

# Deep Blue: A Usability Assessment

## Assignment #5 Survey

by

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February 23, 2006

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SI 622

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## **1. EXECUTIVE SUMMARY**

Deep Blue provides faculty, staff and students a means of permanently depositing their professional and academic work as members of the University of Michigan scholarly community. As part of SI 622, the group conducted a web survey on Deep Blue's behalf. The primary purpose of the survey was to gather information on how faculty currently store their digital documents and how they view digital repositories. To gain participants for the web survey, the group recruited faculty responses through departmental email lists obtained from the University directory. The survey received 36 total responses, of which only 33 were deemed valid. Those responses and the subsequent statistical analysis documented that:

- Few of the respondents are presently using a digital repository
- Numerous respondents use and wish to store multiple file types
- Respondents have many digital documents and are willing to upload them
- There is demand for datasets to be stored within a repository
- Presently, most respondents store their documents on their computer
- Several respondents indicated they wish to have an institutional repository
- Many respondents have not heard of Deep Blue
- There are multiple factors that make people hesitant to store items in a digital repository

These findings suggest that there is a need and desire for a service like Deep Blue in the academic community. However, Deep Blue implementers must address perceptions regarding the persistence of the service and educate the community on the nature of digital repositories.

## **2. SURVEY OVERVIEW**

### **2.1. Overview of Deep Blue**

Deep Blue is a digital repository designed to serve the University of Michigan's scholarly community in preserving its intellectual work. This initiative provides a long-term means for university students, professors, and staff to store their finished articles, unpublished works, and related datasets.

The project began in August 2004, with the adoption of D-Space, an open-source digital repository software jointly developed by the Massachusetts Institute of Technology and Hewlett Packard. Deep Blue is the University of Michigan's implementation of DSpace.

Each DSpace service is comprised of communities – groups that contribute content to DSpace – and each community in turn has collections, containing the content items, or files.

Currently, there is only one community – University of Michigan. This community has two collections: College of Engineering and University of Michigan Transportation

Research Institute (UMTRI). However, Deep Blue hopes to unveil its service to the greater university through a widespread marketing campaign later this year. Presently, the Deep Blue staff is conducting presentation sessions to select university departments in order to foster interest and to broaden its collection base. In addition to these efforts, approximately a dozen collections are ready for public use and dissemination in spring 2006.

Deep Blue allows its users to conduct a number of tasks including depositing items; searching; browsing communities and collections, titles, authors and by date; editing profiles; and subscribing to email notifications for collection updates. In order to deposit a document, edit profile or subscribe to email notifications, users must log in to the system. Users are authenticated using the Kerberos login process common to the majority of University of Michigan web-based applications.

Deep Blue is committed to ensuring the lasting preservation of the scholarly and artistic work done at the university by encouraging formats technologies that will enable reliable data migration and future format upgrades for a variety of systems and platforms.

## **2.2. Target Audience**

Although Deep Blue is provided to the faculty, staff and students as part of the University of Michigan scholarly community, its main target audience is the faculty, as they do most of the academic research. Staff members and students might also deposit items into Deep Blue on a limited basis. Staff members are not copyright owners; and it is uncommon for students to deposit items, since the rules regulating copyrights of academic research done by students are stricter.

## **2.3. Purpose**

Deep Blue relies on faculty as its primary content supplier and potentially as a significant consumer of the deposited works. However, the scope of faculty interest and range of material remains unknown. Therefore, the primary purpose of the survey was to gather information on how faculty currently store their digital documents, their awareness of Deep Blue, and their views on digital repositories. Initially, the survey deployment was limited to strictly faculty (i.e., the Target Audience), but the survey was eventually opened to PhD students at the School of Information in order to get a larger sample size and assess the interest of future scholars.

## **2.4. Methodology**

For this survey, the group selected the Survey Monkey website as the means for creation and deployment (<http://www.surveymonkey.com>). Our choice was made for the following reasons:

- Ease of creation
- Variety of question and answer types within Survey Monkey's catalog
- Ability to export to Microsoft Excel for data analysis

- Minimal financial cost
- Maximum accessibility; the survey link only requires a web connection
- Ability to randomly order possible responses to avoid bias towards those at the top

A printed copy of the deployed survey is available in Appendix A.

To recruit participants for the web survey, the group attempted to connect directly with faculty using departmental email lists from the University directory. The group contacted the owners of the specific faculty lists (typically, departmental administrative assistants) to seek permission to use the lists. Although, the group could have simply emailed faculty lists directly, such an approach would have generated ill will towards the group and class instructor as well soured initial impressions of Deep Blue.

The recognized need to request faculty lists created a problem in two respects. First, email list owners rarely replied to the group's initial request for assistance. Second and assuming the group received a favorable response, it remained difficult to obtain permission(s) from administrative assistants and deans in a timely manner. Ultimately, we received clearance to use the faculty lists for the School of Information and the College of Engineering and the doctoral students list at the School of Information. The survey was up for approximately one week after it was sent to the last group. The difficulty with email and online surveys is that they are self-selective. Figure 1 describes the response rates we received from each of the three lists.

| List        | # Responses | # on List | Response Rate |
|-------------|-------------|-----------|---------------|
| PhD         | 8           | 39        | 20.51%        |
| SI Faculty  | 7           | 49        | 14.29%        |
| Engineering | 18          | 576       | 3.13%         |

*Figure 1. Survey Response Rates*

## 2.5. Demographics of Sample

In all, 36 people responded to the survey. For purposes of analysis, the group eliminated three respondents, one of which was out of our target audience and two of which only answered demographics. This resulted in 33 individuals consisting of:

- 23 males; 10 females
- 18 associated with Engineering; 15 with SI<sup>1</sup>
- 8 PhD Students; 19 faculty members; 6 research scientists<sup>2</sup>
- Have been at the University for varying number of years, as illustrated in Figure 2.

<sup>1</sup> Two Professors had a dual appointment and were the only members of other schools.

<sup>2</sup> For exact tenure levels, please consult Appendix ##

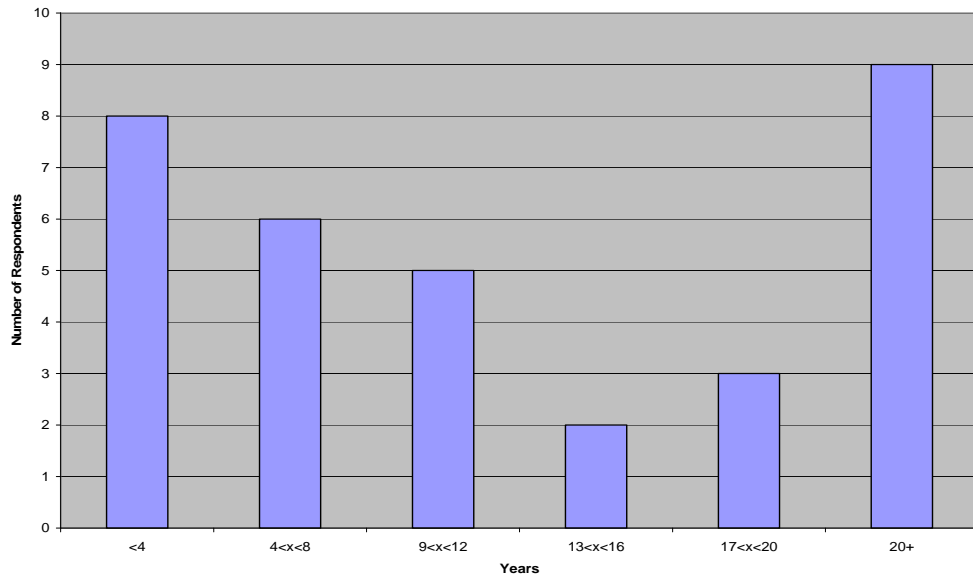


Figure 2. Respondent time at the University

### **3. DATA ANALYSIS**

The data analysis is divided into four sections. The first section evaluates the respondents’ current digital environment. Next, the sample’s view of digital repositories is explored. The third section examines the differences and similarities between the respondent’s digital environment and their perceptions of digital repositories. Finally, the fourth section addresses Deep Blue’s name recognition and any additional comments respondents entered into the survey (Question 20). A t-test was completed on most variables to determine if there were any dependencies, but no one variable (besides the Deep Blue awareness question) is dependent on age or department.

#### **3.1. Current Environment**

Respondents were asked where they store their current documents. Responses are summarized in Figure 3. The average number of places that digital documents are stored was 2.66, with most respondents using 2.

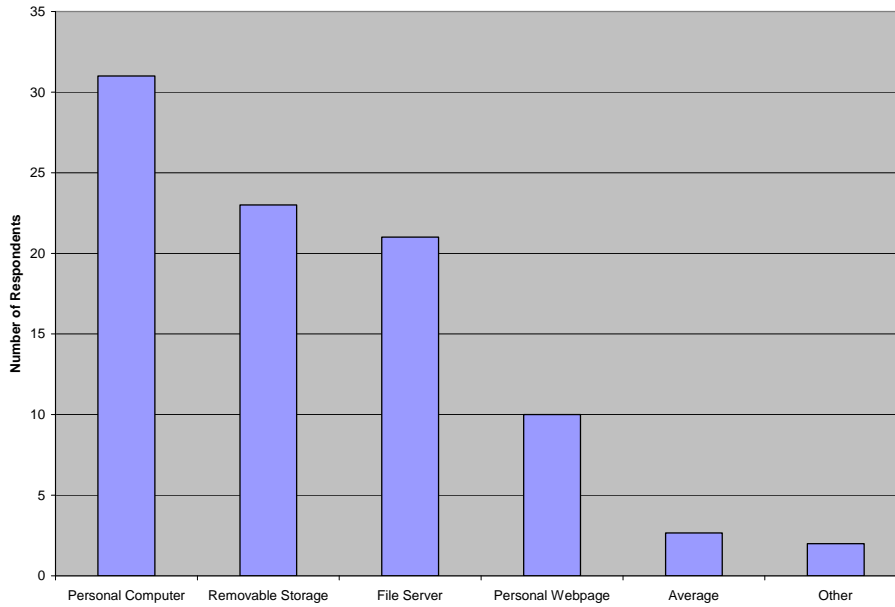


Figure 3. Current Document Storage

To assess the current number of digital documents stored by respondents, we gave people ranges from which to choose. A majority of users (57.58%) responded that they had more than 100 documents, indicating that there is a great demand for this type of service. This theory was reinforced when a large majority (87.88%) said that they are not currently using a digital repository. In addition, 9% of respondents were not sure if they were using a repository. This means that of the respondents almost 98% either do not use a digital repository or do not know if they are using a digital repository. This is a striking number considering they have over 100 documents to store. Regarding file types, a majority of respondents indicated that they have the following types of digital media: Adobe PDF, various word processor documents, presentation documents, spreadsheets, text, images and various mark-up languages. Please look at Appendix B for exact statistics.

Are you currently using a digital repository?

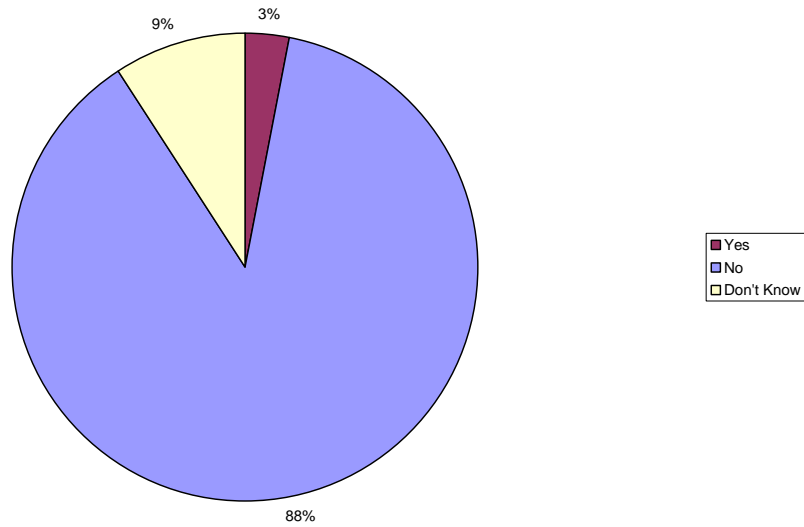


Figure 4. Current Repository Use

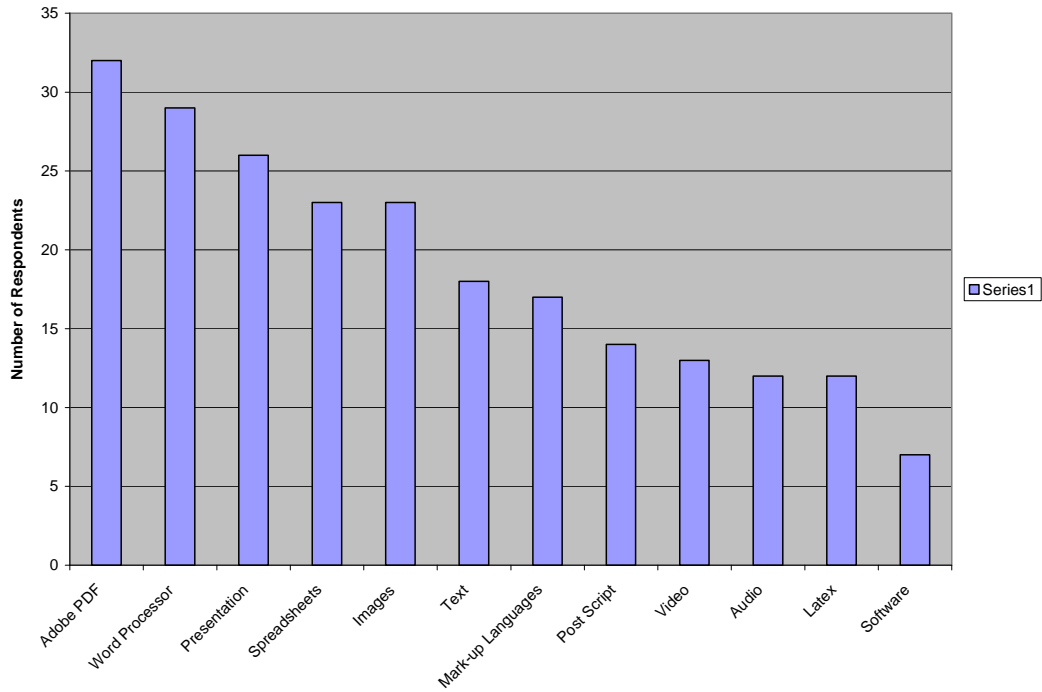


Figure 5. File Type Preference

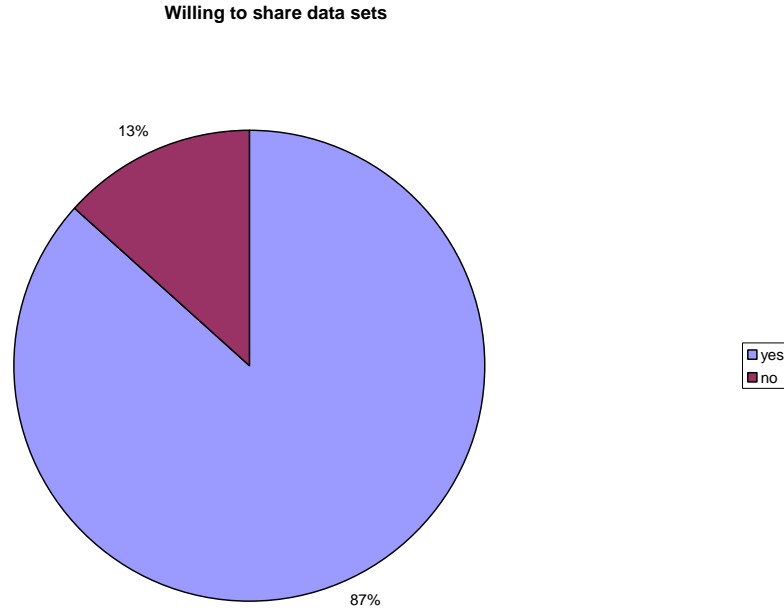
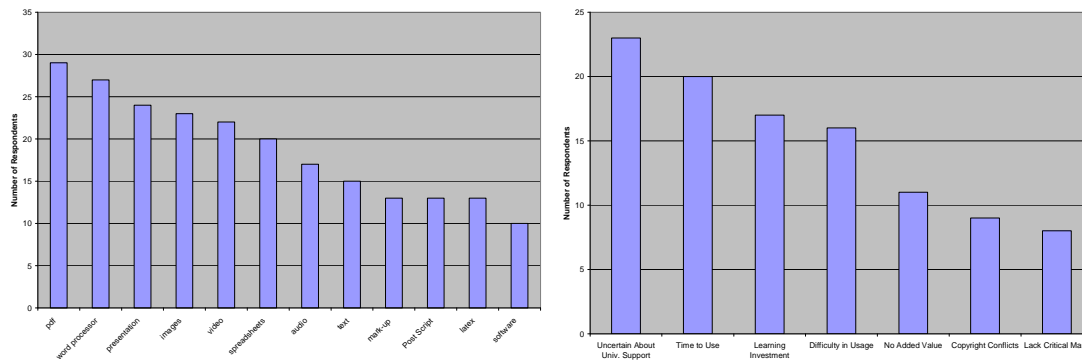


Figure 6. Willingness to Share Datasets

### 3.2. Views on Repositories

Survey responses regarding attitudes toward institutional repositories yielded some interesting results. A majority (54.55%) indicated that they preferred an institutional repository to other types of repositories. However, when asked what would make them hesitant to store documents in an institutional repository, a majority of individuals (69.70%) indicated that they were uncertain of future university support. There are many types of documents that the sample wished to be able to upload to Deep Blue. Below is a summary of document types respondents would like to be able to store in a repository:



A majority that respondents (20 of 32 respondents for 71.42% and an average of 4.66 on a 5 point scale)<sup>3</sup> indicated that support for multiple file type was important in their

<sup>3</sup> It is possible that previous questions on file formats biased this response, but it is significant).

consideration of digital repository use. Another important factor was the ability to be linked to (59% of respondents indicating important, average of 4.42 on 5 point scale).

|   | <i>Unimportant</i> | <i>Somewhat Unimportant</i> | <i>Neutral</i> | <i>Somewhat important</i> | <i>Important</i>   |
|---|--------------------|-----------------------------|----------------|---------------------------|--------------------|
| Ability to be permanently linked to                                       | 1 (3.13%)          | 0 (0.00%)                   | 1 (3.13%)      | 10 (31.25%)               | <b>16 (50.00%)</b> |
| Ability to be found using scholarly search engines                        | 3 (9.38%)          | 0 (0.00%)                   | 3 (9.38%)      | 8 (25.00%)                | <b>14 (43.75%)</b> |
| Ability to be found using internet search engines                         | 3 (9.38%)          | 0 (0.00%)                   | 7 (21.88%)     | 6 (18.75%)                | <b>13 (40.63%)</b> |
| Ability to overcome copyright concerns                                    | 0 (0.00%)          | 1 (3.13%)                   | 5 (15.63%)     | <b>12 (37.50%)</b>        | 10 (31.25%)        |
| Ability to license works (e.g. Creative Commons or contractual licensing) | 4 (12.50%)         | 1 (3.13%)                   | 7 (21.88%)     | <b>13 (40.63%)</b>        | 4 (12.50%)         |
| Ability to control access to documents at different levels                | 0 (0.00%)          | 0 (0.00%)                   | 3 (9.38%)      | 11 (34.38%)               | <b>14 (43.75%)</b> |
| Flexible metadata   | 1 (3.13%)          | 1 (3.13%)                   | 8 (25.00%)     | 11 (34.38%)               | 6 (18.75%)         |
| Support for different document formats                                    | 0 (0.00%)          | 0 (0.00%)                   | 2 (6.25%)      | 7 (21.88%)                | <b>20 (62.50%)</b> |
| Compatibility with other UM services (e.g. Mirlyn, CTools, Blue Stream)   | 3 (9.38%)          | 2 (6.25%)                   | 6 (18.75%)     | <b>12 (37.50%)</b>        | 6 (18.75%)         |

### 3.3. Comparison: Digital Environment vs. Repository Perceptions

Interesting enough, there is no correlation between the number of documents that respondents have and the number that they store. While the exact cause of this lack of correlation is difficult to be determined, a side-by-side comparison of the type of files that they have and the types of files they are willing to store indicates that the number of documents a person has does not mean that they are willing to store those documents in a digital repository. However, some respondents did request the ability to store types of files that they do not have.

### 3.4. Awareness of Deep Blue

Not many of the people taking the survey had previously heard of Deep Blue, with only 11 respondents to this question (32.26%). However, there is a strong connection between someone being associated with the School of Information and having heard of Deep Blue ( $p=.005$ ,  $e=.05$ ). Only two people at the College of Engineering had heard of Deep Blue.

When asked for comments on Deep Blue or Digital Repositories, 7 of 33 respondents took the time to enter remarks. Of those responses, 5 are listed below:

*"File format drift: will today's pdf be readable in 10 years?"*

*"I first heard of Deep Blue a few weeks ago when I stumbled across it while doing a search on MIRLYN (I think). I had not heard of it previously, so I was happily surprised to find out that this exists. My main*

*interest would be to have a dependable, permanent storage system for archiving the papers, presentations, research code, and key results (data sets, figures, images, and animations) generated by my research group.”*

*”Works in progress need to be limited to a few users. NO DATA that is in progress should be available to unauthorized users.”*

*”I write textbooks which are very popular. I feel printing them on paper is wasting precious paper made by killing nice trees. So. I like to make them available to public digitally. They can print if they want, but then they print only pages they need, and also up to 4 or 8 pages per sheet, saving paper. I like charging users who use my books on the web a small fees like \$10, 15/book. It will be excellent if such a charging mechanism is available.”*

*”Web/search accessibility and long term confidence are two very important things for me.”*

These comments reinforce the results collected in the survey. However, it brings up some interesting ideas implementers of Deep Blue might consider in the future.

#### **4. IMPLICATIONS FOR DEEP BLUE**

This survey uncovers some excellent news for Deep Blue, as they are giving their primary users exactly what they want. The results of the survey show that people are requesting storage for a variety of file types, which is exactly what DSpace allows Deep Blue to do. Further, only one respondent from a sample, which included two very technologically literate schools, is currently using a digital repository. In addition, a slight majority of respondents prefer an institutional repository. When one combines these two variables, there is an indication that there is a need and a desire among our sample for a program like Deep Blue.

There are numerous issues for the creators of Deep Blue to take into account as they launch Deep Blue to the university. Of greatest importance is the need to overcome the fact that a majority of respondents hesitate to contribute to an institutional repository for fear that the University will not support it in the future. Another thing to consider is that none of the marketing materials that have been published on Deep Blue indicate the type of documents that can be stored (i.e. conference papers, class materials, etc.). Instead, they focus on the file formats that are supported. Indicating the types of documents able to be stored might allow professors to see more value, as many indicated wanting to store different types, each helping to preserve the intellectual history of the university.

**APPENDIX A – DEEP BLUE WEB SURVEY****Survey on Digital Repositories - University of Michigan**[Exit this survey >>](#)**Welcome**

Welcome to our survey on digital repositories at the University of Michigan. The survey is to help us understand the needs and desires of current and potential users of Deep Blue - University of Michigan's digital repository.

We want to make Deep Blue a better service for you. Your participation in this survey is very important to us. Your responses to the questions will be kept anonymous and results of this study will NOT be published.

This survey is being administered for Deep Blue by a student group at the School of Information. If you have any questions or comments about this survey, you may enter them into the form at the end of the survey, or email them to Ayca Aksu Erkan at [ayca@umich.edu](mailto:ayca@umich.edu).

**Next >>**

**Survey on Digital Repositories - University of Michigan**[Exit this survey >>](#)**Information About You (Page 1 of 4)****1. Which of the following categories includes your age?**

- Under 24
- 25-34
- 35-49
- 50-64
- 65 and over
- Rather not say

**2. What is your gender?**

- Male
- Female

**3. What is your academic department? (check all that apply)**

- College of Engineering
- Department of Communication Studies
- Economics
- Gerald R. Ford School of Public Policy
- Law School
- Medical School
- Natural Resources and Environment
- Psychology Department
- Stephen M Ross School of Business
- School of Art and Design
- School of Education
- School of Information
- School of Music
- School of Nursing
- School of Social Work

**4. How many years have you been at the University of Michigan?**

- Less than 4 years
- 4-8 years
- 9-12 years
- 13-16 years
- 17-20 years
- More than 20 years

**5. Which of the following categories include your title? (check all that apply)**

- PhD Student

- PhD Candidate
- Adjunct Instructor
- Post-doc Fellow
- Visiting Professor
- Assistant Professor
- Associate Professor
- Professor
- Professor Emeritus
- Other (please specify)

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**Survey on Digital Repositories - University of Michigan**[Exit this survey >>](#)**Information About Your Current Digital Preservation (Page 2 of 4)****6. Where do you presently store your documents? (check all that apply)**

- File server (network space, AFS or MFile)
- Removable storage (thumb drive, CD, DVD, ZIP drive, Jazz drive, floppy)
- On my computer (non-network storage)
- Personal webpage
- Other (please specify)

**7. Of your documents, how many academic papers do you have stored digitally?**

- 0-10
- 11-20
- 21-30
- 31-40
- 41-50
- 51-60
- 61-70
- 71-80
- 81-90
- 91-100
- More than 100

**8. What type of digital media do you use to store your files? (check all that apply)**

- Flat or Delimited Text (.txt, .rtf, .csv)
- Software and/or Web Scripts
- Images (.jpg, .tiff, .gif, .bmp, .psd)
- Word Processor Documents (MS Word, Corel WordPerfect, etc.)
- LaTeX (.tex, .latex)
- Audio (.mp3, .aiff, mpeg, .wav, .mp4, .wma, .aac)
- Presentation Aides (e.g. MS Powerpoint, etc.)
- Post Script (.ps)
- Spreadsheets (MS Excel, Lotus 1-2-3, etc.)
- Mark-up languages (SGML, HTML, XML, etc.)
- Video (.avi, .mpeg, .divx, .mov)
- Adobe Portable Document Format (.pdf)
- Other (please specify)

**9. How concerned are you about the degradation of your digital data in the next 20 years?**

- 1 Unconcerned

- 2 Somewhat unconcerned
- 3 Neutral
- 4 Somewhat concerned
- 5 Concerned

10. Are you currently using a digital repository service to preserve your work?

- |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|
| Yes                      | No                       | Don't know               |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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**Survey on Digital Repositories - University of Michigan**[Exit this survey >>](#)**Information About Your Views on Digital Repositories (Page 3 of 4)**

**11. If given a choice, where would you prefer to store your items? (check all that apply)**

- Non-Profit repository
- University-wide repository
- Departmental repository
- Commercial repository
- Other (please specify)

**12. What type of digital media would you like to be able to store? (check all that apply)**

- Post Script (.ps)
- Software and/or Web Scripts
- Flat or Delimited Text (.txt, .rtf, .csv)
- Mark-up languages (SGML, HTML, XML, etc.)
- Images (.jpg, .tiff, .gif, .bmp, .psd)
- Video (.avi, .mpeg, .divx, .mov)
- Word Processor Documents (MS Word, Corel WordPerfect, etc.)
- Adobe Portable Document Format (.pdf)
- Audio (.mp3, .aiff, mpeg, .wav, .mp4, .wma, .aac)
- Spreadsheets (MS Excel, Lotus 1-2-3, etc.)
- LaTeX (.tex, .latex)
- Presentation Aides (e.g. MS Powerpoint, etc.)
- Other (please specify)

**13. Of your documents, potentially how many academic papers do you like to store in a digital repository?**

- 0-10
- 11-20
- 21-30
- 31-40
- 41-50
- 51-60
- 61-70
- 71-80
- 81-90
- 91-100
- More than 100

14. What kind of materials are you interested in uploading to a digital repository?  
(check all that apply)

- Video
- Presentations
- Project reports
- Software code/script
- Course materials
- Working papers/Pre-prints
- Journal articles
- Audio
- Technical reports
- Data sets
- Conference papers
- Images

15. Would you like the ability to make some (not necessarily all) of your data sets available?

- Yes  No

16. How important are the following characteristics to you for selecting a digital repository?

|   | Unimportant                      | Somewhat unimportant  | Neutral               | Somewhat important    | Important             |
|---|----------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Ability to control access to documents at different levels                | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Ability to be found using scholarly search engines                        | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Ability to be found using internet search engines                         | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Ability to be permanently linked to                                       | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Compatibility with other UM services (e.g. Mirlyn, CTools, Blue Stream)   | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Ability to license works (e.g. Creative Commons or contractual licensing) | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Permanent storage   | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Flexible metadata   | <input type="radio"/>            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|  |                       |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Support for different document formats | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Ease of access                         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Ability to overcome copyright concerns | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**17. What would make you hesitant to store your documents in a digital repository?  
(check all that apply)**

- Potential copyright conflicts
- No added value or advantage
- Uncertainty in future support from the University
- Difficulty in usage
- Lack of critical mass
- Time investment in learning
- The amount of time it takes to actually use the system
- Other (please specify)

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**Survey on Digital Repositories - University of Michigan**  
Information About Deep Blue and Closing Remarks (Page 4 of 4)

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18. Prior to this survey, had you heard of Deep Blue?

Yes

No

19. If so, have you used Deep blue to: (check all that apply)

Browse a collection

Search a collection

Store documents

Retrieve documents

Other (please specify)

20. If there are any comments or concerns about Deep Blue or digital repositories in general, please share them with us here.

21. Can we contact you for further questions or user testing of Deep Blue?  
If so, please provide your email address.

Note: Email addresses will be used for follow-up contact only.  
Your identity will not be linked with the other answers provided in the survey.

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**Survey on Digital Repositories - University of Michigan**

[Exit this survey >>](#)

Thank You

Thank you for helping us in making Deep Blue a better service for you.

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