users to create additional ad hoc accounts for distant colleagues, professors emeriti, or collaborators in industry.

## **C. Social Networking in the Scholarly Community**

A key component of the overall environment is the use of folksonomic tagging to help scholars individually organize their materials and also benefit from the tagging and annotation efforts of the larger community. Tagging, user-generated categories and metadata, has proven quite successful in other online environments such as <http://del.icio.us/> and <http://www.flickr.com/> as an innovative method of organization and sharing. Tagging leverages user-based knowledge and expertise to contribute to a rich, content-filled environment, and to connect individuals interested in similar subjects. Tagging has already begun to make appearances in scholarly settings such as Connotea, an online research site for scientists, and CiteULink, a scholarly website for social bookmarking. Tagging therefore provides us with an excellent opportunity to investigate the feasibility and efficacy of using folksonomic principles in a library/academic environment. It is our intention to expand the "tagging" paradigm to work more effectively in an academic environment by extending it through options such as faceted tagging, or investigating the possibility of combining folksonomic tagging with more traditional library controlled vocabularies, such as Library of Congress subject headings.

## **A PROPOSED SCHOLAR'S COLLECTIVE**

Keeping in mind the three development principles of component flexibility and customization, architectural interoperability, and social networking, we seek to build a component-based architecture that enables users and their scholarly communities to participate in the creation of their own information environment. This collective intelligence approach would lean heavily on strategies of user contribution, social networking, and collaborative filtering to build rich information environments around communities of interest. Users would be able to customize components on an individual and discipline/subject basis. While these tools could be combined in a “monolithic” site, it is our hope to build these tools to be highly customizable and modular (i.e., ability to add and subtract) according to a scholar's research needs. The tools should be flexible enough to be integrated into existing scholarly workflow patterns, and provide users with a dynamic integration between services they currently use and new services offered through this environment. Further, since many scholars work collaboratively with colleagues outside of their home disciplines, departments, and universities, it is important to build tools that are not tied to any specific interface or presentation, thus giving them the potential to function globally and in combination with a scholar's local services.

Of the tools identified as highly desirable by researchers and experts in the fields of scholarly communication, digital libraries, and research development, the notion of a “Gathering Tool” emerges as the centerpiece. Going beyond online file storage, the Gathering Tool would require the most development effort. Envisioned is a low-barrier Flickr-type scholarly object collection tool that works in tandem with other tools in the environment, allowing the seamless gathering, storage, and sharing of materials. By using the Gathering Tool, scholars will not only collect materials for their own use, but will also participate in creating a multi-dimensional information environment that offers materials to other scholars with shared interests. At the same time, scholars would be able to choose to keep their collections and research private, but the tool would also allow for project-based work and the sharing of specific materials at the discretion of the scholar(s). As more than a mere storage and organization tool, the Gathering Tool also functions to help scholars create scholarly output by providing assistance in organizing and arranging specific objects for a dissertation, a grant, a thesis, a scholarly article, or any other project they might be working on.

At a technological level, there is a need for better methods of file storage and retrieval that also address organizational and sharing needs. Tagging, the activity of naming discrete items with shared labels, is a ubiquitous organization practice, though it is rarely called tagging in scholarly circles. But the idiosyncratic nature of researchers' organization methods, and the usefulness of tagging in non-scholarly environments for connecting individuals with others with shared interest, suggests that tagging may be useful paradigm to consider when thinking about collaborative research. With online file storage that supports the variety of media used by researchers, and with tagging as an organizational structure,

collaborative research (both extra- and intra-institutional), could be moved online for sustained and productive communication and sharing needs.

Key challenges for the development of this entire environment include maintaining principles and standards of privacy for our users, abiding by legal and accepted practices regarding intellectual property and copyright, establishing a suitable authorization scheme that meets the needs of various levels of “sharing” required by scholars, maintaining provenance and citation information necessary for responsible scholarship in a low-barrier collection and tagging workflow, discovering the feasibility of sharing these tools *and* services beyond the University of Minnesota (especially authentication issues), and building the critical mass necessary for a suite of tools critically shaped by user contributions.

## **DISSEMINATION AND FUTURE PROJECTS**

### ***I. A Model Project***

“A Multi-Dimensional Framework for Academic Support” was originally conceived of as a model of assessment, analysis, and response that would be extensible to other disciplinary and institutional contexts. As a result of many substantive conversations and working sessions with Libraries staff, the Office of Information Technology, and other university stakeholders, we are confident that we have developed an effective assessment methodology that can be adapted for new populations of scholars and researchers. Preliminary discussions and plans with the University Libraries Sciences and Health Sciences Libraries staff are already underway about how to best capture the research habits of professors and clinicians working the fields of medicine and science.

Similarly, our broad discussions of the prototype process with Libraries staff and external consultants allow us to consider how to extend a scholar’s collective beyond the College of Liberal Arts.

### ***II. Dissemination***

We have had many opportunities to speak with audiences about “A Multi-Dimensional Framework for Academic Support.” Wendy Lougee presented on the early stages of the study at the 2005 CIC Space Planning Conference, and referenced the project in a recent article, “Libraries: Diffuse and In the Flow,” in *CLIR Issues* (May/June 2006). Karen Williams presented on the project at the 2005 Charleston Conference. Kate McCready recently spoke at the 2006 JSTOR Publisher’s Conference, and Kate McCready and Cecily Marcus have spoken to many audiences within and outside of the University of Minnesota, including the 2006 Academic and Research Libraries Division Day. Kate McCready is representing the project in a poster session at the 2006 American Library Association Annual Conference.

The final report for the project will be posted on the project website.

## **CONCLUSION: CREATING A SCHOLAR'S COLLECTIVE**

The University of Minnesota Libraries' 2005 exploration of research infrastructure and behavior explored the full spectrum of resources that support contemporary research in the humanities and social sciences.

While the assessment techniques were not sufficiently detailed to create fine distinctions between disciplines, general characteristics of discipline communities were captured. Thematic analysis of the interview and survey data suggested particular stressors for those scholars engaged in qualitative research, primarily (though not entirely) in the humanities. This community can be characterized as:

- Employing multiple research methodologies (e.g., text analysis, historiography, archival research) that were developed largely in a print context and are not easily migrated to a digital context.
- Comfortable with electronic content and possessing an appetite for even greater access to digital content, particularly content that currently only exists in print or analog form.
- Challenged by obscurity of research topics and difficulty in securing resources, particularly given the often unique nature of the material.
- Significantly engaged in interdisciplinary research, but challenged to keep up with the literature in the primary field, much less other disciplines.
- Reliant on extensive, accumulated research materials (notes, photocopies, personally developed lists/indexes) and idiosyncratic strategies to manage those resources.
- Challenged to manage personal collections of both print and digital resources.
- Engaged with colleagues at other institutions, though challenged to collaborate by distance and ineffective mechanisms for collaboration.

Scholars in our study shared a picture of their environment in which dual (paper and digital) practices abound, and disorder is the norm. For example, Professor "A" described his work environment as including piles and piles, drawers and drawers of photocopies of downloaded or copied articles and other materials. Printouts are used for annotation. His summer pledges to clean up and organize archived pdf files by titles on his hard drive have been unrealized. His personal research collection includes 50,000 slides plus digital photographs, variously organized, named, filed, and maintained. Professor "A" is not atypical.

The University Libraries and College of Liberal Arts (CLA) plan to build on the rich descriptive data that have been gathered in this exploratory process. We propose to develop a program that targets humanities and allied disciplines, developing research infrastructure that enables collaboration, enhances graduate student experience, and explores the policy dimensions of open research environments on a potentially global scale.

While significant progress has been made in digital library content and tools to enhance retrieval of content, far less attention has been paid to aiding the scholar's research processes. The ACLS report on Cyberinfrastructure for humanities and social sciences noted that "despite all evidence that 'the future is digital,' we have relatively few digital communities, and relatively few platforms for online collaboration. In addition, individuals continue to dominate in a new medium that invites and enables collaboration. Lone scholars...are working in relative isolation building their own content and tools, struggling with their own intellectual property issues, creating their own archiving nightmares."<sup>12</sup> The ACLS report further challenges the community to create new knowledge organizing tools and nurture digital literacy among current and future scholars.

Our proposed Scholar's Collective would address the dual challenge of creating useful tools for humanities scholarship, while simultaneously creating capacity for collaboration. The methodology we recommend would focus on creating incentives for adoption of these new tools through graduate student – faculty research partnerships.

The scope of the Scholar's Collective addresses two significant cultural shifts in humanities scholarship. The first is the research practices of scholars who depend on electronic media and tools for individual and collaborative work but whose research methods have not yet successfully incorporated techniques to manage a hybrid information environment. The second is the increasingly social dimension of new online environments. By building a comprehensive research environment for humanists that leverages scholars' expertise and specialized knowledge *and* that offers personalized and customized resources and support for individual and collaborative research, we hope to build on our work in "A Multi-Dimensional Framework for Academic Support" and forge a new model of collective scholarship in the humanities and allied disciplines.

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<sup>12</sup> The Draft Report of the American Council on Learned Societies Commission on Cyberinfrastructure for Humanities and Social Sciences, November 5, 2005. <http://www.acls.org/cyberinfrastructure/acls-ci-public.pdf>