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User Centric Design of Library Systems and Services in the Changing IT Era: An Overview

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*This article belongs to the **Special Issue "Modern Trends in User Centric Design (UCD) of Library Services and Applications"***

Abstract Defines the User Centric Library System (UCLS) and explains the need for user centric library systems and services (UCLSSs). Argues that the design of user centric library systems are basically meant for providing quality services to the users and for their empowerment, and also for sustenance of libraries. States that the embedded librarianship and user centric libraries have some similarities in terms of librarians and users working in teams to design and develop various services and products that will better suit the users requirements. The paper explains that the Internet and Web technologies have come handy in design and delivery of the user centric library systems and services in the changing technological era. It emphasizes that all the library operations and services are largely user centric professional commitments and responsibility of librarians, whereas, some of them pertain to the professionally warranted functions for accountability of the jobs held by the librarians. The core of the library operations and services, either explicitly or implicitly are user centric and their foundations are built on Dr S.R. Ranganathan's Five Laws of Library Science. Information Technology is aiding the libraries in maintaining contact with the users in diverse ways and to maintain collaborative sharing of knowledge or information. The paper concludes that, there is a need for the LIS professionals to shift their philosophy from the 'Library Centered' approach to the 'Learner or User Centered' approach, to make the libraries relevant with the changing times.

Keywords *Library Services-Five Laws of Library Science; IT Enabled Library Services; User Centric Library Systems; Web Based Library Services*

1. Introduction

Library is the trinity of users, collections and staff, and users constitute the most important component of all the three. The primary objective of a library is to provide either documents or information needed by its users. That is, to provide right information to the right reader at the right time in a right usable form. This explicitly or implicitly indicates that 'User' is the crucial most constituent of all types of libraries, and without users the existence of libraries cannot be thought of. Further, all the library operations and services are designed and executed, aiming at the users and in fulfilling their information needs. That is, 'putting the knowledge for use'. Therefore, naturally, the user centric design of libraries and library systems becomes imperative and essential for all kinds of libraries, whether academic, public or special. The quality of libraries or the quality of library systems and services are dependent on how well they are centered on users.

Librarians have two basic obligations to fulfill. They are: 1. Professional and Social responsibility, and 2) Professional accountability. All the library processes, activities, files, records, services and products, naturally fall in to one of the above two categories, i.e., professional responsibility or professional accountability. While, the first one is aimed at fulfilling the library users' needs and requirements, the second one is aimed at maintaining and managing the records and files as a means of accountability to the authorities and funding agencies, who provide finances or budget for running the libraries. However, the library services of all types of libraries are planned and designed focusing around the library users. Of course, some services are in direct contact with the users and felt easily by the users, whereas, some others performed behind the screen in libraries are not perceived directly by the users.

Libraries have been providing user oriented or user centric services right from their beginnings, as their very purpose is to meet the information needs of users in their respective fields of activities. Further, the user centric libraries require undertaking of two important activities which are a priori to user centric libraries. They are: 1. Identification of user needs, their information seeking behavior, and 2.User orientation, and offering Information Literacy (IL) to optimally make use of the resources, services and products of the libraries.

2. Objectives & Methods

The purpose of the present paper is to sensitize and create understanding on the librarians and information professionals who have been participating in the design and development of library systems that are aimed at users and performing all the library activities and services around the users keeping them in the central place as the essential component, to achieve the objectives of the library. It is further aimed at bringing to the knowledge of the library and information professionals that the acquisition policies, collection/resource building, library services & products are to be designed and developed keeping in view of the users of library, their information seeking behavior and information needs. Analytical and Descriptive methods are followed for this study in presenting an overview of the User Centric library design and development.

3. User Centric Libraries- Meaning/Definition

The phrase "user-centric," is synonymous for "User-centered" or "user-focused". The libraries planned/ designed around meeting the users' information needs/requirements at their best are generally considered as the 'User centric libraries'. Libraries being the social institutions and the society or people around the library (public library) constitute its users. Hence, the library has the responsibility to meet the users' information requirements. It is equally also in case of academic and special libraries, whose users are the members of the organization/institution in which the library is located. Although, user-centered design is widely supported in theory, but in practice, its conceptualization and implementation differ widely. Human Computer Interaction (HCI) specialist John Karath remarked that the phrase "user-

centered design" has no agreed-up on definition. The meaning of user-centered design is extraordinarily diverse, and depends greatly on the discipline, back-ground, and research interests of its proponents.

Wikipedia defines user Centered design as "a process in which the needs, wants, and limitations of end users of a product are given extensive attention at each stage of the design process". Further, the user centered design process includes the phases or components such as, user requirement analysis; conceptual design; design and implementation; usability evaluation, launch and maintenance. The user centered design is presented below in a graphical way.
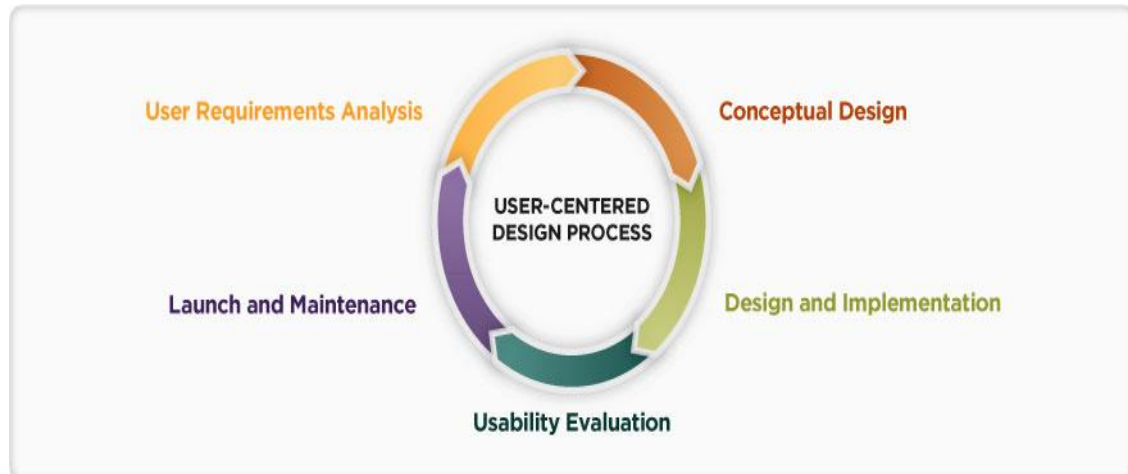

Figure 1: *User-centred Design Process*
(Source: http://usability.msu.edu/)

Therefore, for a user centric design of library systems, it is a priori and essential to find out the users requirements, their use attitude, behavior, use pattern and their satisfaction with the information products and services of the libraries. And once a design is made, it needs to be tested or evaluated to find out whether it is meeting the expected objectives and satisfaction of the users, and based on the feedback, redesign of the library system can be planned to make it effective.

A similar definition for User centric design is offered by a software company, Apple Inc., as 'When you stay focused on your users throughout the design process, you have the best chance of delivering a product that meets their needs. After you determine who your target audience is and what, precisely, your app helps them do, it works well to use that knowledge as a tool to shape every design decision". The Guidelines offered by the Apple Inc., for a user centric design are precisely:

1. Know your audience / user;
2. Analyze user tasks;
3. Build Prototypes;
4. Do Testing, and Focus on Solutions, not Features.

This definition equally suits to libraries also.

The embedded librarianship and user centric libraries have some similarities in terms of librarians working in teams with users and collaborating with each other for better and effective design and provision of information services and products. As partners with the library users, such as, faculty, researchers and students in academic libraries, or scientists or researchers in scientific and technical libraries, library services and instructional programmes that are needed can be designed and offered to the user community.

A. Advantages of User Centric Libraries

Since libraries are established with the basic purpose of serving the information needs of the users, they have to naturally function keeping the users as the central or focal point and to perform all their activities and services around them. The quality libraries and library services are none other than those that meet the information requirements of their users with highest level of satisfaction. Thus, delivering better and quality services is possible only when they are user centric. The justification for the budgets spent, the resources and infrastructure procured by the libraries is possible only when they meet the user' requirements. The user' interests and the interests of libraries have to go together in planning and designing of all the library policies, practices as well as services.

Dr. Ranganathan (2006) states that user is the 'king and queen of the library'. Similarly, various service oriented organizations, such as banks, consider customer as their God, and hence treat the customer is utmost important. Therefore, services of organizations are primarily aimed at satisfying the customer. The library collaborative (re)design approach focus beyond "library centric" thinking that only advances librarians' points of view on "what is the best for users". Whereas, Learner-centered and highly interactive, collaborative design is both a philosophy and a process in which the needs, wants and limitations of end users play a central role at each stage of the design process. (Somerville and Collins, 2008).

4. Review of Literature

A brief review of the literature on user centric libraries is presented below. Morris (1994), states that the concept of user-centered library services is considered as an antidote to a systems-centered approach. The author emphasizes that there is a need for a theoretical and conceptual underpinning to guide the development of a user-centered service. Morris also states that Dervin and others have provided some insights into the nature of information and information seeking that can serve as a conceptual base for understanding how our thinking has to change in order to develop user-centered services. This study suggests how an altered understanding of information can provide the basis for rethinking and potentially redesigning the library's mission, the provision of traditional services, the design of systems, and the measurement of services. Concepts from psychology are suggested as a tool for increasing the understanding of how to design user-centered services.

According to Schulze (2001), the information professionals largely agree that user-centered design contributes to high quality information systems. However, there is no general agreement about how to define the term "user-centered design," or how best to implement user-centered design strategies in the development of systems and services. Schulze proposes that a general definition of user centered design drawn from the literature of Human-Computer Interaction (HCI) could serve as a basic framework for information system design and support interdisciplinary work and also describes some useful methods of implementing this framework in the development of user-centered information systems.

Williams (2002), states that "our (library) product is the user". We did not start our planning with how service will be delivered. We started with how service will be experienced by the user. That drives everything library's user centric service links library effectiveness to how patrons rate their visit; brings backroom staff on to the floor to maximize the personal touch, promotes the multisensory learning environment'.

Arora (2008) explains that Library 2.0 encompasses a range of new and contemporary technological tools and techniques that are used for evolving collaborative environment required for Library 2.0 and in keeping the users well connected with the libraries as well as designing user centric information systems. These tools and techniques are broadly grouped into five categories, i.e. i) Synchronous Communication: Instant messaging; ii) Content Delivery: RSS Feed, HTML Feed, Streaming Media,

Podcasting, Vodcasting and SMS Enquiry Services; iii) Collaborative Publishing Tools: Blogs and Wikis; iv) Collaborative Service Platforms: Social Networks, Tagging, Social Bookmarking Services; and v) Hybrid Applications, Programs and Programming Tools: Mashups, AJAX, API and Toolbar. These tools and techniques are useful for libraries in providing new services and making existing services available in new and interesting ways. Implementation of some of these tools and techniques are likely to improve reputation and standing of libraries in the community. Some of them may successfully attract new patrons to the library, others may help to retain existing members or make libraries even more important as centres of the culture and history of their cities and academic institutions.

Somerville and Collins (2008) state that 'Information commons' were introduced into libraries in the early 1990s. Now universities are building 'library learning commons' and 'campus learning spaces'. The authors present a participatory library (re)design approach for collaborative planning "for and with" faculty teachers, student learners, and campus stakeholders. Collaborative design (co-design) employs user-centric investigations to produce products, applications, and environments aimed at advancing learning, sustaining communication, and building relationships. Examples from California Polytechnic State University and San José´ State University in California, USA, suggest the efficacy of this inclusive, learner-centered (re)design approach for library facilities, services, and systems. Inviting and enabling user input from the beginning, offers a fruitful planning approach in which campus librarians, stakeholders, and beneficiaries "learn their way" to appropriate library (re)design decisions. Also, user involvement in information gathering and interpretation activities initiates the interactive relationships necessary for continuous improvement. Collaborative design (co-design) yields sustained interaction with user beneficiaries and campus stakeholders. It changes how library staff members think and what they think about, concurrent with enhancing libraries' appeal and value.

Dahibhate, Patil, Dhawle and Mugde (2009) states that the primary role of the library and library professionals is to acquire the needed quality information resources that suits to the needs of the users. There is a need to provide user based or user centric services to satisfy the user requirements. The authors discuss about the user-based services and also the skills required for managing such libraries. They conclude that the technology can be used to provide more effective user centric services including induction to users, training with multimedia applications and also provide teaching and learning support to users, self-ordering documents, electronic publication, remote log in, FAQ services, etc.

Pianos (2010), states that virtual libraries try to combine traditional library services with new document types and services. The first generation of virtual libraries mostly tried to offer services based on a library-centric view of information retrieval systems. New virtual libraries try to concentrate on user's needs, but this is often easier said than done. Restrictions like copyright laws, technical limitations and the like often make it difficult to meet user requirements. A number of studies documented these needs: easy-to-use, comprehensive yet focused search, and easy access to print and online documents, subject specific, yet not too restricted to specific areas.

Bowler, et al. (2011) surveyed the landscape of user-centered design in LIS. They explored the history of the "user-centered paradigm," looking first at the historical schism between behavioral science and computer science, and then surveying some of the methods of user-centered design. Present examples of technological artifacts that reflect the basic functions of information systems—artifacts designed to collect, organize, and retrieve information—as a way to present some of the difficulties and opportunities that surround the creations of user-centered design. Specifically, it deals with how user-centered design relates to personal collections, social bookmarking, finding aids, Web interface design, information architecture, visualization systems, and personalization and adaptive search. The article then steps back and looks at design through the wider lens of values, asking the question, how are users represented (or misrepresented) through cultural, ethical, and political forces that influence information system design? Concludes with a summary of the major issues of current state of user-centered design and from this extracts some key lessons vis-à-vis research and teaching in LIS.

Swain and Swain (2012) State that with the proliferation of ICTs, the traditional library services have been considerably renovated, redesigned and refurnished in a way that the users no longer have to rely on consultation of physical documents at a certain place and time. Presently, the library services and services are extensively made user-centric using the technologies such as, Web 2.0, Lib 2.0, etc.

Bhatti and Hanif (2013) in their study on the faculty members of social science observed that the successful library services depend mainly on satisfaction level of its users with the relevant library collection, user-centric library services and library staffs' supportive attitude. Their study was based on survey method using questionnaire. It aimed at studying the types of material used for meeting academic and research needs, purposes of seeking information, respondent's satisfaction with library services, satisfaction with library collection, journals subscription, preferred format of information, problems faced during information search, satisfaction with the attitude of the library and opening hours of library. They made some recommendations to improve library usage frequency and satisfaction by the users.

Mazzocchi (2014) states that Blogs are among the first Web 2.0 tools that libraries have used to communicate with their users. In recent years, however, they seem to have lost their role in favour of other tools such as social networks, especially Facebook. This article analyses the downward trend that library blogs (especially academic library blogs) are experiencing in relation to the explosion of social networks. The relationship between blogs and social networks as library's communication tools is also analysed.

Eke, Omekwu and Odoh (2014) observe that Social networking sites are fast becoming very popular means of both interpersonal and public communication in Nigeria. Social networking sites are modern interactive communication channels through which people connect to one another, share ideas, experiences, pictures, messages and information of interest.

5. Five Laws of Library Science and User Centricity

Dr S R Ranganathan's '*Five Laws of Library Science*' -- the Bible and guiding spirit of libraries, emphasizes on user and the need for user centric design and development of libraries. All the Five Laws of Library Science, either explicitly or implicitly reveal the importance of users and user centric services. Let us re-look into the Five Laws as to how they focus on users and user centric libraries. The First Law 'Books are for use' (**by the readers/users of the library**). That is, all library resources and document collections are acquired keeping in view that they are required by the readers and hence can be put for use, but not for mere preservation or showcasing. Ranganathan states that "existence of books is justified only by the extent to which the library books are used by readers. Library is a collection of books kept for use". The Second Law 'Every Reader his/her book' in other words "Books for all". The approach and emphasis is from the side of the users of libraries. It is stated in other words as, 'Education for all', irrespective of men or women, urban or rural people, children or adults, normal or abnormal people. That is, every user visiting the library or every member of the library should find his or her required book(s) in the library. This requires that the libraries conduct user surveys/user studies regularly to find their information requirements and to acquire the collections or information resources according to the user requirements to fulfill the second law of library science, 'every reader his or her book'. The Third Law 'Every book it's Reader' emphasizes that every document contained in the library is just not for the purpose of preservation but it is aimed at its reader. Therefore, the document selection, and all the methods and techniques of organization of document collections should support the user in finding the documents of their concern with ease and comfort. The Fourth Law 'Save the time of the User' necessitates the libraries have to organize all the collections/resources, services and products in such a way that the users find their information without any time delays and orienting them to find their information as quickly and as conveniently by saving their time, as users time saving is of crucial importance to organization and management of library operations and services. The Fourth Law is completely oriented around the users and in economizing the users' time. The Fifth Law 'Library is a

growing organism' has bigger and comprehensive approach to library organization. Ranganathan states that growing organism shall only survive. The Fifth Law visualizes library as a living creature with growing users, library resources, infrastructures and library staff, etc. As time goes on, unlike other organizations libraries maintain direct interaction and collaboration with the users/customers of the organization. It can clearly be understood from the above that out of all the Five Laws, the first four Laws are directly emphasizing on the users/readers of libraries, whereas the Fifth Law inherently or implicitly speaks on users and various others such as library staff, resources, infrastructure and services so on.

6. Library Collection Building and User Centricity

The mission of libraries is to deliver effective and timely information to the users. This is also stated as 'right information to the right reader at the right time in a right usable form'. Libraries function with the graphic material and of course, in the present times with the digital/e-resources and databases. The acquisition policies and collection/resource building of the libraries are essentially to meet the present and the future needs of the users. Here, the First Law of Library Science 'Books are for Use' stands as guiding principle in collection building in libraries. Any document collection that is procured by libraries has to be in the user interest only and needs to be put to use. Therefore, the library acquisition policies are formulated and the collections are acquired and organized accordingly, keeping in view of the users' information needs. And for identifying the information needs of the users and information seeking behavior, libraries conduct user surveys regularly and obtain the feedback on the library services and products for their improvement.

7. IT Enabled Library Services and User Centricity

All the library services and methods of organizing resources are ultimately for aiding the users of the libraries. With the changing times and changing user needs, libraries have been inventing new services to meet the information requirements of the users. The traditional and predominant services of libraries were the lending service and reference service. These two services were the most sought after services even today. Of course, with the advent of digital resources, they are termed with different nomenclature, such as, Document Delivery Service and Virtual Reference Service. These library services are directly in contact with the users to share their ideas and information. Further, all the Library services are designed either on demand or in anticipation of the users' needs. In the present times, the ICT applications have come up as boon to the libraries in outreaching, interconnecting, and collaborating with the users in planning and design of library services and products.

The libraries with physical collections and spaces have been now under transformation into virtual libraries and one of the most important library services that maintain contact with the users, the Reference Service is being transformed into Virtual Reference Service. The users now can connect with the libraries, share their opinions, put their requests for information and receive the library services and information without physically visiting the libraries. The Internet and WWW have opened up new avenues of information sharing, communication and collaboration. The Web technologies have transformed the users as authors & publishers and offered new means of sharing of information and obtaining the responses and feedback from the users. Web 2.0 and Lib 2.0 technology have been helping the libraries in the collaborative design of library systems. The Lib 2.0 is the new generation library or the modernized library capable of delivering the instant and effective information services and enables the users to interact and share the information or knowledge. (Arora, 2009).

Some of the IT enabled services that are helping the libraries in the present times, in developing contacts with the users and delivering instant information services to the users -- synchronously or asynchronously-- to share and collaborate with the libraries and to make libraries as more dynamic partners in information and knowledge sharing.

They are:

- Document Delivery Services (Digital / e-Resources)
- Sharing of Consortia based resources
- Online Database Search & Retrieval service
- E-Mail
- Blogs & Wikis
- Social Networks
- Teleconferences / Videoconferences/ Webinars
- BBS (Bulletin Board service) / Current Awareness Services
- OPACs
- Library Websites
- Discussion Forums (listserv)
- Virtual Reference Service, etc.

8. Conclusion

The library systems and services from the beginning have been designed around the users, with the basic objective of providing either documents or information needed by the users. The Bible of Library Science, the *Five Laws of Library Science* of Dr S R Ranganathan lays the utmost emphasis on users of libraries. ICTs, especially the web technologies have been playing a key role in libraries in reaching to the users where ever they are, and enabling collaboration between the libraries and their users. Library websites, e-mails and social media such as blogs, Face book, etc are the fastest growing tools in integrating the users and libraries, enabling collaboration between them. In the present times, the libraries have been radically impacted by the ICTs and resulting in the growth and development of digital/e-resources, digital libraries, Institutional repositories, automation & networking of libraries, distributed networks, consortia resources, open Access resources, databases, etc. All these changes/ developments in information resources, their organization, search and retrieval methods necessitates organizing Information Literacy and orientation programmes to users by the libraries so that the expanding e-resources and databases can better be explored and utilized by the users.

Library collection building and acquisition policies are generally formulated keeping in view of the users' information needs and information seeking behavior. For identifying the information needs of the users and their information seeking behavior, libraries have to conduct user surveys regularly and obtain the feedback on the existing library services and products for further enhancing their quality.

The ICTs have opened up new avenues of not only reaching the users and maintaining contact with them wherever they are located, but also helped in integrating the users with the libraries and allowing them to share and collaborate with the libraries to gain benefits from them. The library resources and services if found unutilized to the expected levels can be understood as the services and resources are not planned in a user centric manner, which is detrimental to the very existence of the libraries, and would result in wastage of resources, finances and staff efforts made in organizing the libraries.

It is high time for the LIS professionals to shift their philosophy and approach from the 'Library Centered' to the 'Learner or User Centered' approach to make the libraries relevant with the current time, more visible, accessible and usable by applying Internet and Web Technologies. User centric design of libraries can only remain relevant with the changing times and the changing user needs.

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