One-to-One Customization of Library Patron Relationships Using Web-Based Networks and Information Technologies on the College or University Campus

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[Abstract]

One-to-One relationship management is a strategy that focuses on the academic library as a point of service. It provides the librarian with a methodology for utilizing currently available technology, which when combined with transaction information that the librarian collects from each differentiated patron interactions, enables the library to offer a range of individual customized services for its best patrons. This strategy is facilitated by the availability of low-cost high-speed computers and sophisticated telecommunication networks. This paper explores the contribution that affordable technology makes to the academic library's homepage rapidly becoming a new frontier platform for the promotion, delivery, and utilization of academic resources and services. In addition, the following issues are discussed: opportunities created by the enlarged cyber collections with the integration of the traditional collections; the role of privacy to insure patron participation; One-to-One relationship management strategy steps of patron identification, differentiation, interaction, and customization; and the practical application of customization in the academic library environment.

Overview and Purpose

A library functions in at least two capacities. The first is its role as center for collections, and the second is its role as a service center. As a place, the library houses resource collections that its staff develops, organizes, and preserves. The library's assets, which have been developed carefully over time to meet the library's mission, form an institution's educational infrastructure for students and scholars. As a service center, the library's patrons obtain access to local and remote collections, obtain librarian services for collection mediation, and patrons have the option of availing themselves to instructional services in the use of collection resources.

Academic libraries have a long history as adopters of technology to enhance the patron's use of informational resources. Collection access and technology in combination are catalysts that enhance learning experiences and improve learning outcomes. The availability of low-cost high speed computers and sophisticated telecommunication networks make it possible for today's library to offer an array of Internet web-based services that harness the transforming nature of electronic publication. This affordable technology is a comprehensive and interactive source of content.

George Machovec's "Electronic Journal Market Overview - - 1997" presents an interesting and informative overview of the electronic journal. Professor William Saffady provides an in-depth study in his "Availability and Cost of Web-Based Bibliographic Search Services." In the first part, he provides a comprehensive survey of web-based bibliographic search services. In the second part, he examines the costs associated with web-based bibliographic searching, including start-up costs, operating costs, and a competitive analysis. This study is instructive since it addresses cost reduction, performance issues, and it reviews fixed and variable cost components and provides different pricing models that are employed by web-based search services.

Web-based bibliographic databases are information utilities that increasingly provide the librarian with the opportunity, in consultation with classroom faculty, to alter the fundamental composition of their traditional collections of books and journals. The resulting transitional shift from traditional resource collections to an enlarged cyber
environment of creatively managed and integrated digital and media resources represents the beginning of major changes in the way librarians promote, utilize, and deliver services. Already, similar implications are being seen for collection development and management. The acceptance and widespread use of Internet web-based academic resources delivered through the library’s homepage will likely accelerate a metamorphosis of the nature of literature access, learning opportunities, learning outcomes, and research. The innovation represented by web-based bibliographic utilities, coupled with advances in telecommunications technology, will extend this transformation across the library’s value chain of activities required for librarians to design, develop, produce, market, and deliver a range of library products and services to its patrons.

The web-based availability of sophisticated collections of academic resources has equalized access to information for students and scholars alike. The academic databases provided at one institution are likely the same as those provided at another. Since these products are web-based and distributed globally, academic collections featuring full-text journals and reference works allow the librarian to acquire and provide their patrons with a breadth and depth of resources formerly not affordable except at the largest libraries. The availability of these collections allows the librarian to shift collection focus from storage to access. This focus redirection allows the librarian to reframe the library from a supply-driven (demand-push) environment, where resources are acquired just-in-case someone may want to use them, to a service characterized by a demand-driven (demand-pull) just-in-time and just-for-you based emphasis. This realignment is possible because cyber products and their use are not dependent upon physical shelf space; rather, their use is a matter of computer equipment capability, accessibility, and funding.

Patron service has become the librarian's major new role as a clarion call in today's access-centered environment. For students, this focus is on collection mediation and instruction. Specifically, the librarian helps students to acquire information that is directly related to course work, facilitates the student's opportunities to explore the world of knowledge, and helps students to acquire and develop skills and capabilities that may be applicable in the student's postgraduate life. In providing library services for classroom faculty, the librarian's focus is to help them to pursue, investigate, and create knowledge as they navigate in vast complex networks and databases. In today's continuously changing library environment, technology has become a medium of relationships for the librarian to manage in providing patron services.

The purpose of this paper is to discuss the application of One-to-One relationship management in the college and university library environment. One-to-One relationship management is a strategy whereby a service provider adapts customization service patterns (personalization) to meet the needs of patrons (customers) on the basis of data that the provider acquires from the information seeking behaviors of the patron. The implementation of this strategy emphasizes four steps: patron identification, differentiation, interaction, and customization of products and services based on what is known about individual patrons. One-to-One relationship management provides the librarian with a strategy for utilizing currently available technology to offer a range of individual customized services for patrons. It focuses on the library as a point of service.

**The Role of Privacy in One-to-One Relationship Management**

The application of One-to-One relationship management begins with a discussion of privacy. In understanding its importance, the librarian is in a
position to develop the One-to-One learning relationships that are necessary to insure open feedback. The issues and concerns of privacy and its protection are not new. However, the emergence of global networks that connect large numbers of people, has focused interest on the topic. Today, privacy is regarded as one of several critical issues that face the continued growth of the Internet. Readers who are interested in the topic of privacy will find the bibliography developed by the Electronic Privacy Information Center, titled "EPIC Online Guide to Privacy Resources," to be informative and extensive.

Creating a trust infrastructure is a critically important undertaking. Identification and general agreement about the elements that constitute fair information practice for the information rights of individuals is revealed in the documents of four national and international organizations. These organizations are: (a) The European Commission: Media, Information Society, and Data Protection, (b) The National Telecommunications and Information Administration (NTIA), an agency attached to the Executive Branch of the U.S. Federal Government, (c) The Online Privacy Alliance, and (d) The Organization for Economic Cooperation and Development (OECD). Points of agreement among these organizations are the following:

- Disclosure, which provides the person with clear notice about what personal information is sought and how it will be used;
- Choice, which gives the person the ability to decide which secondary usages, if any, they will allow for the use of their personal information;
- Access, which provides the individual with assurance that he/she can access, correct, manage, and remove any personal information that is maintained about him/her;
- Security, which provides the person with assurance that all reasonable methods to protect the person's personal information from damage or theft will be used;
- Enforcement, which provides the person with assurance that the organization collecting the information subscribes to, and is subject to, appropriate and independent regulations which protect the person's rights in any case of dispute resolution.

Of course, there are a large number of additional points at the forefront of this topic for which there is not yet agreement. Some of these are the following:

- Collectors should make available a privacy statement that is easy to find on the host's website;
- It should be easy for individuals to obtain access to their own data; and
- Patrons should not be charged a fee for privacy.

Building trust is essential for the successful development of a One-to-One relationship strategy. Clear unambiguous statements about information practices and the formulating of a privacy procedure are now easier because of the existence of independent trust-assurance organizations, such as TRUSTe and the Better Business Bureau. TRUSTe, for example, has developed a wizard that generates a privacy policy. A similar tool is available from the Direct Marketing Association (Goldman, 1998). The World Wide Web Consortium's (W3C) Platform for Privacy Preferences Project (P3P) provides a framework for informed online interactions, with the wider objective to position people in control of their personal information "... to make informed decisions regarding their Web experience and their ability to control the use of their information."

**The Concept of One-to-One Library Services**

The library of my high school was customized to meet the individual needs of students. Most readers
can identify a classroom teacher, counselor, librarian, or some other important person from high school who made a significant difference in the reader's life. For me, this person was my high school librarian. She knew almost all of the students, knew what classes we were taking, and she knew the lesson plans and resource requirements of the faculty. From talking with the other teachers, she knew my grades and was skilled at gauging my strengths and abilities. She talked and interacted with us, surveying our interests and recommending reading and study material in the collection that matched our needs and interests. In contrast, today's college or university librarian, with large numbers of undifferentiated library patrons, has limited opportunities for One-to-One customization of library materials and services to individual students.

Today's availability of reliable inexpensive technology allows organizations to utilize the methods of my high school librarian. In real-time, software identifies, tracks, and interacts with each individual customer. The organization has this data available for analysis. Findings, which can be thought of as intelligence, can be applied to reconfigure the library's products and services to meet individual customer needs. An example of this can be found in the operation of Amazon.com, the online bookseller. This firm employs software to identify the categories and types of books that its customers purchase. This intelligence is used for various purposes, including suggesting other books to clients that were ordered by customers with similar preferences. Following the lead of Amazon.com, many businesses are implementing information technologies that win customer loyalty by personalizing their offerings, customer by customer.

Using technology such as databases and web-based technologies, libraries can utilize the methods of my high school librarian. They can survey students and faculty to learn their interests, collect information from other teachers (business units) and lending records (databases), determine student (patron or customer) needs from personal discussions (surveys) and course schedules (business actions). College and university libraries can also make use of these information technologies to learn from individual patrons methods to better customize the library's acquisitions and services.

Knowing library patrons well enough to individually customize library services encompasses four questions (Peppers, 1999):

- How well can the library individually identify its patrons?
- How well can library differentiate its patrons based on its needs and the patron's value to the library?
- How well does the library interact with its patrons?
- How well does the library customize its products and services based on what it knows about its patrons?

Owing to the knowledge base of my high school librarian who was described earlier, the library of my youth was customized to meet the individual needs of students. She could identify the patrons at each library interaction. She recognized me personally and remembered my needs and preferences. She could differentiate patrons one from the other since she knew which students were valued for academic achievement, community service, and sports contributions. My librarian would interact with me by talking and learning about my interests. After I read a book, she asked me for my appraisal and remembered my feedback. She would customize library products and services by remembering the individual needs of all the students and she used this information with classroom goal information gathered from her interactions with teachers and
school administration. In this way, she decided what resources to add to the collection and how best to organize, display, and manage the collection and services.

Before the widespread availability of low-cost high-speed information technology, college and university librarians did not have a cost-effective tool to allow them to offer customization of services to a large patron population. With today's affordable technology, librarians can achieve One-to-One customization of the type provided by my high school librarian.

Developing a One-to-One relationship model entails an understanding of the possibilities gained through uniquely identifying patrons, differentiating patrons and focusing on the most valuable interactions, interacting with patrons to deepen knowledge of patron needs with each library interaction, and customizing products and services to meet each individual patron's needs.

**Uniquely Identifying the Library Patron**

The first step to progress to One-to-One relationship management is to uniquely identify the library patrons served. Patron identification is not only by name, major, and class standing, but also by individual habits, needs, and service preferences. For example, when both paper and electronic journals are available, which does the patron prefer? Does the patron prefer to access electronic resources physically in person at the library or remotely through the campus network from their home, office, computer lab, classroom, or dormitory? Is the speed of the person's networked connection related to the type of electronic material desired? Does the person access electronic library resources at hours when the library is otherwise closed?

To gather this type of information, many libraries use a login/password, but this alone does not provide sufficient information when the same patron uses different machines or when the same login/password is shared by multiple patrons. In addition to using cookies, other mechanisms to gather and organize patron information include customer databases, customer feedback, interactive tracking, and online profile/registration. The reader can find useful information on cookies by reading Bowen (1997), Clark (1999), Crombie (1999), Kentworthy (1998), Kriston (1999), Sikorski (1998), and the piece by Web Management Strategies (1997).

For example, interactive tracking allows web servers to log patron site activity. A typical product with this functionality is Guest Track (see http://www.guesttrack.com), which allows the librarian to track a particular patron's activity. "The site can present personalized information based on stored user-tracking information based on previous site visits in a real-time manner where information is personalized on-the-fly as the user interacts with the site." (Allen, 1998). With a selected combination of functions and features of various mechanisms, Web-based personalization or customization of information services is not only conceptually attractive, but it is also practical.

**Differentiate Patrons and Focus on the Most Valuable Interactions**

Colleges and universities have students who are considered to be more valuable than others, as evidenced by scholarships, honor students, teaching assistantships, fellowships, and other incentives offered to high scholastic achievers. Colleges and universities also differentiate their teaching faculty. For example, the most valuable faculty rise through the tenured ranks based on their academic performance. In contrast, the academic library has not been quick to differentiate its patrons except by category of users and in a generally equal manner. In One-to-One relationship management, the library
needs to recognize and copy its parent institution's reality and provide specialized services based on the value of the patron to the college or university.

Who are the library's most valuable patrons? Pareto's Rule, also known as the 80/20 Rule, expresses the idea of "the vital few" and "the trivial many." (Hafer, 1998, p. 153). The first step in One-to-One relationship management is build a relationship with the most valuable patrons and then extending it to an ever-increasing portion of the patron base. This step helps the librarian to understand better what the library's best customers want and need. The library can then use this intelligence at the micro (personal) and macro (aggregated) level to expand and improve its products and services.

Special identifiers in a cookie, or data captured in a database, can alert the librarian that a request is from a most valuable patron so that the request can be leapfrogged in the queue to be handled in a specialized and personalized way. Librarians routinely do this when a request is received over the telephone from an official (trustee, president, vice-president, provost, dean, or key faculty member). Considering high-status persons as one special clientele group, examples of possible others, owing to their visibility within the college or university, may be the cohort members of distance learning classes or the participants in various executive study programs. On their customized library homepage, these persons may have a button, which asks a reference librarian to call or contact them at a chosen time and by a preferred contact medium. Insights achieved from studying the librarian's interactions with the most valuable patrons can result in the librarian providing enhanced services for all patrons.

When new or advanced services are offered, the librarian should consider providing earliest access of these to the library's most valuable patrons.

As affinity groups, professors and students, who are within the same academic discipline, may have more similar needs for customized library services than professors have with other professors or students with other students. From a cookie or a database check, the library's software can determine the students from the same class that are logged into the library's server at the same time. By making it known who in the class is also online, and by providing keyboard chat or voice over the Internet, distance learning students, for example, can have a sense of community and participation that has been found to be valuable to on-campus students. Free keyboard chat has been popularized by AOL, ICQ, and Yahoo!, among others. Yahoo!'s free Yahoo! Messenger supports real-time voice and messenger Internet communication.

From among the library's patrons who access the library from off campus, the library can differentiate services by the user's modem connection speed. For example, patrons with high-speed connections can be offered full-motion video, while persons with mid-speed connections can be offered compressed video, and low-speed connected patrons can be offered download access to the compressed video. As more of the academic curriculum is available electronically, librarians will have increased opportunities to learn their patron’s preferences and provide services that match their patron’s needs.

**Interact and Deepen Knowledge of Patron Needs with Each Library Interaction**

By harvesting database information, the librarian can analyze and study patron needs and preferences. Patron needs and preferences that are not well understood provide the librarian with an opportunity to develop surveys targeted to meet certain patron criteria are personalized to groups that share common characteristics (Brachman, 1996).

With a library database that is rich in user specific information, each patron interaction can direct the most valuable patrons to the most effective
interactions that meet their needs. Each time a patron accesses the library, the effective use of information technology makes it more convenient for that patron. Cookie or login/password information can point to previous information entered by the patron. The advantage of this is that the user is never asked for anything more than once, especially for information that is part of the user’s identification and routinely used in interactive forms, such as interlibrary loan requests or book recommendations. Each electronic contact between the patron and the library can be structured to pick-up where the last left off.

In harvesting and analyzing data, the librarian strives to answer the question, “Are our library resources and services helping us to keep our most valuable patrons, and are the library’s collections and services making our patron’s life easier and better?” Customer feedback, in the form of interactive data, provides librarians with opportunities to build product-service bundles. These value-added services are designed and structured to help the individual patron to improve his/her academic work so that the patron will place a higher value on the library than before.

Customize Products and Services to Meet Each Individual Patrons Needs

The goal of One-to-One patron relationship management is to interact with and learn from patrons. In this way, the library can provide even more customized services that more closely meet individual patron needs. Today’s libraries deliver material that is mainly in traditional paper form or its electronic equivalent. Tomorrow’s services, however, may likely include encrypted digitized books that are delivered individually to a patron’s PC or to a digital Walkman-type recorder which is copy protected by the library to play only on that device. The stage for this possibility is set since microprocessors are beginning to include an identifier that can be used as the decryption key. The library’s future electronic reserve materials may consist of chapters from various textbooks that have been provided by different publishers and customized by the professor for individual classes or students. Book collections are already dramatically beginning to change with the distribution of electronic books, called eBooks. A new company, netLibrary (Boulder, Colorado) has launched a comprehensive digital book collection <www.netlibrary.com>. To date, their collection exceeds 8,000 titles focused in areas of reference, scholarly, and professional areas targeted to meet the demands for higher education and distance learning criteria. Electronic book collections, like full-text journal collections, allow libraries to better serve patrons by reducing or eliminating the costs associated with storage, acquisition/cataloging, replacement, loss, and maintenance.

The college and university library homepage represents a new frontier platform for the promotion, delivery, and utilization of academic library services. The continuing growth of web-based delivery of academic resources will greatly contribute to transforming the nature of information access, learning opportunities, learning outcomes, and research. Today’s innovations, and the manner in which librarian’s grasp their potential to change service paradigms, are key steps in strengthening the role of the library to provide global research resources to students and faculty.

Today’s technology has changed the library’s homepage from a static resource to a platform for the delivery of academic resources. The success of web-based delivery of academic resources is accelerating a collection shift in libraries from traditional print to electronic resources. This change harbingers a supportive environment for One-to-One relationship management. Currently available Active Server Page technology already allows librarians to provide patrons with individual library homepages.
customized according to a patron's academic profile or personalized choices. Among the libraries that offer this service are California Polytechnic State University Library, North Carolina State University Libraries, Seton Hall University Libraries, University of California Library at Los Angeles, and University of Washington Libraries (Ghaphery, 1999).

Interactive library websites can make use of both pull-technologies, characterized by the user clicking on links to pull information to the browser, and push-technologies, (sites such as www.pointcast.com), characterized by “pushing” information based on a personal user profile (such as AOL.com). Using push Web technologies, the library can send information selected on the basis of research interests, academic major, or current or scheduled courses. It may include updated course material that a professor has placed on electronic reserve for students or announcements of on-campus research talks matched to personal preferences or selected members of an academic group. Push channels are a type of electronic publication that is periodically (daily, weekly) customized to the needs and preferences of individual users. Using cookies or server logs, the providers of college or university information can track immediately the number of click-throughs (patron clicks on an announcement for more detailed information) and use this data as a measure of immediate feedback of interest level. Rather than wait to see who comes to the talk, the librarian can immediately check to see how many announcement click-throughs are recorded. The faster the librarian can learn and process the patron’s needs, the more valuable the library's services and programs will be to the patron.

Customized services can continue to automatically learn the patron’s interests. By tracking usage by major or professional discipline, the database can be analyzed to provide real-time feedback to patrons of what services have been recently used by their peer group, or a subset of their peer group. The library material used most frequently by patrons in the same major, or by patron selected criteria, may be pushed or pulled to patrons, and a simple database can keep this information automatically updated as the peer group usage pattern changes. Not only can the library customize services for its patrons, it can also feedback desirable behavior to relevant peer groups. Current information technologies allow a customization of services for students, alumni, faculty and community personalized by individual preferences within each of these groups.

Today’s information technology supports customization of library services based upon data resulting from individual interactions between the patron and library software. The opportunity for the librarian in One-to-One relationship management is to increase the library’s value to each individual patron by catering to each particular patron’s differentiated needs and interests.

**Summary of One-to-One Relationship Management in the Library**

The increasing widespread use and acceptance of web-based academic resources in the academic library environment will likely accelerate a change in the nature of information access, learning opportunities, learning outcomes, and research. Today’s college and university libraries are experiencing a transitional shift in their traditional collections of books and journals to an enlarged environment that likely will become dominated by a growing collection of digital and media resources. This transformation presents librarians with a strategic inflection point, a time characterized by Intel’s CEO Andrew S. Grove as a “full-scale change in the way business is conducted.” (Grove, 1996)
This groundshift in the library’s fundamental enterprise provides the librarian with an opportunity to rethink and realign the library’s value chain of activities that are required to design, develop, produce, market, and deliver library products and services. One-to-One relationship management employs currently available technology that the librarian can use to strengthen the effectiveness and role of the academic library by offering a range of customized services to a large patron-base in a cost-effective manner.

One-to-One relationship management is a four-step process:

1. The unique identification of library patrons at the micro (individuals) and macro (aggregate) levels;
2. The differentiation of patrons as a means to concentrate services on the most valuable interactions;
3. Interaction with patrons to allow the librarian to deepen their knowledge of the needs and preferences of patrons and by using the intelligence gained from each patron interaction with the library; and
4. Customization through reconfiguration of the library’s products and services to meet the individual patron’s needs.

In providing individual library patrons with targeted collections and services, librarians are able to more effectively help patrons and thereby increase the library’s value to them. The information databases, constructed from the individual patron interactions with the library, provide the librarian with a rich data resource for research and analysis in the utilization of collections and services. By quantifying library usage by selected student groupings or targeted growth areas, the librarian has an analytical method to relate library acquisition decisions to specific academic programs with the objective of improving value for its patrons.

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