Trendy Librarians - The Quintessential Transformation

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Abstract

Changes in Technology are influencing all sectors of human activity. The need for information and access to right information is vital in the digital environment. It is hence important for librarians to shift roles from being silent custodians to spirited catalysts. The libraries and librarians must adopt the changing technology in reaching out to the user community. This paper throws light on a few Web 2.0 tools and other emerging technologies that will guide the librarians of the future. Application of these tools is sure to bring about the transformation of libraries provided the library professionals take up the challenge of equipping themselves and assume the role of embedded librarians. The paper also attempts to establish the relevance of Dr. S. R. Ranganathan in the technology dominated library scenario.

Keywords: Libraries; Virtual Libraries; Digital Libraries; Web 2.0 tools; Community hub

1. Introduction

The foundations of Librarianship are entangled in a changing information and technological environment, but the change is revolutionary. The turn of the century has brought about radical transformation in almost every field known to humankind. The Web, and more specifically the Semantic Web or Web 2.0 has shrunk the entire world to a single click. This has led to a change in the role of the Librarians too, be it academic or public to adopt new technologies in delivering timely and relevant information services. Digital resources - games or blogs or e-books or e-resources or e-learning platforms, are powerful media of connecting to the user community. The image of libraries as temples of learning, protected from the ephemeral nature of the digital age seems like a dream. Libraries are largely undergoing a major change in nomenclature and have been rechristened as *Information Centres, Knowledge Resource Centres, Learning and Research Centres and so on.*

2. Focus

Libraries are becoming bookless, wall-less, virtual and mobile. Users are transforming into customers on cloud, demanding information at a single click. Advances in technology, cuts to funding, changes in student demographics and the seemingly endless supply of information is a threat that is looming. What does this mean for librarians of the future?

- Will there be a need for librarians in the era of Google and Web 2.0?
- Will the Library and Librarian cease to exist?

The next most challenging task ahead is preparing the Librarian of the future. The word *librarian* is derived from the Latin word *libr* meaning book, so essentially a 'keeper of books'.

- Is a library even a library anymore when the etymological root of the word becomes less and less relevant?
- Are librarians still librarians when that L-word is increasingly disappearing?
- Can librarians overcome the threat of Extinction?

Unfortunately or fortunately, there is no crystal ball or an Oracle that can predict the future. This paper attempts to bring solutions to the above discussed issues and emphasize the role and status of librarians to rise sky high in the fast evolving technological society.

3. Library - An Elixir

As architectural historian James Campbell (2013), rightly points out in his book, *The Library: A World History*, a library is not just a collection of books, but also the buildings that house them. As varied and inventive as the volumes they hold, such buildings can be much more than the dusty, dark wooden shelves found in mystery stories or the catacombs of stacks in the basements of academia. From the great dome of the Library of Congress, to the white facade of the Seinajoki Library in Finland, to the ancient ruins of the library of Pergamum in modern Turkey, the architecture of a library is a symbol of its time as well as the wealth, culture and learning unique to that territory.

To thrive in the digital present and future, today's librarians should take inspiration from our ancestors and heed their mistakes.

Egypt's Great Library of Alexandria was founded somewhere around 300 B.C. and endured until possibly 270 A. D. and, according to 'Libraries in the Ancient World' by Casson (2002), its leaders did more than just store rolls of papyrus. The library thrived because of constant innovation. The library's first chief, Zenodotus, is believed to have alphabetized the collection to enhance storage and retrieval. Callimachus, who succeeded Zenodotus, carried out a bibliographical survey of all Greek writings which became an essential reference tool. Aristophanes of Byzantium was so well versed with the holdings in the facility, that when a poetry competition was staged before the king, he disqualified all the contestants save one on the ground of plagiarism and relying just on memory plucked out the papyrus rolls that proved his case. Now that is some serious library business.

The digital age warrants for some incredible innovation. A world without libraries is inconceivable. Libraries cannot afford to go completely bookless because, like endangered species, the non-digitized physical texts of the past, and the ones that are still being printed, need a protected space (Farley, 2014). The libraries exist and will continue to do so as connections between the past and future.

Libraries today are at the cusp of education, technology and community. The society and all the more the digital generation or more popularly the millennials are in need of Libraries and librarians in the increasing digital environment. Libraries are going through a renaissance, both in terms of the social infrastructure they provide and in terms of a diversification of the services and experiences they offer. In corporate environments they are playing an increasingly important role in the provision of collaborative and diverse workspaces. In communities they are evolving into hubs for education, health, entertainment and work. Libraries are encouraging people back into the physical space, through the integration of, cafes, free Wi-Fi, personal reading spaces or child care programs. In addition, the "walls" of libraries continue to expand beyond the physical space, with online resources, social media and mobile services changing how collections and services are accessed and shared while on the go. Although the technological transition is creating an identity crisis for libraries, it also paves the path to a number of incredible opportunities to connect across the globe over a palette of information sources to be explored.

Of course the libraries are ready to march hand in hand with evolving technology. The budgetary constraints continue to plague libraries and limit their ability to evolve and adapt to the much needed changes. The bureaucracy in the society too does very little to help increase funds allotted towards better functioning of libraries. Many academic libraries are unable to acquire access to digital collections such as e-books, e-journals and e-databases due to age old policies that are yet to be revised.

The Digital India Initiative launched by the Government of India in 2015 aims at connecting rural areas with high speed internet connectivity. One among the many missions is that of Digital Literacy, which will remain a tall claim, unless all

the public libraries in the rural sectors are equipped with at the minimum one computer or laptop!

Despite these shortcomings, the libraries shall continue to evolve as powerhouses of Information and knowledge. The nomenclature is no matter. For the libraries to evolve it is essential that the librarians incorporate certain skills to enhance their ability to reach out to the User community with proactive products and services.

4. Silent Custodian to Spirited Catalyst

The librarian takes greatest pride in being a custodian of the world's literary output. But the time has come now to shift gears from a silent spectator to a proactive provider. Librarians have the potential to reshape and reinvigorate the role they play in academic and public libraries. The Google is a real threat to the librarians as it provides access to a million resources at your desktop... or rather before your eyesight (Google Glass) to be precise. The biggest ammunition that librarians possess over any sort of E-Search Engines is the ability to organise in the most logical sequence the digital data of the user community. The librarians must take initiative and responsibility to kindle curiosity and imagination amongst users. They must be aware of the technologies and creatively explore new avenues of connecting with the user community.

5. Web 2.0 Tools

Web 2.0 offers a participatory, networked, interactive, and collaborative community of web users (O'Reilly, 2007). Librarians can make use of the wide range of Web 2.0 tools to reach out to the users with proactive services. Librarians can develop online services that encourage collaboration, communication and information sharing. It represents a shift from the passive experience of static "read only" web pages, Web 1.0, to the participatory experience of dynamic and interactive web pages. Some of the popular Web 2.0 tools that can be employed by the librarians in evolving as spirited catalysts are discussed further.

5.1 Blogs/ Weblogs

A blog is a type of web page that is simple to create and disseminate information. It is used as a form of online diary by millions of users. Blood (2002) identifies four major purposes of maintaining a blog: self-expression, keeping in touch, information sharing and reputation building. Blogs are very valuable as they are very simple and flexible. They encourage sharing of information and skills of writing and self-expression. The immediacy of blogging enhances the flow of information. It gives access to create a network of likeminded people and to connect with peer group. It is easy to maintain a library blog on the library homepage. Blogs can be used to promote critical and analytical thinking. The combination of individual minds empowered with social interactions can induce critical self-reflective studies. Blogging can also be used to provide instant feedbacks and reviews of new services or products introduced at the library. The user satisfaction can be measured immediately and necessary changes implicated.

While the strength of the blog is its immediacy any delay in maintaining a regular flow of messages may result in abandonment by the users. Hence it is essential the librarian give time to updating content on the library blog and monitor constantly.

5.2 Instant Messaging

Instant Messaging (IM) is a simple form of synchronous online communication, allowing computer users to communicate across a network connection. Though the primary medium is text, progressive convergence has facilitated the inclusion of audio and video messaging via IM. IM is analogous to telephoning that to e-mailing, but still less intrusive than telephones. According to Schwarz (2011), IM is a prime communication tool favoured by the young generations, who prefer to use written rather than verbal messaging systems.

There are six main types of IM software services available. Single protocol IMs allow to connect to a single network of users, enabling chat with anyone on the same network. The popular IM providers

are AOL Messenger (AIM), Google Talk (Gtalk), Windows Live Messenger and Yahoo Messenger. There are also multiple protocol IMs that allow a number of IM accounts to be accessed through one application.

5.3 Mashups

A mashup is essentially the creation of something new from parts of several separate sources in order to produce a single integrated whole. Typically, a mashup combines bits from existing websites or applications, but the term is beginning to be used more widely for a combination of information. Sample a scenario where photos/images from Flickr can be laid onto maps, denoting the location where exactly the picture was taken. Creativity is the key word of mashups, as librarians can reach out to the users, stitching together bits and pieces of information found in various forms exacted from any number of websites.

5.4 Mobile Learning

In an academic environment, wireless technology has become the order of the day, students, scholars, faculty, librarians are all connected on campus. The digital generation has access to Smart-phones and Personal Digital Assistants (PDAs) that are integrated communication devices combining telephone, computing, messaging and multimedia services. The primary strength of the mobile devices for learning is that they are used regularly and hence integration and providing services is handy. The Librarians can make use of this technology to offer anytime access to the Library products and services. Relevant, reliable and engaging learning experiences can be facilitated by innovative, personalised and well-connected library sources. The access to users at anytime from anywhere while render them loyalists of the library services. This is one of the most personalised service that can bring librarians closer to the User community.

5.5 Online Forums

Online forums are also commonly referred to as computer conferences, web forums, message boards, discussion boards, electronic discussion groups, discussion forums and bulletin boards. A forum is essentially a website composed of a number of threads. Each thread entails a discussion or conversation in the form of a series of posts written by the members. The threads are available on the forum website for further readings indefinitely until deletion by the moderator. A forum administrator has the ability to edit, delete, move or otherwise modify any thread on the forum. Unlike blogs, forums allow anyone to start a new discussion (thread) or reply to an existing thread. The moderator or administrator is able to remove messages in case of conflicts or controversies. Flexibility and convenience are paramount for the learner/user community. Online forums are accessible 24/7 are not time bound and can be used in a synchronous environment. They are more reflective in nature and encourage active participation from the user community. The librarians can create collaborative community spirit amongst all its members using the online forum, ensuring constructive criticism, motivation and innovation.

5.6 Podcasts

A podcast is an audio file which can be downloaded and listened to either on an iPod or MP3 player for mobile study or a computer or laptop for location based study. Podcasting commonly refers to 'any software and hardware combination that permits automatic downloading of audio files for listening at the user's convenience. The term podcasting is a combination of iPod (Apple Computer's portable media player) and broadcasting. Podcasting can refer to either the content of the process. Anyone with access to the Internet and the capability of playing audio files on a computer or any portable media device can listen to podcasts. Podcasts empowers students to create content and participative learning projects. The librarians can adopt this medium to prepare podcasts of special lectures, guest speeches and even student presentations made widely available

to the user community. Podcasts are very easy to create and access. Compared to text the spoken word can influence entire cognition and motivation. The libraries can use podcasts as a medium to reach out to the user community, especially in case of visually challenged users.

5.7 RSS Feeds

Really Simple Syndication (RSS) is a set of web feed formats used to publish frequently updated content such as a blog or wiki, news headlines or podcasts. The RSS feed contains a summary or full-text of the content from the associated sites. RSS helps the user community to be abreast of the latest updates in their favourite websites in an automatic manner rather than to have to check them regularly. RSS feeds could also be called as personal newspapers. RSS content is read using a feed reader or an aggregator. RSS helps to filter and organise the vast amount of information available on the web. RSS allows users to create a list of sources in an application that automatically retrieves updates, saving considerable time and effort. RSS feed is already used by many libraries in providing updated products and services. The library can offer RSS feed sharing information concerning the institution. The strength of RSS is its simplicity, flexibility and utility. One of the advantages of RSS is that it effectively nullifies spam, which is an increasing problem with E-Mails. Locating the right online sources is a cumbersome and time consuming task for the information users. The librarians must help to locate and aggregate the right online sources so as to enable access to the right information. The biggest strength of RSS feed is convenience. The users need not search for new content through a number of websites, as the RSS headline automatically flags new items. Additionally the content is displayed first as a summary description allowing users to browse through numerous items. RSS feeds bring control at the hands of end users. They are very attractive educational sources that can be easily accessed through mobile devices.

5.8 Social Bookmarking

The art of bookmarking is not new. The idea of social bookmarking sprang mainly from academic roots, with a personal desire to share links and bookmarks amongst like-minded individuals. Collaborative bookmarking has risen predominantly from the desire to collect information or knowledge from innovators, with the hope of storing and retransmitting that knowledge to other researchers whenever needed. Social bookmarking is a centralized online service which allows users to add, annotate, edit, and share bookmarks of web documents. Social bookmarking is an ideal tool for research as it allows the user to keep track of all source materials and commentaries found online. While managing the mass of information on the Internet is extremely difficult, social bookmarking is a simple was for sharing the burden. Del.icio. us. a popular social bookmarking site can save interesting websites and also add some abstract to create useful links. Again it is easy to use, convenient and like other Web 2.0 tools can be accessed from anywhere. Since there is nothing to download or install, it can be shared with the user community for reference, amusement, collaboration or any other reason on any kind of electronic device. The major drawbacks are, as it is a tag based system there is no controlled vocabulary or a standard structure. Hence the librarians can step in and try to provide a more organised bookmarking scheme to help users find the right information.

5.9 Wikis

Wikis are collaborative, web-based sites for sharing text and other resources. The significant feature of wikis is their open editing function that allows users to jointly create the resource. The information on a wiki can be edited by all users and can be controlled by allowing or denying access. The best characteristic of Wiki is that they create an environment where information is fluid and flexible, unlike in print media where it is fixed and authoritative. This medium encourages participation in the creation of content and is

constantly revised, added or modified by the users. Since it encourages active participation from the users it can be used as a medium to tailor make products and offer services as required by the users. This can be linked with other digital resources to build repositories and portfolios.

5.10 Video Clips & YouTube

YouTube provides users with the opportunity to upload their own videos and watch others in a standard format which is accessible to anyone with Internet availability. Though it was initially a way for people to share their home videos, it soon became a medium of access to large audiences. Unlike the static and limited media like the PowerPoint, Video sharing is more creative and instructive medium. It presents rich opportunities for E-Learning as a reliable and informative reference medium.

It is essential that Librarians are aware about offering services not only electronically but also making it virtually available.

5.11 Social Networking

Social networking sites (SNS) are tools whose principal aim is to establish social relationships or offer social interactions and exchange of ideas or products between or among people with common interests. The libraries and the library professionals have always been concerned about creating a good rapport with their library users. Libraries can take the opportunity of using these social networking sites to disseminate information, market services and promote new releases (Burkhardt, 2010). Libraries are taking advantage of features of many social networking sites like Twitter, LinkedIn, Ning, YouTube, Flickr, SlideShare and similar sites to improve their presence. Social networking sites like Ning, LinkedIn etc. can be used to get connect with library associations and other people like faculty, authors, historians or other sources that can help them in finding information. Academic research world shows greater affinity towards social networking sites like Google+, ResearchGate, Academia.edu and the like.

6. Emerging Technologies

A number of innovative technologies are emerging that enable the libraries to achieve their main mission of offering equality of access to information for every citizen. Only the most significant ones are discussed here.

6.1 Cloud Computing

Cloud Computing, also known as "The Cloud", is a highly scalable platform promising quick access to hardware and software over the internet, in addition to easy management and access by non-expert users. The Gartner Group defines cloud computing as "a style of computing in which massively scalable and elastic IT-enabled capabilities are delivered as a service to external customers using Internet technologies."(Goldner, 2010). The concept of cloud computing has widely enhanced the business environments and transformed the concept of data storage and resource management. Cloud Computing relies on technologies such as virtualization, programming techniques such as scalability, load balancing and optimal performance, to ensure that resources are offered quickly and easily. The library community can apply the concept of cloud computing to amplify the power of cooperation and to build a significant and unified presence on the Web.

Some of the major advantages of offering services over the cloud are:

➢ Cost reduction: The ability to increase or decrease the consumption of hardware or software resources immediately and in some cases automatically.

➢ Scalability: *Pay as you go* allowing a more efficient control of expenditures.

➢ Lower investment & reduced risk: Immediate access to the improvements in the resource proposed (hardware and software) and debugging.

➢ Support & Security: Enjoyment of the most advanced security procedures, availability and performance of providers with experience and knowledge in this type of service.

➢ Accessibility: Access to resources from any geographical point and the ability to test and evaluate resources at no cost. (Ambrust et al., 2010).

The vision is to use cloud computing to deliver library resources, services and expertise at the point of need, within user workflows and in a manner that users want and understand. It should free librarians from managing technology so they can focus on collection building, improved services and innovation. The cloud computing model will encourage libraries and their users to participate in a network. It can help create a community of libraries, thereby enabling use of information and socialize around information. It can also create a powerful, unified presence for libraries on the Web. Cloud computing in libraries is not only futuristic but also a cost effective investment.

6.2 Virtual Reality (VR)

Virtual reality is an artificial environment that is created with software and presented to the user in such a way that the user suspends belief and accepts it as a real environment. On a computer, virtual reality is primarily experienced through mainly two of the five senses: sight and sound. VR involves the use of computer technology to create a simulated, three-dimensional world that a user can manipulate and explore while feeling as if he were in that world. Scientists, theorists and engineers have designed dozens of devices and applications to achieve this goal. In the library environment virtual reality can be used to bring the library closer to the users by creating virtual tours of the library or even virtual workshops and training.

6.3 Artificial Intelligence (AI)

John McCarthy, who coined the term Artificial Intelligence in 1956, defines it as "the science and engineering of making intelligent machines." The modern definition of artificial intelligence is "the study and design of intelligent agents" where an intelligent agent is a system that perceives its environment and takes actions which maximizes

its chances of success. The term is also used to describe a property of machines or programs: the intelligence that the system demonstrates. AI research uses tools and insights from many fields, including computer science, psychology, philosophy, neuroscience, cognitive science, linguistics, operations research, economics, control theory, probability, optimization and logic. (Artificial Intelligence, n. d.). Adding an intelligent side to all applications at the library is a real opportunity to understand the patterns in user behaviour and adapt to their needs. It can be effectively used to connect people to information and, more importantly, to other people. Sennar (2018) reports the widespread use of AI and robots in hospitality industry including food chain markets. In this context, days are not far off when they will find extensive use in libraries too. AI provides a real opportunity for libraries to understand the patterns in user behaviour and adapt to their needs.

6.4 Blockchain Technology

The Blockchain is a technology based on the virtual digitized decentralized network with "blocks" of information. When you add any information in the network (e. g. transaction), you add it in all computers in the network. But if another user in this network adds his information and make a new block after yours, you can't modify your block. However, you can edit your block if you make it editing from all computers in the network and make similar changes in one moment only. It makes Blockchain one of the best technology for saving and structure information. It represents a decentralized database that keeps records of digital transactions that are visible to anyone within the network. Brown (2018) reports the researches going on in the field of application of this technology in the information profession. According to Sue Alman, an investigator in the field, blockchain technology could be used to build an enhanced metadata system for libraries and data centers, to keep track of digital-first sale rights and ownership, to connect networks of libraries and universities, or even to support

community-based borrowing and skill sharing programs (Brown, 2018).

6.5 Internet of Things

The internet of things (IoT) is a computing concept that describes the idea of everyday physical objects being connected to the internet and being able to identify themselves to other devices. The term is closely identified with RFID as the method of communication, although it also may include other sensor technologies, wireless technologies or QR codes. (Internet of Things, n. d.). It is a fact that most people think about connecting computers, tablets and smartphones. But IoT, on the other hand, makes it possible to envisage a world where anything can be connected and communicate in an intelligent fashion. It is interesting to think that with the internet of things, the physical world is becoming one big information system. Using IoT, libraries can offer a better user experience by enriching their services and collections.

6.6 Robotics

The word robot first appeared in 1921, in Karel Capek's play R.U.R., or Rossum's Universal Robots. It comes from the Czech for "forced labor." A robot is an intelligent, physically embodied machine. A robot can perform tasks autonomously. A robot can sense and manipulate its environment (Simon, 2018). The field of Robotics encompasses everything to do with the design, engineering, programming, testing and development of robots, machines designed to perform tasks currently or previously performed by humans. Robotics projects and applications can be found across a large number of industries from automotive production to military drone operations to landing on and exploring Mars. Robots are increasingly finding a place in restaurants, old age homes, medicine, education, security systems and so on. A number of libraries have already successfully implemented some kind of automated technology. A typical example is Connecticut's Westport Library. Named as Vincent and Nancy,

they are used to help teach coding and computer-programming skills (Waldman, 2014).

6.7 3 D Printing

3 D printing or additive manufacturing is a process of making three dimensional solid objects from a digital file. The creation of a 3 D printed object is achieved using additive processes. In an additive process an object is created by laying down successive layers of material until the object is created. Each of these layers can be seen as a thinly sliced horizontal cross-section of the eventual object. Chuck Hull invented the first 3D printing process called 'stereolithography' in 1983. In a patent, he defined stereolithography as 'a method and apparatus for making solid objects by successively "printing. More and more academic and public libraries are coming forward to install 3D printers especially in connection with the development of makerspaces which are becoming immensely popular among the library users. Children are very much delighted to craft their own toys. They also give an opportunity to adults to understand the impressive power of technology.

6.8 Drones

A drone is an unmanned aircraft. Drones are more formally known as unmanned aerial vehicles (UAVs) or unmanned aircraft systems (UASs). Essentially, a drone is a flying robot. The aircrafts may be remotely controlled or can fly autonomously through software-controlled flight plans in their embedded systems. Drones are equipped with different state of the art technology such as infra-red cameras (military UAV), GPS and laser (military UAV). Drones are controlled by remote control system also sometimes referred to as a ground cockpit (Corrigan, 2018). Libraries have already started book delivery systems using drones. It is also possible to use drones to deliver books to those users who are not able to go to the library due to physical disability or distance.

7. Relevance of Ranganathan

No longer just storehouses of books, libraries are increasingly emerging as a focal point for

the information needs of any society. Libraries today need to evolve as hubs where people from different strata come forth to share their views. The digital generation needs skills of the library professional all the more today to organise their personal collections in different forms. The libraries must organise brainstorming sessions and champion the cause of integrating information into the lives of the common people. Librarians must stop complaining / cribbing about the lack of funds and resources, but rather try to rope in corporate sectors and the public to offer user-centric services. Librarians need to be more vocal about the products and services offered at the library. They must aggressively market their customised services in order to remain in great demand. The librarians must be proactive and create a demand for the library as a space, not just for storing books but an environment aloft with knowledge and ideas. Information is the lifeblood of society and is vital for the development and progress of any community. Access to information is of utmost importance to maintain balance amongst all strata of a society. The Library must evolve as a place of holistic learning and sharing, which will lead towards the development of any society. The libraries have always existed and will continue to do so, no matter the varying media of information storage. This makes us wonder if Dr. S. R. Ranganathan was already aware of the above fact, when he formulated the Fifth Law: *Library is a growing organism.*

There may be many who question the relevance of the five laws of Library Science, put forth by the Father of Library Science in India, S. R. Ranganathan in 1931 in the ever changing and evolving technological age. Although there may be variations to Ranganathan's five laws, his laws remain fundamental that stand the test of time. Every piece of information that is imparted to be recorded is meant for use. The increasing availability of information dispersed in various forms calls for a customised and personalised

service. Products and services should be designed to provide the right information to the right reader at the right time. The need of the hour is as professionals, librarians must constantly continue to evolve. They must keep abreast of the recent developments and try to keep on par with the needs of the user community. S. R. Ranganathan allotted a desk for a reference librarian; he defined customised service. As Maslow points out Man is a social animal, and not all men are equal in their needs and demands. The librarians must make use of the above discussed technologies to meet the ever-increasing and diverse demands of the user community. Instead of blaming the dynamic web technologies, they should adopt them and adapt themselves effectively to offer a gateway into the myriad world of information.

8. Conclusion

Librarians must strive to strike a bond with their user community; they must be the face behind the services offered. They must cease to be just providers of books, journals and other information resources. The librarians must create a demand for their products and services by making use of appropriate tools. Librarians and libraries are in the spotlight today and must continue to evolve as the sources of accurate and authoritative information.

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