

Amy M Ostrom & Kim Babcock
LIS810 GIS
6 August 2004

Technology of Today: Access to computers and computer resources in Wisconsin public libraries

GIS software is changing the way the world uses data and sees maps. Libraries across the United States, from those in the academic realm to others in the public sphere, are adding GIS technologies to computers for patrons to use in order to make maps and interpret data visually. We (Amy and Kim) decided to take up the GIS challenge by creating maps that would visually represent that use of technologies such as databases, Internet, wireless Internet, e-books, and other electronic resources within Wisconsin libraries. What we discovered was within different library systems in Wisconsin disparities were apparent and not all library systems offered the same types of technologies. In the process of making maps to illustrate these findings, we found that gathering data and using the ESRI ArcView software is frustrating and difficult to use, even on the good days. What follows is a summary of our methods, hypotheses, and findings with illustrated maps, what our findings tell us about the state of libraries and technology in Wisconsin, and a discussion of our difficulties with creating and mapping the data.

Background: Impetus for wanting to map technology data

In 2001, the System and Resource Library Administrators' Association of Wisconsin (SRLAAW) created a report called "The Pursuit of a Unifying Vision for Wisconsin Library Development" that listed the top five goals public libraries in Wisconsin were hoping to attain. Gathered by a survey of all the public libraries, the number one priority determined was access to electronic resources. The report also listed several steps to implement this, citing BadgerLink (a library web portal) as an example for positive outcomes using shared resources.

At the system level, this goal has very nearly been achieved. It should be noted that Kenosha County Library System is unique in that it only encompasses two libraries. Hence, if a service is provided to one of the two libraries inside of the system, it will be considered as being a part of the system services. Due to this predetermined goal or standard deemed necessary by all systems, we can collect some data at a system level pertaining to electronic resources. For instance, every system provides to its member libraries a federated online public access catalog (OPAC). Due to this expanded union catalog for the state, in theory all libraries in Wisconsin should have access to an OPAC either at the local, system, or state level.

Another electronic resource that can be divided into three levels of involvement is databases. The Department of Public Instruction (DPI) through its Public Library Development (http://www.dpi.state.wi.us/dpi/dltcl/pld/wis_lib.html) division provides statistics of all public libraries including population served, square footage, circulation statistics, budgets, amount of materials, etc. The new 2003 statistics at the public library level contain data at local, system, and state levels for databases. All libraries automatically receive access to 24 databases through the state level, but some libraries do not receive any database support at the system level. Currently three library systems do not extend their hand to their member libraries in this fashion: Southwest Wisconsin Library System (servicing 27 libraries), Winding Rivers Library System (servicing 34 libraries), and Arrowhead Library System (servicing 7 libraries) for a total of 68 of 380 listed public libraries are not receiving system level database support. Of those 68 libraries, 59 do not receive any databases at the local level.

We decided not to include document delivery and interlibrary loan (ILL) both as a type of electronic resource because all library systems are a member of Wisconsin Library Services (WiLS) (<http://www.wils.wisc.edu>). Even though all systems are members of this consortium, not all subscribe to every service available. For example, WiLS provides virtual reference service for Wisconsin libraries that only a few library systems provide due to budgetary constraints.

Many are looking into the technology though, which we noticed when looking at the library system response forms to a "System Services" survey that Jane Pearlmuter distributed to the directors of the 17 public library systems in June 2004.

From what SRLAAW proposed in 2001, Wisconsin public libraries have definitely increased the level of electronic resources available at the level that SRLAAW presides over. However, simply because the library systems are now providing many more services to their libraries, we are uncertain if the libraries themselves are providing the resources necessary in today's environment to its patrons. Therefore, many of the other technological data we wished to gather could only be provided at a local level. For instance, although all the libraries are provided with 24 databases by the state, does the library provide computers to its patrons to access these databases? Or if the libraries have computers, do they provide Internet access at their public terminals to access the OPAC provided by the library system? We have developed a graduated system of library technology "competency" to determine what areas of Wisconsin are still inadequately providing the electronic resources to its service area. We may recommend that if several libraries in one area do not provide a high enough "grade" that the system or state look at funding those areas for technology training and upgrading.

Methods for Mapping

In order to map the technological resources in libraries effectively, we devised a graduated ratings system in order to determine which libraries provide the most electronic services. The graduated ratings system is outlined as follows:

1. Library must have public computer terminals.
2. Library provides Internet access at their computer terminals.
3. Patrons can reach the library system OPAC on public terminals.
4. The Library has a website.
5. Library provides electronic databases to patrons.
6. Library provides electronic book access to patrons
7. Library offers virtual reference service.
8. Library provides wireless Internet access within the library.

A fault to this graduated rating system is that we did not weigh the services according to what may be more technology relevant, and made the scale what we believed to be a logical order for technology sources. One way we can determine whether libraries are providing services to its service group is to look at what potential users are in the area. According to Adkins and Sturges in their article "Library Service Planning with GIS and Census Data,"¹ by mapping a potential service population a library will be better equipped to make decisions about its plan of actions and policy making. School students are high potential users of the library, and the DPI provides many kinds of data that can be comparable to census data in an educational sense. By combining the public schools in Wisconsin, with correlation for enrollment and also computer science graduation requirements, we may be able to determine whether there is a difference in the amount of technology the libraries and schools in the area provide.

Map Hypotheses

At the start of the project, we believed that all public libraries should be at level three or above. These are the simplest of services the libraries can offer to their patrons. We also speculated that the bigger libraries and systems would be able to provide more services due to the amount of money in the budget and also the size of the service area. We also thought that the upper two levels would be least attainable due to the newness of the technologies. Live online reference help has not available via the Internet that long. Before, a patron could either ask a reference librarian in person or call a help line. Now through this new service, a patron can work alongside a reference librarian virtually. WiLS provides service through AskWisconsin and the

¹ Denice Adkins and Denyse K. Sturges, "Library service planning with GIS and census data," *Public Libraries* 43:3 (May/June 2004), 165-170.

South Central Library system offers the service through the company 24/7. Although all the library systems are members of WiLS, not all subscribe to this service.

In addition to virtual reference, another newer service is wireless Internet service within the library. This does require a laptop, and so some libraries have experimented in loaning laptops within the library, but this practice is not very widespread. Wireless service allows the patron to work from anywhere within the library on their own personal computer while researching. This combines and simplifies many problems of handwritten notes or seas of e-mails with bits of information. This phenomenon is much more used in academic libraries, and so these academic libraries have begun sharing this resource with surrounding area libraries. We don't expect many libraries to be offering this service, and those that do will be in the bigger city areas.

Maps

Most of the data we used was found at the DPI's website including the latest library statistics from 2003 and the newest data on public schools. We also gathered a good amount of primary data that took us many hours to complete. Unfortunately, we had to trim down a lot of statistics we had gathered simply because it was too much or not relevant enough to include. An example of this would be with the WiLS interlibrary loan and document delivery service. Initially we were going to include this into the ratings system, but after analyzing the five hundred members of the WiLS service, we discovered every library system was a member. Hence, including this would not prove beneficial. Something we had to add because of an unexpected issue concerned libraries actually being in their system OPAC. We went through and checked all system OPACs to ensure we knew what libraries were being represented at the system level.

- Map 1- Computers vs. Population (Appendix A): This map shows a correlation between the numbers of public library terminals normalized by the population of the city that the library is in. This data was compiled using the Department of Administration 2003 population estimates for Wisconsin cities and from the DPI's Library Statistics for 2003. There are five areas where computer ratios are higher than population.
- Map 2- Comparison of the number of public terminals and those with Internet Access (Appendix B): This is a summarized chart of the systems showing how many public computer terminals alongside with public terminals that have public Internet access. The map shows us that there is slightly more computers that don't have Internet access but it is pretty equal all around. This data is taken from DPI's Library Statistics for 2003 circulation reports.
- Map 3- Users of Library vs. Electronic Resources (Appendix C): The map shows the number of users of the library vs. the number of users of the library's electronic resources. For nearly all of the systems there are quadruple the numbers of in-person library visits compared to electronic visits. There is a high amount of use in the upper Northern tip of Wisconsin in the Ashland area, which is surprising. We do see what appears to be an anomaly on the map due to the high amounts of electronic visits vs. in person visits in some areas so we are not sure of its accuracy. This data is taken from DPI's Library Statistics for 2003 circulation reports.
- Map 4- Number of Databases at Local and System Level (Appendix D): This map shows the number of database subscriptions for public libraries at both the local library level and also the system library level. We did not include the state level because it provides 24 databases to every library in the state; hence no mapping of this figure is needed. Across most levels there is barely any local database subscription, except for those near Eau Claire and the

Southeast Wisconsin area. The Northeastern library systems offer more databases at the system level for their library patrons than other systems. This data is taken from DPI's Library Statistics for 2003 circulation reports.

- Map 5- Libraries with eBooks (Appendix E): This map is a simple display of those libraries that offer eBooks to patrons. All libraries except for those in the Southwest, Kenosha, and Arrowhead Library systems offer eBooks. This data was compiled from the Library Service survey conducted by Jane Pearlmutter in 2004.
- Map 6- Libraries with Virtual Reference (Appendix F): This map shows the libraries that provide virtual reference service with from AskWisconsin or 24/7. The providers of virtual reference are those libraries that are located in the central part of the state of Wisconsin. This data was compiled from Library Service survey conducted by Jane Pearlmutter and the WiLS online reference libraries list.
- Map 7- Libraries with Wireless Internet (Appendix G): This map illustrates which libraries provide wireless Internet access to their patrons. There is a conglomerate of libraries in the Indianhead Federated Library system that offer wireless Internet because of grant they has previously received from the DPI². Also all public libraries in Milwaukee have wireless Internet and well as some cities in Milwaukee metropolitan area. These wireless Internet statistics may not represent the reason why some of the libraries provide wireless. For example, it is possible that at the time wireless Internet was easier and cheaper to install rather than T1 lines. An interesting map that would be great to juxtapose this with is one that illustrates and compares libraries with T1, wireless, and dial-up Internet connections.

Results*

*Note: Appendices H through J map the findings

The maps reveal that there are technology disparities within Wisconsin and this is primarily show by looking at the maps of the ratings. A total of eight points could be collected for each library, each of the different types of technologies the library could offer equaling one point each. All libraries had at least four points, so our map only displays levels four through eight. Overall, technologies are lacking particularly in the Southwest Library System, Arrowhead Library System, and the Kenosha Library System in the southeast corner of the state (Appendix H). In order to decide whether this lack of technology impacts the community the library is serving, we used enrollment statistics and computer credit requirements of the k-12 public school systems (Appendix I) acquired from the DPI. From this set of data, we pulled the largest centers of enrollment as well as those areas that require 1.5 total computer credits to map as those areas with higher technology needs. Then, comparing the library ratings to our school information (Appendix J), we can see very clearly that of the systems, the Southwest Library System needs the most attention. These systems could apply for LSTA technology grants through the DPI in order to improve their lacking technology services.

Also the map results show that many of the schools are offering more technology opportunities than the libraries. This is shown in the map of the comparisons with enrollment, computer requirements and library ratings. Especially in the Southwest Library System this map demonstrated that the schools were making a better effort at technology improvements than the libraries in the area. This is also shown in the Eastern side of the Northern Waters library district. The maps are only speculations on the data that was provided to us by the DPI's website and don't reflect actual technology skills that might be present in the school and library system that weren't listed in statistics sheets.

Our difficulties and frustrations

² *Round About IFLS*, 2(2), July 2002, pg 1. [Online]

<http://www.ifls.lib.wi.us/roundabout/RoundAboutIFLS-july2002.pdf>, Accessed on August 5, 2004.

ArcView is a difficult program to master. A person cannot become an expert in four weeks for all of its unique quirks. Jack Dangermond designed it with professional experts in mind and not the average person. Most of our frustrations were with using the ArcView software itself and gathering data. We then scoured the Internet trying to find statistics for those categories we didn't have information on, in particular, virtual reference and wireless Internet access. Once the system survey results were released for us to use by Jane Pearlmutter, we were able to enter in statistics to an Excel spreadsheet by looking at the library name and what system it belonged to. This survey provided us with most of the data concerning electronic databases, eBooks, and virtual reference. Most of the wireless data we gathered by going to each library website and looking to see if they had wireless Internet listed as a service. It was quite a painstaking task but was completed. Once the data were entered into the proper spreadsheets, the fun task of creating map had begun.

The primary shapefile we used was easy to find but did not come without difficulties. It was a shapefile of cities of Wisconsin provided by National Atlas and is available for downloading at their website. Upon first look, we thought the shape file had all cities and towns of Wisconsin. Low and behold, once we tried to geocode the maps, twenty cities didn't exist in the shape file and we had to manually plot each city by comparing our map with a MapQuest map. The process of geocoding itself proved to be difficult to master and making sure everything linked up. The most important thing we discovered after geocoding several times without success was to check the data to make sure it was correct more than once. This step proved to be vital once we had made a master shapefile that had all the attributes to map by listed.

This project couldn't have been finished on time without two partners. On average, we spent approximately 40 combined hours a week on the project gathering and mapping the data. If one person were to do this project it would take a minimum of eight weeks to complete, assuming the person knew how to use the software at a beginner level when starting.

Conclusions

This project proved to be a huge undertaking with a lot of primary data collection. The results we discovered help us to determine which areas in Wisconsin are lacking in technology services. The graduated ratings scale was helpful to determine which libraries were meeting the goals that SRLAAW set out for libraries and electronic resources in 2001. For the most part libraries are proving useful electronic services and looking to also improve upon the electronic services they already provide. We hope that these maps will illustrate how libraries systems compare to one another with the electronic services they provide, and also show which systems need funding to boost their electronic services.