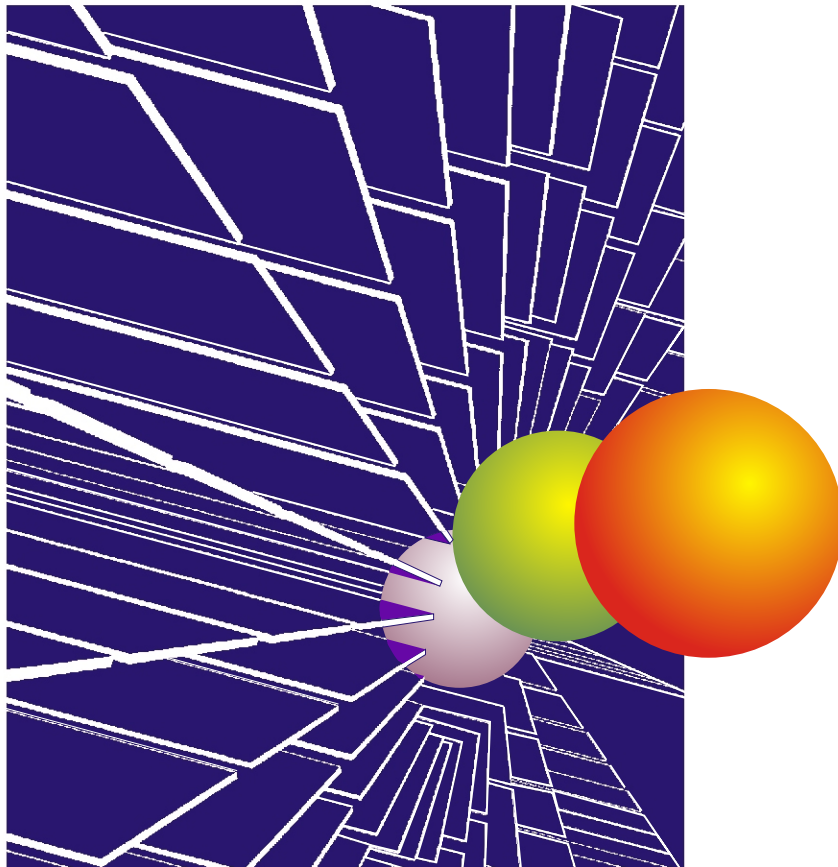## MoDOT

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RDT Library System Development, Year 2

RI 98-026A

June, 2004

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16. Abstract The report documents year two efforts relating to the analysis, development, and implementation of the Missouri Department of Transportation Research Development and Technology automated research library system. Specific issues include collection development and distribution, copy and original cataloging and classification, and development of and training for circulations and operations. Also included are funding and budget information, and recommendations and objectives for the year three project development plan.		
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Final Report

MoDOT Study Number RI98-026A

"RDT Library System Development", Year 2

MISSOURI DEPARTMENT OF TRANSPORTATION
RESEARCH, DEVELOPMENT AND TECHNOLOGY

BY:

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JEFFERSON CITY, MISSOURI
DATE SUBMITTED: June 2004

EXECUTIVE SUMMARY

The primary project objective is to provide expertise in support of the Missouri Department of Transportation (MoDOT) Research, Development and Technology (RDT) unit's decision to sub-license Q-Series library software applications from the Information Systems (IS) Division of the Missouri Department of Transportation. The focus is on the continuing development of the RDT Library in an open fashion that will support the following areas:

- Make continuing recommendations and expand use of the EOS Q-Series application functions.
- Convert original local collection and new items through copy and original cataloging.
- In cooperation with MoDOT personnel, make recommendations for external document delivery and support solutions.
- In cooperation with MoDOT personnel, support the design and development of a digital web site and databases representing the selected portions of the "library collection", including bibliographic records, housed within RDT.
- Research and recommend document delivery solutions for RDT end users accessing documents using the Q-Series application.

The researchers hope that the outcomes of this study provide an effective digital access point for distribution of RDT journals, reports, and texts. This report also provides a model for the expansion of similar library information systems to other departments within the Missouri Department of Transportation and for scalable distribution of local materials.

The continuation of this research through sustained efforts required to support operations of a physical and digital library facility is recommended. This includes research and implementation of more globally efficient methods of document conversion and distribution, and the further exploration and use of services provided through relevant consortiums and memberships. In addition, the research suggests that an

integrated, global model describing MoDOT RDT Library services and operations, including a vision of scope, and requirements for expansion sustainability, is the most effective future planning course.

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Introduction

In January 2002 officials at the Research, Development and Technology (RDT) Division of the Missouri Department of Transportation contacted Charles Nemmers, University of Missouri Department of Civil and Environmental Engineering, College of Engineering, seeking assistance in helping to provide expertise in support of the RDT decision to sub-license Q-Series library software applications from the Information Systems (IS) Division of the Missouri Department of Transportation, and to provide a model for the development of similar library information systems.

The challenge was to develop the RDT Library in an open fashion that would support expansion to other departments within MoDOT, by providing a digital access point for distribution of RDT journals, reports, and texts. During year one of the project, the challenges were addressed by establishing a Machine Readable Cataloging Record (MARC) record cataloging and classification system, by the creation of records and entry into the Q-Series Online Public Access Catalog (OPAC), and by developing and implementing a basic shelving and circulation procedure.

The research follows the development trend of similar library facilities including those at the Minnesota Department of Transportation Library (http://www.dot.state.mn.us/library/mtl.html), the Northwestern University Transportation Library (http://www.library.northwestern.edu/transportation/), and the Transportation Research Board's Transportation Research Information Services (TRIS) (http://199.79.179.82/sundev/search.cfm) and Research in Progress (RIP) (http://rip.trb.org/) database web sites.

Year two efforts included a continued focus on the cataloging, classification, and entry of records into the EOS Q-Series system. In addition, procedures for the shelving and circulation of records were implemented, including training materials and workshops for RDT research personnel and MU Team members. In addition, a number of external partnerships and service were developed and fostered including affiliations with Online Catalog Library Company (OCLC), the Midwest Transportation Knowledge Consortium (MTKC), and the Missouri State Library. Finally, a web based access point containing links to frequently access online transportation research materials including online transportation news, journals, and databases were developed. This work followed similar efforts by other state DOT's as referenced in the findings of the Midwest Transportation Knowledge Network survey regarding services desired by DOT managers and researchers.

Objectives

Specific tasks outlined in the initial year two plan include:

- Make continuing recommendations on improving the RDT library services and expand the use of the EOS Q-Series application functions. Connect the expanded use to the continuing development of media conversion and research personnel information skills.

- Convert original local collection and new items through copy and original cataloging.

- In cooperation with MoDOT personnel, make recommendations for external document delivery and support solutions.

- In cooperation with MoDOT personnel, support the design and development of a digital web site and databases representing the selected portions of the "library collection", including bibliographic records, housed within RDT.

- Research and recommend document delivery solutions for RDT end users accessing documents using the Q-Series application, including resource sharing and system interoperability.

Present Conditions

At the present time, there are a number of improvements to the general state of RDT information access and retrieval:

- All of the major report series, including the Transit Cooperative Research Program (TCRP) and National Cooperative Highway Research Program (NCHRP), and the Transportation Research Report (TRR) series were cataloged and converted to digital form using the EOS system.

- A part time staffing solution was implemented to oversee on site library operations including circulation procedures, collection management, and access.

- An html web site providing a single access point for transportation research materials was developed according to Missouri Department of Transportation web publishing and initial steps were taken, for increasing the availability and access of RDT library records in a distributed fashion.

In addition, efforts were made to improve library operations including part time staffing of the facility by an American Library Association (ALA) certified librarian, development of a web based delivery system, and training and development for end users and cataloging assistants.

Technical Approach

The technical approach of the project is presently targeted on three fronts:

1) Improving library operations, including the development of services and user training;

2) Resolving technical information issues involved with the cataloging and classification of library items, including the use of OCLC services, batch cataloging, and the importation of copied records; and

3) Addressing issues relating to facility development, distribution, and access.

Library Operations

A continuing cornerstone of project technology is the EOS Q-Series library information system. The system stores and processes library data using an Oracle back end database management system. Library functions are supported using the EOS software application interface. These operations are assisted by a barcode scanner that allows one step tracking of availability and circulation. The system uses barcode tags applied to individual items. Items contained in the system are accessed by users and end users through a web-based interface Online Public Access Catalog (OPAC). The OPAC web pages reside on the MoDOT intranet, and authorized users are able to search the library document holdings from their desktop PC.

At the outcome of year one, there were a number of issues the MU team identified for improvement.

1) Circulation was based on a self serve format whereby users would locate items in the system using the OPAC interface, and then scan or manually check out the item from the EOS system, creating a circulation record. They were also responsible for checking items back in, and returning them to the shelf. In addition, because of a lapse in implementation of labeling equipment due to supply and training issues, a number of the initially cataloged items were not tagged upon cataloging and entry into the system. This is a problem. The team identified staffing of the library as the best solution to address these in-house operations challenges, and plans were made to implement a solution in year two.

2) Currently all cataloged items have been fitted with shelf location labels bearing a library of congress call number, or a label based on the series title, and shelved accordingly. It should be noted that although that items may have differences in the printed spine label, all items possess a unique library of congress call number

within the EOS system. The differentiation in shelving tags increases the effectiveness of user searches by allowing items to be located by familiar title acronyms, like NCHRP, as opposed to less familiar shelving classification systems, like the Library of Congress classification schema. Although the Library of Congress system is more complex, it is necessary for many aspects of effective collection management.

3) In addition, previous circulation methods are now supplemented by a certified librarian (part-time) and other MU Team members. The library staff person performs the traditional role as gatekeeper of incoming and outgoing materials, as well as performing cataloging and acquisition duties, and assisting in the development of training materials and guidelines.

4) Further, there were training and process issues regarding EOS Q – Series that were addressed. Though the EOS Q-Series is intuitive and user-friendly by most standards, there remained some basic processes that needed to be targeted through training for the overall system to operate smoothly, and for users and end users to achieve research goals. Having a trained librarian on site improved the overall operation and was particularly valuable when technical questions arose or problems surfaced. The guidelines, which we developed, helped to address two main issues. First, because the facility was initially self service, and still remains so in some instances, it was necessary to provide novice users with not only the skills to locate items, but manage the distribution of items by checking them in and out through the EOS circulation module. Second, because the MU Team members also assist with circulation, labeling, and other procedures, they required guidelines for the effective practice of these operations as well.

One of the most apparent changes in the library in year two is the level of service implemented. In addition to a regularly published acquisitions list, the library handles web search requests by phone and email, provides EOS OPAC collection and web resource searches, and interlibrary loans functions. In addition, policies were developed to foster implementation of service operations including circulation policies

and procedures (these policies are included in the appendices). Finally, MU Team members assisted in the coordination of training workshops sponsored by affiliate organizations such as the Midwest Transportation Knowledge Network and the OCLC.

Technical Information Issues

There were information issues involved with the cataloging and classification of library items including the use of OCLC services, batch cataloging, and the importation of copied records. During year one, copy cataloging operations were done by manually copying MARC record information from html pages found on existing online sources, like the Northwestern Transportation Library collection (NuCAT), and the Minnesota Department of Transportation library (MnDOT Library) into individual EOS system records. This meant that data field information had to be cut and pasted individually into the EOS Q-Series record. This caused excessive processing time as each record had to be hand drafted field by field. In addition, there was often a need to make inclusion decisions regarding information from the copy record. Sometimes the data was excessive for project needs, sometimes the data was incomplete and needed to be added. To address this challenge, it was recommended by the MU team that a method of batch importation of records be investigated.

The issue was addressed by using copy cataloging tools through OCLC Cat Express services. Training was conducted by the OCLC staff in August 2003 for MU and MoDOT personnel. This allowed the complete existing MARC records to be located through World Cat, a proprietary database containing millions of MARC records worldwide. These records could then be saved online as a batch file, and then retrieved at a later date by PIN number and downloaded to any of the MU Team or MoDOT

facility computers. This batch file is then transferred into the EOS system using the system import function, and reconverted into individual records for storage and retrieval within the EOS system.

However, it was discovered that a modification was needed to the record after import to reflect the individual MoDOT facility holding code. This was required as the Missouri Department of Transportation has a single user authorization for the OCLC service, yet there is more than one branch facility each with its own holding code identifier (40 field) using the batch service. In addition, some records required other minor changes to reflect instances particular to the library schema itself, for instance the preference for using the LC or Local LC call number (50 or 90 field).

Facility development, distribution, and access

Issues relating to development of the physical facility, methods of record distribution, and online access needed to be addressed if the RTD library is to serve as intended. In year one, the physical collection was culled for currency in order to make space for more accessible shelving layout, and to reserve space for collection development. Therefore, titles before 1990, or felt to be no longer useful were archived at the MoDOT archiving storage facility. During year two this space was restructured to include more adequate space for shelving items distinctly. This, along with the new labeling system, allows discrete items to be located much more quickly and accurately than prior to facility redesign.

One outcome of year one was an increase in internal requests for access to web based materials, and requests for research materials from external research parties. Given this trend, a strong emphasis was placed on streamlining access to web

resources by developing a single access point to commonly used transportation research web sites. The web site provides access to a wide variety of online transportation journals, news, databases, and statistics.

A prototype site was designed to function as a seamless sub section of the standardized Missouri Department of Transportation public web site. This required reverse engineering of existing MoDOT web pages so that web content by the MU research team is consistent with content published by the MoDOT Public Information Office. This included incorporating Cascading Style Sheet (CSS) tags that are identical to those used to mark up or format specific elements of text style. Also, all navigation elements were adjusted into a standardized list style format consistent with that used throughout the MoDOT public web site. The prototype library site contained nine pages with links to transportation news, journals, databases and OPACs.

Another strong focus in year two was the fostering of distribution efforts through a number of methods and partnerships. This increased access to materials and services. For instance, in addition to the internal references services described above, year two efforts resulted in the implementation of Inter-Library Loan capabilities for library materials. This means that RDT materials can now be shared regionally and nationally. The process uses both internal and shared operations. Typically, the RDT library worker will try and locate an item within the RDT collection. If it is not available, a search is made of the MTKN member library holdings. Items found in World Cat can be borrowed through OCLC loan, but this requires filling out a form and is not as convenient as borrowing through the MTKN system.

If the item is found, a request is emailed to the holding library. The member library transports the item to the RDT library. Then the item is sent to the patron with a due date (and this can be expedited via UPS or FedEx if needed). The patron is contacted 3 days before the due date to see if a renewal is needed. If so the lending library must be contacted to arrange for a renewal. An Excel spreadsheet was created for the purpose of maintaining ILL transaction information. This was needed because the EOS series does not currently interface with MTKN or other affiliate libraries, such as MOBIUS affiliates or the OCLC.

Results and Discussion (Evaluation)

Year two saw increased and expanded use of the EOS Q-Series application functions including barcode, scanner, and labeling equipment for daily operations and collection organization. In addition, the circulation module of EOS was implemented to track patron accounts, usage of document types and series, and to aid in locating items in the physical library. Continued use was made of the distributed cataloging potential of EOS used in conjunction with remote connections and laptops computers. Production progress during the year resulted in cataloging, labeling, and shelving, the majority of current series, including the TCRP, NCHRP, and TRR reports series. New titles to each series are cataloged and added to the EOS system on a regular basis as they arrive.

As a general purpose solution, the EOS system continues to be a very good fit for the type and size of facility. The system, while requiring frequent updates, runs effectively. And as our needs advance, it has been flexible enough so far to meet changing demands. As a result of this and other progresses, there are currently more

than 3300 RDT titles available within the EOS system from the library terminal or via the OPAC from personal computers located through out the MoDOT intranet. More important, these titles are easily located, accessed, and managed within the physical facility. A rather strong misgiving is that although developed, implementation of open World Wide Web access to the EOS OPAC and other web media has not been established. This practice follows the general trend in the library industry, especially by world wide government and business organizations, towards "technologies and methods that will allow information professionals (and end users) to bring structure to the vast amount of unstructured data that is available in today's Information Mall (DaRosa, p1)".

Technical requirements aside much of the success in the area of operations related to the implementation of dedicated staffing and shared partnerships. A standardized staffing plan using part time personnel resulted and this allowed the MU team to implement functional services to the library, including reference assistance for internal and web referenced materials, not previously possible due to time and space logistics.

A particular success is the expanded capacity for sharing materials through the Inter-Library Loan process. This service has allowed the library to reach and assist researchers far beyond the physical boundary of the RDT library. Creating access and distribution points through shared resources extends the use of our available technology, increasing the value of investment in the RDT library system in particular, and strengthening the resources of the transportation research community overall.

Perhaps the most encouraging new use of the EOS system was the "import" function. When used in conjunction with a dedicated external cataloging tool, like the OCLC service, batch records are imported into the Q-Series in a much more efficient manner. In addition, the standardized OCLC copy records make the sharing of documents between libraries easier because separate facilities have a common means for identifying an item. During year one the team did not have access to the full function OCLC copy cataloging tools. In year two we gained access through participation in the Midwest Transportation Knowledge Network (MTKN). Team members participated in an OCLC 2 day training session covering the basic use of the tools in August 2003. For a number of reasons, the OCLC Cat Express system is now the preferred tool for RDT library cataloging. It has access to the entire OCLC database of titles, records can be created in batch instead of singly, and RDT records can also be uploaded into the OCLC holdings providing the greatest geographic coverage. Tools and training for OCLC applications as well as EOS have greatly streamlined the copy cataloging process.

Team members also worked to identify and implement solutions designed to make it easier for RDT users to locate and access documents. Currently, researchers can locate library documents on an intranet web based Online Public Access Catalog (OPAC), or through the EOS application on a PC terminal in the library itself. The PC terminal application allows authorized users to check in and out materials to his or her personal account using a PIN number manually or using a barcode scanner. In addition, cataloged documents and shelves have clear, professional labels to mark document

location the library. The RDT library now publishes a listing of new items to branch facilities and organizations each week.

In cooperation with MoDOT personnel, year two efforts also resulted in a number of partnerships designed to increase document delivery and sharing potential. For example, in addition to utilizing copy records from the OCLC Cat Express service, we are uploading our own unique records to the OCLC databases. This allows us to share information about RDT records in a standardized OCLC format worldwide. Further, planning is currently underway to partner with the Missouri Bibliographic Information User System (MOBIUS) to distribute RDT records and establish inter-library loan sharing capability of RDT records on the MOBIUS Missouri statewide network. This will allow us to share documents at research locations throughout the regional Missouri area, as well as providing another option for the distributed sharing of records in addition to the currently implemented Midwest Transportation Knowledge Network (MTKN) distribution system.

Finally, MU Team members in cooperation with MoDOT personnel developed a digital web site representing widely recognized and validated transportation research resources found on the web. This single point access to transportation web resources is similar to content found on many of the nations leading transportation web sites, such as the Minnesota Department of Transportation Library, Northwestern Transportation Library, and the Harmer E. Davis Transportation Library at Berkeley, and follows the recommendations of the Midwest Transportation Knowledge Network concerning what state DOT managers want in research facilities (Sarmiento, p6).

The content for the web site was developed after interviewing researchers in the RDT facility. Some users offered suggestions about types of content such online journals, news, and events. Other requested specific sites to be listed, such as the Transportation Review Board (TRB), Transportation Research Index Service (TRIS), and other frequently used resources. In addition, information concerning library operations, such as particular RDT library services and schedules were included. It is very important to involve the web-site user in the development of the web-site contents and protocols. By doing this with the library site we expect more use and the channels are now open for further improvements.

Conclusions

From a business system standpoint, the outcomes of year two are different than in year one. In year one the focus was towards facility planning, product production, and initial process implementation. In year two, there was a drive for process streamlining, service expansion, and distribution scalability. Likewise, there were somewhat different results. First, the requirements for effective operational support using current technology requires focus on a number of diverse skill areas, including effective troubleshooting of technology components. While it is possible that these skills be mastered by a single individual, expertise in these areas often comes through experience, and so the best solutions to day to day operational challenges are most often through the consultation and collaboration of team members with varying skills and experiences. This is particularly true in cases where personnel are not familiar with the same processes and/or equipment, and where implementation requires an understanding of the interaction of the entire RDT library system as a whole, as it is a

rapidly changing environment given to the rapid rise in ill-defined problems. Towards this end a number of staff skills have been identified through OCLC research in 2002. These factors can help meet the challenge of the changing development climate including:

- members working well collaboratively and in teams
- members that are comfortable with electronic materials and services
- members that excel in new or nontraditional library roles.
- members that can design systems that "meet users where they are"

Second, year two has seen a large increase in RDT library service demand. When the library services were made available, researchers started to access the library more frequently. This makes it logistically difficult for a single staff member to handle all of the cataloging; reference service, inter-library loan, and technical equipment demands like are commonly found in similar DOT research libraries. Currently the library requires the part time efforts of 4 persons, including one 20 hour staff person. This staff solution provides minimum coverage of the facility throughout the 40 hour week, while allowing for contingencies such as increased service demand, training and orientation of users and staff, coordination of the three current shared resource partnerships, and troubleshooting and resolution of technical issues. In comparison, the Minnesota Department of Transportation Library maintains a diversely skilled staff of 8 persons. Therefore, because of the expanded operational and technical service capacity of the library, it is strongly encouraged that an adequate degree of staff coverage be established that is consistent with similar facilities to ensure the MoDOT RDT library's continuing excellence as a state DOT research facility.

Additionally in year two, physical facility operations were streamlined so that ease of use and potentials for expanded service increased. Interestingly, this was partially achieved through the natural 'evolution' of the collection from a loosely categorized group of items into a fully functional catalog of research holdings. This is effect is visible on the shelves where items and their corresponding shelves are grouped and labeled accordingly. Further, the transition to a functional catalog of holdings was noted in the growing number of RDT objects in the EOS system now available to researchers.

But more important to the operations process, library staff members now serve as a gatekeeper. This improves library service and operations in a number of ways, including: coordinating internal library operations, facilitating shared programs and partnerships, and providing feedback to technical personnel regarding system operations and technical services. For example, at the end of year one, the library was primarily circulating materials on a self serve basis. In fact, one of the complaints from researchers early in the initial planning phase was the fact that items were often relocated on a semi-permanent basis to a particular researcher's cubicle or workspace. This of course made borrowing the item difficult. With the inclusion of library staff, materials are not only circulated, but regulated and monitored. This increases the efficiency of the sharing process, helps to reduce lost and damaged items, and puts a visible 'face' on library services. As a caveat, it must be noted that while library operations for traditional, internalized materials are functional at this time, there lacks a clear plan for the growing challenge of formatting and delivering of items, especially nontraditional items like e-files, full text documents, and real time access to other

information (contextual knowledge), for instance alerts, or sudden changes to the system.

The growth of library services was strong throughout the year. Technical services triumphed in the initial completion of the majority of serial titles greatly increasing the traditional collection, and library service operations were expanded to include services like staff assisted circulation and inter-library loan. These successes evolved from the continued use of the EOS system and other existing technologies. Other successes were more subtle, and more attributable to the human element. Operational service enhancements like emailed 'new item' acquisitions lists and patron 'reminder notices' provide an intuitive type of service management that can only be currently handled in the RDT library by a human, and most effectively by those trained in library and information science.

As noted, the collection of cataloged holding grew to over 3000 titles. While this is impressive, care must be taken to ensure that the current holdings will continue to be accessible given the trend toward new formats and delivery systems. There were a number of major improvements made to increase library record distribution. This provided more effective service, and increased audience base. One measure was the utilization of OCLC services to increase standardization of copy catalog records, and increase coverage area of RDT records through the World Cat bibliographic catalog.

In year one cataloged records were taken from a number of different sources. Because librarians do not all catalog in the same way, and libraries coverage requirements vary depending on policy, there were resulting inconsistencies in the EOS copy records depending on the source where the MARC record was taken. The OCLC

service provides a platform to develop and distribute records that are uniform and global. World Cat is the most widely used bibliographic catalog in the world. Therefore records copied from this source are likely to be the most widely referenced version of the record. This means that RDT copy records will be as close to the most widely used format as possible.

In addition, as RDT records are uploaded to the OCLC, our records become searchable worldwide. In this way the library catalog can be extended beyond the physical walls and boundaries of the immediate EOS system at little cost. The OCLC services provide a strong base for catalog standardization and distribution. Similarly, partnerships that increase the loan capacity of the library, like those with the Midwest Transportation Knowledge Network and MOBIUS, provide a cost effective way to get items into the hands of researchers.   However it is noted that in the recent 2002 Environmental Scan it was felt there was less need for human copy cataloging – presumably due to cheaper computer methods - that copy cataloging is not a sustainable model for the future (DaRosa, p6).

A web site prototype was developed to investigate a way to tie the elements of the dissemination and distribution points. The site consolidated current content from over 20 industry online resources, providing ready reference including legal issues and database driven statistics. In addition there were links to 9 separate transportation library catalogs from around the United States.

Sites like this contribute to the sharing of transportation research information. Part of the reason for this is flexibility. Its common knowledge that the web based format allows content of many media types like video, databases, and documents, to be

embedded in a single access point. In fact, web based resources were identified by researchers at RDT as a highly desired resource because it allowed users to reach many points without having to leave the desk. While web based resources are widely recognized as important, the implementation of these types of public resources throughout the transportation research field currently varies across institutions.

Recommendations

Regarding library operations, it is suggested that efforts be focused on the sustainability and expansion of physical facility operations, including service, instruction, collection development, and the distribution of objects. Toward this end, a strong first step would be to develop library staffing more fully. This includes defining the role and business requirements of library staff position(s). Simply put, given the inevitable trend to divergent research content (web and traditional) library staff must address not only those traditional needs, but those recently identified, such as web reference, 24/7 access, and the ability to access multiple content types using a variety of tools.

Another recommended way to strengthening library infrastructure is by implementing information literacy for library users like as suggested in the OCLC recommendation for moving users to self sufficiency (DaRosa, p4). This can help free the librarian for other duties. But more important, it reflects the change of the 'turnstile' library to that of the 'self-service' facility .This causes a change in role for the librarian, and a need for retraining researchers in this new area of information literacy, particularly the ability to locate and validate web sources effectively. Efforts to analyze this issue should be investigated, developed and implemented. Also an imperative is raised so that the library plan might plan accordingly for adequate staffing in a manner that

recognizes evolving roles, ensures preservation, and balances traditional and non traditional content (DaRosa, p6). This type of library instruction is typical practice at most facilities and is required course work at some academic libraries, like Iowa State University Library.

The training offers some good benefits with limited expense. First, it may help address the shift in research processes from internal, analog methods to more digital, distributed methods by helping people to understand and use library search tools, like the OPAC more effectively. In addition, it might help users become more effective with existing web resources until such time a consolidated research oriented web interface can be published in the MoDOT realm, and during periods when library staffing is unavailable for reference web scouting.

In the area of collection development, investigation should be made into the logistic requirements for expanding the collection, including costs of cataloging new items, and the physical space to store them effectively, and measures for future conversions requiring pace with media and technical changes. There is limited physical size in the existing facility, yet continuing receipt of new objects, and a rapidly changing information environment. Currently there is no clear area for collection expansion, although new titles continue be received ate the rate of 5 or 6 per month. Therefore, steps should be taken to plan for an eventual need for physical space to allow for collection expansion. In addition, efforts to improve the distributed cataloging process should continue. This includes continued upgrade of the EOS software, laptops and related periphery hardware, and availability of tools and materials required to sustain and to improve the quality of library technical and service operations.

Efforts should be made to further improve distribution methods. For instance, streamlining of distribution processes by utilizing the most effective resource for each specific function may be possible. This is similar to year two efforts to standardize the catalog using the OCLC catalog as a point of uniformity for RDT records. Currently we are using a number of interlibrary resources including the MTKN, MOBIUS, and based on individual request. It may be possible that these services may be more effective if consolidated as it would decrease training and production time lost using multiple procedures and tracking multiple resource contact points.

In addition, it is recommended that a consolidated, web based interface to access online research materials be implemented. At the present time, the MoDOT Information Services division has proposed a hardware solution that might allow for web based distribution of the RDT EOS catalog, and access to external web resources from a single interface.

Also, the possibility of developing web based services resources, like chat and email reference services may be investigated. This would help solidify the expansion of library reference service beyond analog (telephone) and physical means (face to face and snail mail), and is congruent with the types non traditional information services identified as desirable by DOT managers (DaRosa, p6). In addition, it might potentially increase operational coverage by allowing team members to use the laptops to answer queries from distributed points, thus eliminating the need for them to be physically present at the library to provide reference scouting. Perhaps most important, with the increased service and technical operation advancements of year two comes the need to establish a staffing plan that will allow for adequate coverage of the diverse range of

multiple tasks encountered during daily operations, and provide provisions for the training, orientation, and attrition of specialized staff persons trained in the library information roles identified by staffing configurations of current state DOT libraries.

Observations and Discussion

On a final note, there remain a number of issues identified by state DOT managers through the Midwestern Transportation Knowledge Network as wanting for filling the requirements of typical transportation research needs, including those at the MoDOT facility, these include:

- Providing abstract or short descriptions in catalog records

- Providing authority control for MARC records

- Electronic Delivery of interlibrary loans item

- Libraries to go full electronic and virtual , including loans

- Availability of research on the desktop

We currently have the technology to implement these services. However, there are logistic challenges that currently hinder implementation.

For example, because the EOS system delivers results with limited text description, usually the title, abstracts can provide a more complete description of an item, like is found in many data base driven OPACs.

Also, authority control indexes for bibliographic are a valuable tool in helping researchers determine which item to select. This is particularly useful in situation when multiple articles are retrieved from authors or corporations with names that have different spelling. For example, Harry Truman might be listed as Harry S Truman, Harry Truman, President Truman, etc. An authority file groups all these common varieties

together so that when you search for one, you will get all of the other versions as well. This type of value added processing, can decrease search time, and allow for more effective researcher survey of results for usefulness and relevant meaning.

Regarding ILL loans there is a final mile regarding true electronic delivery. This is most likely due to lack of coordination between member facilities, technical, and political incompatibilities. Currently, a human mediator is needed for distributing or loaning textual information. Implementation of this type of purely electronic distribution especially in full text would be logistically difficult requiring a high degree of interoperability and cooperation between great numbers of systems maintained by different stakeholders.

However, it is possible to distribute MoDOT RDT self generated reports in full text, access and distribute daily industry news, and even this report from MoDOT desktops through email. Further, steps such as these require little planning or resources, so are cost effective, and help solidify MoDOT's place as a leader in the transportation research technology transfer field.

Finally, there is a strong desire to integrate a number of necessary methods to the individual desktop. This allows researcher's access to not only traditional controlled research content, but that anachronistic, but highly desirable content available on the web. Accessible content is valuable. Simply, libraries that provide access to both traditional and nontraditional (web and other media) are those that are most valued, and likely to be sustained by the public or organization.

After experiencing the development of the special library from the ground up, the logical impression is that while issues from year one were met, they still remain as a key

element of current operations that require support. Likewise, while the challenges of year two were defined and addressed, they also require further service and sustainability.

There is a solid technical and service infrastructure, a rudimentary yet functional staff solution, and growing base customer base of internal staff, Missouri library patrons, and other researchers from around the state. The positive outcomes of the MoDOT RDT library project, and recent trends in the research library industry, point to the continued success and most likely increased need for library information services like those at the MoDOT RDT Library. However, just as challenges arose through years one and two, this transition will likely see great change as Federman notes regarding system development:

> "What we conceive about our business is not sufficient to fully understand all the effects that are actually happening in and around our business. We are completely unable to perceive of all the dynamics of our business environment because our conception limits our perception. Our accumulation of, and intense focus on, our knowledge controls what we believe. And, what we believe controls what we are able to see. What haven't you noticed lately (p1)"

These observations about the cracks in knowledge systems despite all precaution run deep, but reflect strongly on startup enterprises in ill-defined fields like the hybridized RDT Transportation library which contain both digital and traditional content. Because research and technical business requirements and means are changing almost daily, the ability for libraries (and library teams) to be successful requires providing continuing access to valuable content, in an expected manner, including adequate technical and personnel resources, while staying abreast of the

constantly changing research environment. Ironically, where the library was once seen as a stoic statue, it now sets poised as a vigilant sprinter.

Implementation Plan – Year 2

Implementation Objective

UM-C will provide expertise in support of the RDT decision to sub-license Q-Series library software applications from the Information Systems (IS) Division of the Missouri Department of Transportation. The challenge is to develop the RDT Library in an open fashion that will support expansion to other departments within MoDOT.

Affected Business Units and Principal Contact

Research, Design and Technology Transfer
Michael W. Shea
MoDOT/RDT
573-751-0852

Implementation Period
March 2003 – March 2004

Funding

Year two funding for the project came from MoDOT's State Planning and Research (SP&R) program and was contracted to the University of Missouri-Columbia through a Task Order Contract under the Basic Agreement that UM-C has with MoDOT. Year 3 funding will be a new contract in effect extending the Library support function. The initial objective remains the same.

Technology Transfer

Year two work resulted in a number of technology transfer instances and advances. Library operations are now facilitated half time or more by a human facilitator. This allows circulation operations to be increased and handled more efficiently. In addition, record distribution was greatly expanded through use of OCLC copy cataloging and

World Cat OPAC technology, allowing for mass import of standardized records from the OCLC into the EOS system and vice versa. Also, laptops for distributed cataloging were upgraded from 200 mhz to 700 mhz machines. This increase in processing power will help increase speed of transfer for import records from the OCLC. In addition, the power increase should help eliminate machine lockups when handling large amounts of data.

Finally, planning was developed to sustain the efforts of year two research and production including:

- Designing and providing staff development and training as requested

- Developing an implementing online prototype content within the prescriptions of Missouri Department of Transportation web publishing standards

- Continuing the conversion of records to national bibliographic standards to create a current, complete, and comprehensive database of bibliographic holdings.

- Continuing assistance in the implementation of operational services and procedures

Procedure

Primary team member duties

All MU Team members participated in most activities and areas. Individual members are assigned to address specific areas as needed. During the first quarter of year two, Sara Pensgard was primarily responsible for implementations in the physical facility. Clara Laio, a team member from year one assumed this role in a half time MoDOT RDT position, where she now serves as the primary physical facility librarian. Clara continued the process of collection assessment and organization, and the physical and technical

aspects of circulation and library operations. She refined these processes by developing and drafting written procedural guidelines for key library operations, like circulation. In addition, she implemented training programs to orient RDT staff in library procedures and policies. She also coordinated contact with the Missouri State Library, MOBIUS, and OCLC persons. Lori Bain facilitated primary cataloging production during the first six months of year 2. She was initially assisted by Clara Laio. In October, two new members, Chad Pollock and Fang Huang joined the MU team and began assisting with the copy cataloging operations. All of this work on the project under is done under the direction of Dr. Tom Kochtanek.

Technical issues, such as usability testing for cataloged records, the design and development of web prototype pages and text markup, technical research, and official reporting documents were designed and implemented by Sean Cordes. Team coordination including workflow and task management, agenda coordination, and progress reporting was performed by Sean Cordes under the mentoring of Dr. Kochtanek.

Bibliography

Federman, Mark. McLuhan Program in Culture and Technology, University of Toronto, Information Highways Conference 2003, Keynote Speech delivered March 25, 2003.

De Rosa, Cathy; Lorcan, Dempsey; Wilson, Alane, ed. 2003 OCLC Environmental Scan: Pattern Recognition, Online Computer Library Center, Inc. Dublin, Ohio, (2003).

Kell, Lee Ann. Library System Functional Requirements, (MoDOT, 1999).

Sarmiento, Roberto, A. Midwestern Transportation Library Consortium, Preliminary Library Findings, Final Draft (2002).

Resources

EOS International's Q Series products:
http://www.eosintl.com/

A profile and overview of EOS products conducted by members of the research team:
http://www.coe.missouri.edu/~is334/projects/Project_LIS/vendors/eos.html

Minnesota Department of Transportation Library
http://www.dot.state.mn.us/library/mtl.html

Northwestern University Transportation Library
http://www.library.northwestern.edu/transportation/

Transportation Research Board's Transportation Research Information Services
http://199.79.179.82/sundev/search.cfm

Appendix A
Work Plan

Work Plan

Investigation Number:

Title: Library Systems Development at the Research, Development and Technology (RDT) Division of the Missouri Department of Transportation

Research Agency: University of Missouri-Columbia

Principal Investigators: Charles J. Nemmers, P.E., Director, Transportation Infrastructure Center, Department of Civil and Environmental Engineering, College of Engineering and Dr. Thomas R. Kochtanek, Associate Professor in the School of Information Science and Learning Technologies, College of Education.

Objective: To provide expertise in support of the RDT decision to sub-license Q-Series library software applications from the Information Systems (IS) Division of the Missouri Department of Transportation. The challenge is to develop the RDT Library in an open fashion that will support expansion to other departments within MoDOT.

Specific tasks include:

- Make continuing recommendations and expand use of the EOS Q-Series application functions.
- Convert original local collection and new items through copy and original cataloging.
- In cooperation with MoDOT personnel, make recommendations for external document delivery and support solutions.
- In cooperation with MoDOT personnel, support the design and development of a digital web site and databases representing the selected portions of the "library collection", including bibliographic records, housed within RDT.
- Research and recommend document delivery solutions for RDT end users accessing documents using the Q-Series application.

Background and Significance of Work:

This year two action research project will focus on continued cataloging of the

RDT Library collection holdings, including identification of the subsets of the collection

that are candidates for bibliographic conversion as input directly into the Q-Series library

application, those that will be copy cataloged from the OCLC World Cat database, and

those that will require specialized external cataloging by a third party outside MoDOT RDT. After these sub sets are identified by qualified library science persons, they can be assigned for cataloging to the appropriate body so that shared resources are used in the most effective manner.

Similar to this is a focus on development of shared resources, and the establishing of effective protocols by library science consultants for the use of these shared services that will best contribute to the continued growth of MoDOT as a leader in the transportation research industry.

These decisions cover a diverse range of library science development processes and are based upon information taken from the study of objects in the collection, the information system requirements of the RDT facility as it relates to the internal needs of MoDOT users, and the requirements of providing assistance to DOT and university researchers outside the RDT facility.

Because these tasks cover diverse areas of information and library science, these efforts are most effective when conducted by a team or group of individuals with varying skills including technical and operational services, planning and facility management, and collection access and development persons. In addition, requirements also include experience in implementing, sustaining, and scaling information systems designed to meet the needs and challenges of research driven businesses and organizations. These deep challenges and promise,

> "share common threads, including the obvious themes of rapid technological change and how such changes influence the needs and expectations of researchers and users. Perhaps the deeper themes, however, involve the social and institutional changes necessary to effect the transition from traditional

resources, tools and services for support of scholarship to the digital, distributed, seamless environments that will be necessary in the future (OCLC 2002).

In this fabric is a framework based need for task forces designated to implement and continue the facilitation between the traditional and non-traditional realms of transportation research. The transportation library system then becomes not only the hub of transportation research past and future, but a symbol of MoDOT's continued leadership in managing the requirements of technical change.

Action Plan:

The research team will first investigate the existing implementation of the EOS integrated library systems applications within the Information Systems Division. The processing needs and service applications of the RDT Library, as established in the previous study document entitled "Research, Development and Technology Library System Functional Requirements", will be articulated in light of new developments and choices in software vendors (EOS, Int'l).Procedures for creating and entering bibliographic records organized using national standards will be created.

The MU Research Team will need to have dial-in access to the Q-Series Cataloging Module in order to input bibliographic records from Columbia. Training of the MoDOT media conversion group will be conducted, facilitating identification of bibliographic records using the OCLC World Cat database.

Records will be created that are capable of being shared across multiple platforms, both within MoDOT and in accordance with emerging national DOT standards.

Literature Search:

EOS International's Q Series products can be viewed at: http://www.eosintl.com/

A profile and overview of EOS products conducted by members of the research team can also be viewed at:
http://www.coe.missouri.edu/~is334/projects/Project_LIS/vendors/eos.html

"Research, Development and Technology Library System Functional Requirements", prepared by Lee Ann Kell, Client Relations Liaison, dated March 8, 2000.

RDT Library System Development, RDT 03-012, RI 98-026
Year One Report, September 2003

Method of Implementation:

The MU Research Team, in conjunction with appropriate MoDOT representatives, will determine tasks to be performed in accord with the stated objectives.

Anticipated Benefits:

MoDOT's RDT library will be part of an integrated system compatible with national libraries and MoDOT information systems so as to provide easy and ready access to RDT documents statewide.

MoDOT's Information Systems resources will more fully utilized by providing the linkages between complementary systems and users.

The foundations of a Web-based library system will be put into place so to better support the RDT staff in connecting end users with requested resources.

MoDOT, RDT, and MU will be in a position that the University can provide long-term support, maintenance and upgrades for information system products.

Graduates of MU's program will be excellent candidates for organizing information selected from the RDT collection, to be converted to the Q-Series databases. They can also serve as Information Scouts in identifying relevant materials that might be available through external sources, including licensed databases and quality Web-based resources.

State development and training will add to the knowledge base of the in house RDT professionals with regard to accessing digital information resources and best use of the Q-Series applications.

Staffing – the MU Research Team:

Project Co-Investigators:

Charles J. Nemmers, P.E., Director, Transportation Infrastructure Center, Department of Civil and Environmental Engineering, College of Engineering, University of Missouri-Columbia.

Dr. Tom Kochtanek, Associate Professor, School of Information Science and Learning Technologies, College of Education, University of Missouri-Columbia.

Student support positions (to assist and carry out the plan as described):

(2) Graduate Research Assistants, SISLT, 25% for twelve months

Research Assistant, College of Engineering, 25% for twelve months

Q380 SISLT Practicum students (approx. 320 hours at no cost)

Equipment:

The server housing the EOSi Q-Series applications will be the sole source for storing bibliographic records. Members of the research team will work with existing MoDOT technologies to develop conversion procedures and conduct training exercises. The MU Research Team will require remote dial-in access from Columbia to the Q-Series server, for purpose of searching and inputting cataloging records linked to primary source documents.

Recap of Deliverables:

The MU Research Team throughout year two will provide expertise and personnel in support of the RDT decision to sub-license the Q-Series library software applications. It is expected that the main focus of year two will be to continue the conversion of RDT Library holdings to machine readable format. Subsequent efforts will be directed towards providing end user services based on that database of converted documents, and through the development of shared partnerships.

As the Work Plan develops during the year, Co-Investigators will document the investigation phase, the development phase, the laboratory phase, along with a Report of Findings. These findings can be shared with other DOT agencies as they seek to solutions to their particular processing and service needs.

Appendix B

This document comprises guidelines for circulation policies at the RDT Library facility. The Circulation policies detail stipulations regarding the borrowing of materials from the library, including interlibrary loan policies.

RDT Library Circulation Policy

Eligibility

The RDT Library collection has been developed to serve the research needs of the Research, Development and Technology unit and other MoDOT employees. Mate rials circulate to:

- Employees of RDT unit
- Employees of Headquarters and other districts of MoDOT
- Faculty, staff and students of University of Missouri-Columbia and University of Missouri-Rolla
- All member libraries of MTKN
- Other institutions through interlibrary loans and cooperative agreements

Loan Periods

Standard: Most materials, including books, reports, journals, CD-ROMs, and videos, circulate for **One month**. RDT employees have the option of borrowing standard loan materials for no more than **Four months**.

Short-term: Magazines for 10 days.

Renewals
Always include the item IDs (bar codes) when renewing publications. Item(s) may be renewed on or before the due date by:

- Phone: 573-526-4326

- Email: liaoc1@mail.modot.state.mo.us

- In person

All materials may be renewed as needed, but recalled item(s) must be returned promptly if recalled for another patron.

- Recalls: Recalls may be initiated after seven days. The library will ask the initial borrower to return the item for use by another person. Priority for use of materials will be given to RDT employees.

- Holds: A hold may be placed on any item out on loan. A book on hold cannot be renewed, and library staff will notify the patron requesting the hold when the item has been returned and is available.

Overdue Materials:

Overdue notices will be sent for materials that are more than one month overdue.

Telephone requests for return of high-demand items or items for which there is a waiting list will be made as deemed necessary by the library staff.

Fines:

No fines are charged for overdue books.

Lost Materials:

Borrowers who lose library materials are required to acquire a replacement for the item lost at their own expense. The library cannot accept money in payment for lost materials.

Privacy of Records

In accordance with state law, circulation records are kept confidential. Library employees will access circulation records only in fulfillment of work duties.

Appendix C

This document outlines the Circulation procedures at the library, detailing the processes required for the circulation of materials during day to day to operations..

Library Circulation Procedures

Auto Check-out Procedures (for resources with barcodes):

1. Bring the publications to the library staff
2. Select the name in the patron list (Those who cannot be found in the list will be asked to provide some required contact information and be added to the list.)
3. Scan the bar codes
4. The borrowing period could be changed according to patron's requests.
5. If the library staff is absent, email patron's name, titles, and the bar codes of the publications to liaoc1@mail.modot.state.mo.us

Auto Check-in Procedures (for resources with barcodes):

1. Bring the publications to the library staff
2. Scan the bar codes
3. If the library staff is absent, drop the publications to the "Auto Check-in" box.
   (* Please **don't shelve** the publications.)

Manual Check-out Procedures (for resources without barcodes):

1. Fill the manual checkout form except the "check-in date"

Manual Check-in Procedures (for resources without barcodes):

1. Fill the check-in date on the manual checkout form
2. Drop the publications to the "Manual Check-in" box
   (* Please **don't shelve** the publications).