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Contents

- | | | |
|-----|--|----|
| 1. | Security of Library Resources
Ms. Meena Kumari | 03 |
| 2. | Instant Messaging Apps are the Usefull Tools for Sharing Information :
A Study of IPS Academy, Indore
Dr. Preeti Patel | 11 |
| 3. | Role of Librarian in Changing Environment
Dr. Tushar M. Patil | 24 |
| 4. | Grey Literature: A Valuable Information Source
Mr. Yogaraj S. Firke, Dr. Govardhan P. Aute | 28 |
| 5. | User Expectations from the Library:
A Case Study of Maharshi Dayanand College Library, Mumbai
Dr. Vinita Jain | 34 |
| 6. | Design Thinking in GNIMS Library, Mumbai
Prof. Kuljeet G. Kahlon, Dr. Dinesh A. Sanadi, Ms. Neeta Malik | 41 |
| 7. | Impact of Social Networking on College Library
Dr. Nita A. Kene | 45 |
| 8. | Artificial Intelligence - A Revolutionary way to strengthen
Indian Education System
Mr. Gowtham Ramkumar | 49 |
| 9. | Use Pattern among Reasearchers in Geography :
A Citation Analysis Study
Mr. Rahul K. Tupe, Dr. Shashank S. Sonawane | 56 |
| 10. | Application of Cloud Computing and Academic Library Services
Md. Zubair Ahmad, Dr. Gorantla Siva Prasad | 69 |

Contents

11.	Dissecting Design Thinking for Education Dr. Bigyan P. Verma	76
12.	Research Output and Citation Analysis of Leading Global Engineering Research Countries during 2012 - 16 Mr. Mahipal Datt, Dr. Khushpreet Brar	83
13.	Services and Practices of Central Library of Government Medical College Jammu An Analysis Dr. Reenu Arti Thakur	91
14.	Social Media : A Useful Marketing Tool for Libraries Prof. Manisha H. Umap	99
15.	Pre Challenge Analysis Tool as Competitive Advantage to Deploy Change In Libraries and Information Center Dr. Seema Lalotra	102
16.	Digital Resources and Agriculture Universities Dr. Arvind Mittal	109
17.	Career Blog As a Distance Guidance Tool by Libraries : A Case Study of Asmita College Library Dr. Nidhi N. Rakshikar	116
18.	Effective Use of E-Resource with the Design Thinking Approach Ms. Reshma K. Ajetao	122
19.	Fair Dealing Under Indian Copyright Law Ms. Purnima Joshi, Dr. Medha Joshi	131

ABSTRACT :

Libraries are defined as organized collection of published and unpublished books and audiovisual materials with the aid of services of staff that are able to provide and interpret such material as required, to meet the informative research, educational and recreational needs of its users. Libraries are regarded as agencies through which sources of information of accumulated knowledge and experiences are selected, acquired, organized, preserved and disseminated to those who need them. Libraries are essential tools in learning at any level. It is the intellectual centre of the society containing records not only the intellectual but also of cultural, economic and social inclination. With the provision of wide variety of information sources, users of libraries are exposed to different information with their respective values. They also give users the opportunity to learn and continue learning throughout their lives. This article includes that how library resources can secure. What are different types of library resources and how they can secure.

Keywords : Library Resources, Security, Preservation, Conservation of Resources

Library Resources :

A library is an organized collection of sources of information and similar resources, made accessible to a defined community for reference or borrowing. It provides physical or digital access to material, and may be a physical building or room, or a virtual space, or both. A library's collection include books, periodicals, newspapers, manuscripts, films, maps, prints, documents, microform, CDs, cassettes, videotapes, DVDs, Blu-ray Discs, e-books, audio books, databases, and other formats. Libraries range in size from a few shelves of books to several million items.

Types of Library Resources :

Today's libraries are repositories and access points for print, audio, and visual materials in numerous formats, including maps, prints, documents, microform (microform/microfiche), CDs, cassettes, videotapes, DVDs, videogames, e-books, audio books (microfilm/microfiche), and many other electronic resources. Libraries often provide facilities to access to their electronic resources and the Internet. Modern libraries are increasingly being redefined as places to get unrestricted access to information in many formats and from many sources. They are extending services beyond the physical walls of a building, by providing material accessible by electronic means, and by providing the assistance of librarians in navigating and analyzing tremendous amounts of information with a variety of digital tools.

Because they serve such a diverse range of people, libraries maintain collections that can span the spectrum of human knowledge and opinions. Collections include printed materials such as reference sets, paperback novels, biographies, children's and young adult literature, histories, newspapers, and magazines. They usually also contain photographs, maps, art reproductions, sound recordings, and video recordings. In addition to print and audiovisual materials, computer workstations with software, CD-ROMs, and connections to information worldwide through the Internet.

These library resources play significant roles in education

I. Human resources (Librarians/information professionals)

II. Physical resources (building, conducive environment for learning and teaching, computer, etc)

III. Library resources (print and electronic instruments)

A library is an organized collection of sources of information and similar resources, made accessible to a defined community for reference or borrowing. It provides physical or digital access to material, and may be a physical building or room, or a virtual space, or both.

Primary sources :

Definition:

Primary sources are original materials. They are from the time period involved and have not been filtered through interpretation or evaluation. Primary sources are original materials on which other research is based. They are usually the first formal appearance of results in physical, print or electronic format. They present original thinking, report a discovery, or share new information.

- Artifacts (e.g. coins, plant specimens, fossils, furniture, tools, clothing, all from the time under study);
- Audio recordings (e.g. radio programs)
- Diaries;
- Internet communications on email, listservs;
- Interviews (e.g., oral histories, telephone, e-mail);
- Journal articles published in peer-reviewed publications;
- Letters;
- Newspaper articles written at the time;
- Original Documents (i.e. birth certificate, will, marriage license, trial transcript);
- Patents;
- Photographs
- Proceedings of Meetings, conferences and symposia;
- Records of organizations, government agencies (e.g. annual report, treaty, constitution, government document);
- Speeches;
- Survey Research (e.g., market surveys, public opinion polls);
- Video recordings (e.g. television programs);
- Works of art, architecture, literature, and music (e.g., paintings, sculptures, musical scores, buildings, novels, poems).
- Web site.

Secondary sources :

Definition:

Secondary sources are less easily defined than primary sources. Generally, they are accounts written after the fact with the

benefit of hindsight. They are interpretations and evaluations of primary sources. Secondary sources are not evidence, but rather commentary on and discussion of evidence. However, what some define as a secondary source, others define as a tertiary source. Context is everything.

- Bibliographies (also considered tertiary);
- Biographical works;
- Commentaries, criticisms;
- Dictionaries, Encyclopedias (also considered tertiary);
- Histories;
- Journal articles (depending on the discipline can be primary);
- Magazine and newspaper articles (this distinction varies by discipline);
- Monographs, other than fiction and autobiography;
- Textbooks (also considered tertiary);
- Web site (also considered primary).

Tertiary sources :

Definition :

Tertiary sources consist of information which is a distillation and collection of primary and secondary sources.

- Almanacs;
- Bibliographies (also considered secondary);
- Chronologies;
- Dictionaries and Encyclopedias (also considered secondary);
- Directories;
- Fact books;
- Guidebooks;
- Indexes, abstracts, bibliographies used to locate primary and secondary sources;
- Manuals;
- Textbooks (also be secondary).

Security of Library Resource :

It is the responsibility of the library manager to initiate, coordinate, and implement the development of a security policy within the library. When drafting such a policy other libraries, police, and staff should be consulted.

All library material should be stamped in a way that clearly identifies it as belonging to a particular institution. Library stamps should be fast-drying, non-fading, stable, and indelible. Security tagging systems, if present, should be regularly inspected.

Securing perimeters and buildings

- Library perimeters and grounds should be kept tidy.
- Building exteriors should be assessed for ease of access by criminals. An alarm and closed-circuit television system should be seriously considered. All areas should be well-lit.
- Close attention should be paid to doors and windows in respect of locks, security glass, or film.
- The interior of the building should be kept tidy. It will present an image of care and supervision which will deter the potential criminal.
- All entry/exit points and routes should be kept separate if possible and staffed at all times.
- Any staff areas should be locked when not in use.
- Expensive equipment should be chained or bolted down and marked with security markings.
- All contractors should sign in and out of the library and wear passes at all times.
- The need for an alert attitude should be instilled in staff.
- All storage areas should be kept secure and clear policy guidelines provided on who has access to what areas. Specific measures, like the use of vaults, should be taken for the security of rare/valuable material.

Preventing criminal and anti-social behavior :

Criminal and anti-social behaviour ranges from the rowdy visitor to the determined thief. Staff, books, equipment, and personal property are all at risk. Starting-points in deterring criminal and anti-social behaviour include:

having a calm and ordered library creating an environment which the genuine reader regards as helpful and efficient, but in which the villain feels anxious and wary having prominent notices which clearly define what is unacceptable behavior training staff in how to deal with an awkward or aggressive user or a suspected book thief.

Security in reading areas :

Points to consider:

How are loose items issued and how are they checked on return?

How well are reading areas invigilated?

Are security devices in place?

Are bags allowed in these areas and are they checked on exit?

As part of the building survey, all areas of security should be noted and shortcomings addressed as soon as possible.

Emergency Information Booklet :

It is useful for all staff to have easy access to an emergency information booklet which lists only the immediate steps to be taken, key personnel, and how they can be contacted in the event of: accidents to staff and visitors vandalism, theft, and assault incidents like power failures, lift failures, loss of security keys emergencies which threaten the welfare of people, the collections, and the fabric of the buildings – e.g. bomb threats hurricane, earthquake, and flood warnings.

Prevention :

Once the risks have been assessed, take all the necessary precautions to make the library buildings and their holdings secure. Consult with the emergency services (fire, police, and hospital).

- Fire alarm systems

All parts of the building should be provided with a fire and smoke detection system, which simultaneously alerts occupants and the local fire brigade. Smoke detection equipment can provide early warning of a developing fire, thereby giving an opportunity of manual suppression prior to the activation of a sprinkler system.

Manually operated fire-alarm call points, which can be used by occupants to indicate the presence of fire or smoke, should also be present throughout the building.

- Manual extinguishing systems

If an automatic fire extinguishing system is not present, the following should be installed:

Hose reels or racks so as to ensure that all parts of the building are within 6 m of the nozzle of a fully extended hose.

- Hydrant systems or rising mains on all buildings more than 30 m in height or where a single floor exceeds 1000 m².

The hydrant or rising mains should be located so as to permit the fire brigade to pressurize the pipe work from outside the building.

Portable fire extinguishers should always be available, even if an automatic fire suppression system has been installed. There should be a suitable number of hand-held extinguishers (CO₂, water, or foam according to the likely cause of fire, i.e., electrical or chemical) strategically placed.

- Automatic extinguishing systems

Consideration should be given to the benefits offered by an automatic fire extinguishing system.

A CO₂ gas system is only suitable for smaller compartments, i.e., spaces which can be made airtight and which are not normally occupied by people.

Halon gas systems are no longer produced as they are environmentally damaging, particularly toward the earth's protective ozone layer.

- Wet-pipe sprinkler systems are a reliable and safe extinguishing method and are relatively easy to maintain. Contrary to popular belief, the activation of one sprinkler does not cause all sprinklers to operate; and so danger of accidental discharge should not be over-estimated. The average sprinkler discharges 15–20 gallons per minute (90 liters per minute) while typical fire hoses release 120–250 gallons per minute (540–1125 liters per minute). It is important to remember that the environmental and human safety aspects of water are known, unlike the possible impact from various chemical agents. Furthermore, the recovery techniques for water-damaged material are also known.

- Dry-pipe sprinkler systems are essentially the same as wet-pipe systems except that the pipes in the protected area contain pressurized air. When the sprinkler is activated a valve opens allowing water to flow into the pipes. This lessens any threat of water leaking into collection areas.

Micro mist systems are being developed which discharge limited quantities of water at very high pressures, resulting in exceptionally efficient cooling and rapid fire control with significantly little water. Tests have proved that water saturation, often associated with standard firefighting procedures, is avoided.

Other anticipated benefits include:

- Lower installation costs, minimal aesthetic impact, and known environmental safety.
- Routine maintenance
- Fire alarms and suppression systems, the building fabric, plumbing, electric, and gas supplies and fittings, etc.,

should be maintained and routinely tested. All reports should be kept and any maintenance work documented.

- What are the main threats to library material?
- The nature of the material itself
- Natural and man-made disasters
- The environment in which it is kept
- The way material is handled
- Traditional library collections contain a wide range of organic materials, including paper, cloth, animal skins, and adhesives. Such organic substances undergo a continual and inevitable natural ageing process. While measures can be taken to slow this deterioration by careful handling and providing a sympathetic environment, it is impossible to halt it altogether.
- The chemical and physical stability of library material also depends on the quality and processing of the raw products used in their manufacture together with the design and construction of the final artifact.
- Over the centuries, the pressures of mass production have reduced the material quality of what is received in libraries. Much of the paper stock manufactured after 1850 is highly acidic, is becoming brittle, and will self-destruct in time. Binding techniques have been abbreviated for the sake of automation and many textbooks are now held together solely by adhesive. In fact, all books and, in particular, leather bindings, are far more susceptible to damage than most people appreciate.
- Modern media such as microforms, optical and magnetic disks, digital formats, photographs, and audio and visual media, all have inherent preservation problems and need to be stored and used carefully if they are not to perish prematurely.
- It is commonly difficult to accept is that a large amount of library material is reaching the end of its natural life, and the few years that it has left can only be prolonged by careful handling and storage.

Why preserve?

- The type of library and how it is used reflect the preservation needs of its collections. The preservation requirements of a local public lending library are obviously different from those of a national library. However, both are obliged to maintain and keep accessible their collections, whether for a few years or indefinitely.
- Economically, libraries cannot afford to let their holdings wear out prematurely.
- Replacing library material, even when possible, is expensive. Preservation makes good economic sense.
- It cannot be easily predicted what will be of interest to researchers in the future. Preserving current collections is the best way to serve future users.

Responsible and professional library staff should be committed to caring for and preserving the material with which they work.

Who is responsible?

- Everyone is responsible. While preservation and conservation specialists can advise and carry out specific activities, it is the duty of all library staff, from the head of the library downwards, to safeguard the welfare of their holdings. Preservation measures have to be endorsed, supported, and encouraged from the most senior level to the most junior in the library.

- Those who are responsible for managing the library and maintaining the external and internal fabric of the buildings must liaise closely with those who are responsible for the welfare of the collections. For example, if money has been set aside to rewire and replace the lighting of a building, then the opportunity should be used for ensuring not only that energy-saving lighting is used but also that it meets particular preservation lighting requirements. When plumbing is being installed or replaced, all concerned should be working towards ensuring that risks to the collections are reduced, and not increased by having pipes running through areas where library material is present. In such instances clear communication is the key.
- The preservation needs of a library have to be considered in line with the social and political climate in which the organisation operates. The organisation's purpose, collecting policies, and available resources also have to be taken into account.
- Consequently, preservation policies must be made in consultation with various departments for the following reasons:
- The acquisitions and collecting sections of a library should be prepared to purchase additional copies of heavily used material, like reference works, when the cost of repairing such items is greater than replacing them. It is also necessary to calculate whether surrogate copies (i.e., microform or electronic versions, and the machines to read them) are a more economical and effective way of providing access to heavily used material than 'hard' copy.
- A policy should be agreed with the cataloguing and record-creating activities of the library together with readers' services to direct users to surrogates rather than originals and to the most appropriate copy.
- Departments should plan for sufficient, good-quality accommodation for acquisitions.
- Reading room staff should be kept informed of any restrictions concerning the use of original material and briefed on limitations to photocopying.
- Resources should be provided for training staff on security for themselves and for library material, on how to handle library material correctly, and on how best to pass this knowledge on to users.
- An exhibition policy should be drawn up which ensures that items will not come to harm while on exhibition, whether within the library or on loan to other institutions. Librarians and conservation staff should agree on whether items are fit for display. Adequate support and security, and suitable environmental conditions for material to be exhibited, should be enforced.
- Preservation staff and those responsible for the collections, whatever their level of experience, should not only have some technical and scientific knowledge, but should also be familiar with the history of collections, the material they are made of, and the contents of the documents – so as to be able to understand better the preservation problems. Librarians, library staff at all levels, and students of librarianship should be acquainted with the importance of preservation within a library's overall function and policy.

Conclusion :

Libraries are vital institutions, which cannot be separated from education. The provision of libraries is crucial and indispensable to education in a nation. Therefore, whatever is done to improve the quality of education is done to improve the nation. The absence of libraries will have negative effects on education. Therefore, individual learners should be encouraged to use them. And the security of library resources is necessary so that they can be maintained properly for future use.

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Instant Messaging Apps are the Usefull Tools for Sharing Information :

A Study of IPS Academy, Indore

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ABSTRACT :

Web 2.0 tools become essential part of current day life. Instant messaging apps are the effective mean of communication via mobile phones. This study covers the effect and use of instant messaging apps by the students. Closed questionnaire distributed to Pg and UG Students. Studies found good response from the students and analyse the usefulness of the Instant messsing apps in sharing information. Most of the PG student use instant messaging apps for sharing study material, and preparing their studies.

Keywords : Instant Messaging Apps, WhatsApp, Hike, Viber, Web 2.0

Introduction :

Instant messaging has proven to be similar to personal computers, email, Mobile and the World Wide Web, in that its adoption for use as a business communications medium was driven primarily by individual employees using consumer software at work, rather than by formal mandate or provisioning by corporate information technology departments. Tens of millions of the consumer Instant Messaging accounts in use are being used for business purposes by employees of companies and other organizations. Current age of Information Communication Technology provides a wide range of communication techniques not only on computers but mobile phones also. A Mobile phone which has all internet features become more popular other than simple mobile phones which are used on only in this study researcher cover the apps used in android mobiles for instant messaging.

Review of Literature :

Y. Sudharani and K. Nagaraju (2016)¹ the study clearly proved that all he respondents are using WhatsApp and it is a popular mobile messaging app among the engineering students of SVU College of engineering, Tirupathi. Diwan. M (2015)² study demonstrates the use of WhatsApp among the students of IIPS, Devi Ahilya Vishawavidyalaya, Indore. The study explains that respondents do not share Audio much frequently and do not change their status frequently. Azhar Amanullah & Mohammad Ali (2014)³ study investigated the most favourable mobile messaging apps among International Islamic University of Malaysia. The study found that WhatsApp is the most favourable mobile messaging app among IIUM students since all of the students in the survey installed WhatsApp in their phones. Yeboah & Ewur (2014)⁴ study find out the positive and negative impacts of Whats App use on students' performance in tertiary institutions in Ghana. They report that distraction from studies, damaging language spelling and grammar and lack of focus on lecturers are the negative impact by using Whats App. Tawiah.Y, Nondzor & Alhaji (2013)⁵ study investigated the student's preference of WhatsApp and voice calls in Ghana. The results indicated that 92% of the students prefer WhatsApp application to voice call. Musthafa. K (2012)⁶ says in his study the social networking experience of university student in India. The objective of the study was found out the use of Face book by the student of Aligarh Muslim

University, India and to explore how and why they use face book. Time spent on face book and satisfaction level of student has been investigated. An Attempt has been done to determine the problem faced to use SNSs. Hasan, Nabi (2012)⁷ discuss in his paper the background, concepts and current information on social networking and micro-blogging websites, twitter. It explores the application of twitter in library and information centers for various purposes. Limitation / demerits of the twitter with reference to its use in LICs have been highlighted. Some of the important libraries using the twitter for its services have been enumerated. Aqil, Mohammad & Ahmad, Parvez (2011)⁸ had assess and highlight the potential of Web 2.0 in the context of libraries. The concept of Web 2.0 such as social networks, RSS feeds, blogs, streaming media, podcasts, Wikis, tags, mashups, etc. is defined and the possible applications in various library functions and activities are mentioned. Soni, Gautam & Verma, Neeraj (2010)⁹ had converse the web 2.0, its characteristics, tools (blogs, wikis, RSS feeds, social networks, podcasting, tagging and Instant Massaging etc.) and possibilities to incorporate these tools and technologies in library and information services. It focuses on transformation of library services from Web 2.0 to Library 2.0 and the role of Librarian 2.0 in digital environment. It also seeks the fundamental constraints in implementation of Library 2.0 especially in Indian scenario.

Objectives of the Study :

Keeping the gap in assessing the use of instant messaging among the students in view, the study aims:

1. To find out the use of instant messaging by the PG students of the IPS Academy, Indore.
2. To understand that out instant messaging, how much used by the student for study purpose.
3. To find out how much they use instant messaging for knowledge sharing.
4. To explore their views about the purpose of its use.
5. To know how much time they spend on it.
6. To determine their problems to use instant messaging apps

About IPS Academy :

The IPSA Knowledge hub is accomplishing its task of reaching to the wider academic community. Academy has 56 Acre lushes' campus with more than 70 courses. It has six libraries within campus. All Libraries are in the midst of the academic complex of the IPSA and is the hub of all the academic activities of the IPSA and provides comprehensive access to books, journals, reports, e-journal/online databases, e-books, electronic theses and dissertations. Approx 10000 student are studying there in different courses.

Limitation of the Study :

There is variety of Instant Messaging Apps available. In this study, the researcher cover the most popular mobile instant messaging apps that people are turning to as a replacement or additional service to SMS texting.

About Web 2.0 :

The concept of "Web 2.0" began with a conference brainstorming session between O'Reilly and Media Live International. Dale Dougherty, web pioneer who has noted that the Web was more important than ever with exciting new application and site popping up with surprising regularity. Wikipedia defines Web 2.0 as "an idea in people's heads rather than a reality. It's actually an idea that the reciprocity between the user and the provider is what's emphasized. In other words, genuine interactivity, if you like, simply because people can upload as well as download." It includes a social element where we generate and distribute content often with freedom to share and reuse. This can allegedly result in a rise in the economic value of the web as a user can do more online. It is also called as social networking.

Characteristics of Web 2.0 :

Web 2.0 is the method by which data and services previously locked into individual web page for reading by the human beings can be liberated and then reused. It has lead to the information explosion to the globe. The following are important characteristic of Web 2.0

- Web 2.0 permits the building of **virtual** applications, drawing data and functionality from several different source as appropriate.
- Web 2.0 is **participative**. The traditional web has tended to be somewhat one sided with a flow of content from the provider to the viewer, it allows the user to actively participate online by means of blogging, sharing files or equivalent.
- User can **own** the data on a Web 2.0 site and exercise control over that data.
- Web 2.0 is **smart** application which will be able to capture user's knowledge and deliver services to satisfy their needs.
- Web 2.0 is built upon **trust**, whether that is the trust placed on individuals, in assertions or in the users and reuse of data.
- Web 2.0 is about **sharing**: code, content, ideas.

About Instant Messaging :

There are a number of Web-based services and applications that demonstrate the foundations of the Web 2.0 concept, and they are already being used to a certain extent in education. These are not really technologies as such, but services (or user processes) built using the building blocks of the technologies and open standards that underpin the Internet and the Web. These include instant messaging, blogs, wikis, and multimedia sharing services, content syndication, podcasting and content tagging services.

About Instant Messaging :

Instant messaging is a real-time text/audio/video communication between more than one individual. Many new and upcoming library systems incorporate this useful utility. The early part of this century saw the advent of web based catalogues which have made use of this utility to communicate with its users in a much more innovative and useful way. In the earlier versions of OPAC there used to be a section know as frequently asked questions which covered a number of issues in the libraries, but those services were merely stock questions and answers which were not dynamic. Currently, most of the integrated library systems come with a suite called Reference Librarian, or Reference Desk which is more interactive. The users get interactive help on many issues through this reference desk. Interestingly, these reference desks are becoming more and more interactive with more multi-media experience where audio and video messaging has become common. One of the main advantages of this service is that the transcripts of these references are valuable tools for the evaluation and analysis for future reference. Many integrated library systems use this service in their OPAC interface. IM has become increasingly popular due to its quick response time, its ease of use, and possibly of multitasking. It is estimated that there are several millions of IM users, using for various purposes, viz: simple requests and responses, scheduling face to face meetings, or just to check the availability of colleagues and friends.

Types of Instant Messaging :

IM products can usually be categorized into two types:

Enterprise Instant Messaging (EIM) :

Enterprise solutions use an internal IM server; however, this isn't always feasible, particularly for smaller businesses with limited budgets.

Consumer Instant Messaging (CIM) :

The second option, using a CIM provides the advantage of being inexpensive to implement and has little need for investing in new hardware or server software.

Use of Instant Messaging

- **Purely Personal Reasons**

Easily the most common use of Instant messaging, and the main reason for them existing in the first place, is for personal reasons. The majority of people using Facebook or Myspace keep to the “social” label. It is used for its original purpose – to keep in touch with friends. Some people will go on simply to update their status or view their friends’ statuses, or to look at photos from the weekend’s night out. Some use it to connect to people they’ve met, a potential girlfriend/boyfriend perhaps, or someone who shares the same interests.

The people, who use the tools for these purposes, sometimes have no idea that marketing is going on, or that it is possible to use these networks for business purposes, and some even simply ignore advertising all together.

- **Business – Connecting with customers**

With the rise of Internet Marketing, social media is being embraced by businesses more and more. Companies are seeing that the best way to conduct them online is to speak to their customers directly using these instant messaging. Instant messaging being especially useful for this. It increases the reputation of the company, gets them positive reviews and shows that they really care about the customer.

- **Business – Networking**

There is also the opportunity for business types to network and expand their business on the social networking platform. This can take many forms, and take bits of each of points 1 and 2.

To get a deal is all about knowing the right people, and if somebody that you went to school with owns a multimillion dollar business and their company do what he is looking for, using Instant Messaging could have you on to a winner. A random message from somebody you haven’t spoken to since you were 11 years old could be the key to your company’s success.

- **Marketing**

Another Instant messaging success story that this using in internet marketing strategy.

Companies also post special offers just for their users, and they send information about sales, along with discount vouchers to their Instant message followers. The company has generated million in revenue from this venture.

This shows the power of marketing on instant messaging. This sort of strategy works well for e-commerce sites, especially as they can market to an already targeted audience.

- **Entertainment**

Going hand in hand with the ‘social’ element of instant messaging, people sometimes go on purely for entertainment purposes. WhatsApp is a prime example of this, as many famous artists have been discovered through these sites (sort of sounds like marketing, huh?). Music is a big part, but also videos, such as YouTube viral offerings, are easily spread on instant messaging.

It is very important to know the different usage of instant messaging.

Application of Instant Messaging in Library Science

- Instant clarifications for the Questions from users and vice versa.
- Reference librarians can also send text, video and audio files such as library instruction files, ready references etc.
- Online meetings.
- For providing virtual reference services.

Instant Messaging Apps :

There is variety of Instant Messaging Apps available. In this study researcher found the information search only by the apps used in android mobile phone. Major IM services are controlled by their corresponding companies. They usually follow the client-server model when all clients must first connect to the central server. WhatsApp, Line, Viber, telegram, Hike are some examples of the Apps which developed by the different companies.

Types of Instant Messaging apps :

There are varieties of instant messaging Apps are available. Detail of Apps given as following.

WhatsApp :

WhatsApp Messenger is a freeware, cross-platform and end-to-end encrypted instant messaging application for smartphones. It uses the Internet to make voice calls, one to one video calls; send text messages, images, GIF, videos, documents, user location, audio files, phone contacts and voice notes to other users using standard cellular mobile numbers. It also incorporates a feature called Status, which allows users to upload photos and videos to a 24-hours-lifetime feed that, by default, are visible to all contacts; like Snapchat, Facebook and Instagram Stories.

Viber :

An instant messaging and VoIP app for various mobile operating systems. Users can also exchange images, video and audio media messages. With Viber user can send messages of all types and make phone calls to other Viber users for free. Communicating with friends and family near and far has never been more fun. User can make audio and video calls, send video or voice messages, use stickers, GIFs and more. Use Viber on your smart phone, tablet and computer when you're connected to a Wi-Fi, 3G or 4G network.

IMO :

Many people use the abbreviation in instant messenger sessions, chats, and text conversations. Unlike other acronyms adopted by people, IMO has one popular meaning. Instant messaging platform imo sends word that it's launched video calls across its Android and iOS mobile apps. The feature works over Wifi, 3G and 4G connections, adds to imo's array of messaging features, which includes support for nine third-party IM services. IMO is a very clean and easy to use instant messaging client which allows users to talk with their friends on MSN, Skype, Yahoo, GTalk, Facebook, AIM/ICQ, Jabber VKontakte, Myspace, Hyves and steam accounts all from the same interface.

LINE :

Line (styled as *LINE*) is a freeware app for instant communications on electronic devices such as smartphones, tablet computers and personal computers. Line users exchange texts, images, video and audio, and conduct free VoIP conversations and video conferences. The application also exists in versions for laptop and desktop computers using the Microsoft Windows and macOS platforms. This application also has a feature to add friends through the use of QR codes, by line id, and by shaking phones simultaneously. The application has a direct pop-out message box for reading and replying to make it easy for users to communicate. It also can share photos, videos and music with other users, send current or any specific location, voice audio, emojis, stickers and emoticons to friends.

HIKE :

Hike Messenger (stylized as hike) is a cross-platform instant messaging service for smartphones that uses the internet for communication. In addition to text messaging, users can send each other graphical stickers, emoticons, images, videos, audios, files, voice messages, contacts and user location. Hike supports 2-way chat themes that a user can change according to their relationship with person or their mood. The options for chat themes are limited but one set the theme with their own pictures. Apart from basic social messaging means like photos, videos, emoticons and audio files, hike has 5000+ graphical stickers. The stickers are available in multiple Indian languages. The messenger provides free voice-calling and video-calling over 2G, 3G and Wi-Fi across the globe in over 200 countries.

Message Me :

Apple iMessage (Apple instant message) is an instant messenger service developed by Apple Inc. that allows end users to send texts, documents, photos, videos, locations, contact information and group messages over Wi-Fi, 3G or LTE networks to other iOS or OS X users.

MessageMe is a communication tool along the lines of another similar instant *message*. Another *feature* that makes *MessageMe* different from other messaging clients is its “walkie-talkie”. A messaging *app* with an integrated web browser.

Facebook Messenger :

In December 2012, Facebook launched “Facebook Messenger” that is for Android users could sign up to the app without a Facebook account, requiring only a name and phone number. Facebook made it possible for users to send messages to other users without the requirement of being friends, as long as the user has the phone number of the other user in their contact list.

User can use “Chat Heads” feature to its Messenger Android app, which displays a round icon with a contact’s profile photo, appearing on the screen regardless of which app is open.

In April 2015, Facebook introduced video calling in Face book Messenger. Location sharing

button and are then shown a map with the ability to pinpoint any location, even if the user themselves is not present at the place. In March 2017, it introduced live location sharing; letting users temporarily share their location with a friend or group of friends for one hour at a time.

SNAPCHAT :

Snapchat is an image messaging and multimedia mobile application created by Evan Spiegel, Bobby Murphy, and Reggie Brown,[6] former students at Stanford University, and developed by Snap Inc., originally Snapchat Inc. One of the principal concepts of Snapchat is that pictures and messages are only available for a short time before they become inaccessible. The prototype for Snapchat was started by Brown and Spiegel as a project for one of Spiegel’s classes at Stanford, where Spiegel was a product design major.

Snapchat evolved into a mix of private messaging and public content, including brand networks, publications, and live events such as sports and music. Nevertheless, according to survey studies conducted in March 2016, the personal oriented messaging was still being accessed by users more than the publicly offered content that was being presented. 71% of users surveyed said that they preferred the app for its chat, messaging, and imaging services, versus 5% who almost exclusively chose the various events, published features, and media content daily.

Telegram :

Telegram is a free cloud-based instant messaging service. Telegram clients exist for both mobile (Android, iOS, Windows Phone, Ubuntu Touch) and desktop systems (Windows, macOS, Linux). Users can send messages and exchange photos,

videos, stickers, audio, and files of any type. Telegram also provides optional end-to-end-encrypted messaging. Telegram is supported by Russian entrepreneur Pavel Durov. Its client-side code is open-source software but contains binary blobs and the source code has not been published for recent versions whereas its server-side code is closed-source and proprietary. The service also provides APIs to independent developers. In February 2016, Telegram stated that it had 100 million monthly active users, sending 15 billion messages per day

Kik :

Kik Messenger, commonly called simply **Kik**, is a proprietary instant messenger software application (app) for mobile devices from the Canadian company Kik Interactive, available free of charge on iOS, Android, and Windows Phone operating systems. It uses a smartphone's data plan or Wi-Fi to transmit and receive messages, photos, videos, sketches, mobile webpages, and other content after users register a username. Kik is known for its features preserving users' anonymity, such as allowing users to register without providing a telephone number. The application logs user IP addresses which the company can use to determine location. As of May 2016, Kik Messenger had approximately 300 million registered users, and was used by approximately 40% of United States teenagers.

3.1 Data Collection and Analysis :

Data is collected from the Post Graduates Students of the IPS Academy, Indore. Total 268 questionnaires were distributed in all departments' PG students. Total 171 filled questionnaires were received from the students. The study based on all 171 received questionnaires i.e. 63.81% responses.

Table-I: General Statistics about responses :

The gender shown vital role in research work. So, first question of questionnaire is related to no of response toward gender. The data shown from the table that 52.63% Male and 47.37% female students' response the questionnaire. The second question is related with familiarity with android phone. The main reason of asking this question is know the familiarity with using android phone because study covers only Instant Messaging Apps use in android phone. The question regarding use of Instant Messaging Apps is necessary to know its function's awareness in the students of IPS Academy. The last question is related with use of these Apps in information sharing and learning process.

It is found from the responses that there is no effect of the gender as seen in the above table. Male and female both almost

Table - I

GENERAL STATISTICS ABOUT RESPONSES								
Particular	Gender	%	Familiarity with Android Phone	%	Use any instant messaging apps	%	Instant messaging apps are useful to information Sharing and learning	%
Male	90	52.63	-		-		-	
Female	81	47.37	-		-		-	
Yes	-		150	87.72	135	78.95	138	80.70
No	-		21	12.28	36	21.05	33	19.30

have shown same responses. 87.72% students are very well familiar with android phone technology; only 12.28% students are not used to with android technology. 78.95% students are using Instant Messaging Apps and more that 80% students

are using instant messaging App for information sharing and learning.

Table-II: Awareness towards Instant Messaging Apps

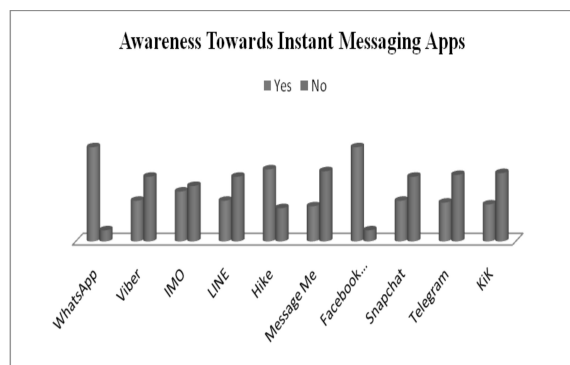
Instant messaging Apps are in the trends in communication. This question helps us to find out the knowledge in students about instant messaging apps. There are variety of instant messaging apps are available. By this question study enable to find the awareness about Instant Messaging Apps among students.

Table -II

Awareness Towards Instant Messaging Apps

Apps name	Yes	No
WhatsApp	89.47%	10.53%
Viber	38.60%	61.40%
IMO	47.37%	52.63%
LINE	38.60%	61.40%
Hike	68.42%	31.58%
Message Me	33.33%	66.67%
Facebook Messenger	89.47%	10.53%
Snapchat	38.60%	61.40%
Telegram	36.84%	63.16%
KiK	35.09%	64.91%

Figure -I



It is clear from the figure that Whats app and Facebook messenger is the favourite instant messaging app in the above list with 89.47% , Hike is the second highest choice with 68.42% and Viber, IMO and Snapchat are on the third choice among students with 36.60%.

Table-III: Preference towards Use of Instant Messaging Apps

There is variety of Instant Messaging Apps available for communication. By this question we enable to observe the user's preference toward using Instant Messaging Apps.

Figure -II

Data shown in the figure that telegram is the highest (80.70%) preferred Instant Messaging App among students, Whats App on the second (70.18%) choice. Hike and Facebook Messenger are almost same responses from the students 57.89% and 56.17% simultaneously. IMO and

Preference towards Use of Instant Messaging Apps					
S.N.	Apps name	Yes	%	No	%
1	WhatsApp	120	70.18	51	29.82
2	Viber	60	35.09	111	64.91
3	IMO	45	26.32	126	73.68
4	LINE	51	29.82	120	70.18
5	Hike	99	57.89	66	38.60
6	Message Me	75	43.86	96	56.14
7	Facebook Messenger	96	56.14	75	43.86
8	Snapchat....	90	52.63	81	47.37
9	Telegram.	138	80.70	33	19.30
10	KiK	66	38.60	105	61.40

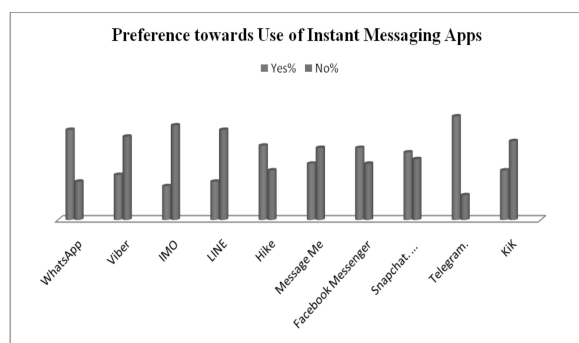


Figure -III

Preference towards time spent in using Instant Messaging Apps for Communication					
S.N.	Time per day	Yes	%	No	%
1	Less than 1 hrs.	45	26.32%	126	73.68%
2	2-3 hrs.	96	56.14%	75	43.86%
3	4-6 hrs.	120	70.18%	51	29.82%
4	More than 6 hrs.	60	35.09%	111	64.91%

following features of Instant Messaging Apps

Instant messaging Apps have variety of features in their tool kit. By this question we are able to find the students responses towards number of features in these Apps. Sending Video, Voice Message, Chatting, Text Message, Images and Photos etc., undelete message, Creating and deleting Groups and Enter in any group without permission of the Admin are eight features are covered in this study.

Table - V

Preference towards the following features of Instant Messaging Apps

S.N.	Features detail	Yes	%	No	%
1	Sending Video	135	78.95	36	21.05
2	Voice Message	138	80.70	33	19.30
3	Chatting	141	82.46	30	17.54
4	Text Message	132	77.19	39	22.81
5	Images and Photos etc.	129	75.44	42	24.56
6	Undelete message	120	70.18	51	29.82
7	Creating and deleting Groups	123	71.93	48	28.07
8	Enter in any group without permission of the Admin	117	68.42	54	31.58

Note: More than one answer is allowed

LINE have almost same lowest responses by the students (26.32% and 29.82%)

Table-IV: Preference towards time spent in using Instant Messaging Apps for Communication

Time plays a vital role in observing the attachment. By this question we enable to find out the per week time spent by the PG students in using Instant Messaging Apps.

Table-IV

70.18% students are spending time on Instant Messaging Apps up to 4-6 hrs per week. 56.14% student spends 2-3 hrs per week in using Instant Messaging Apps. It is clear from the figure that most of the PG students of IPS Academy are spending almost two to six hrs. per week for communication by Instant Messaging Apps.

Table - V : Preference towards the

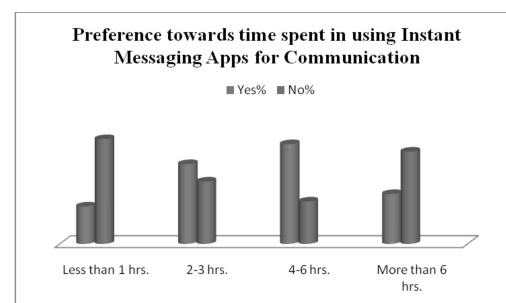


Figure - IV

Data shown from the figure that the students are very well familiar with all the features covered in this study. Chatting and Voice message have almost same response with 82.46% and 80.70%. Sending video and text message have 78.95 and 77.19% response simultaneously. All the features of Instant Messaging Apps have approximately 65% responses. It shows that students of IPS Academy are expert in using all the features of Instant Messaging Apps.

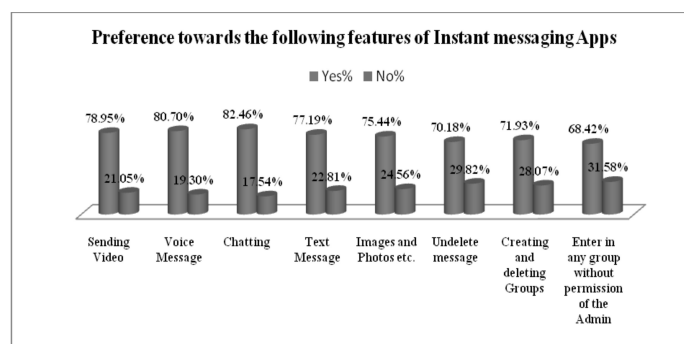


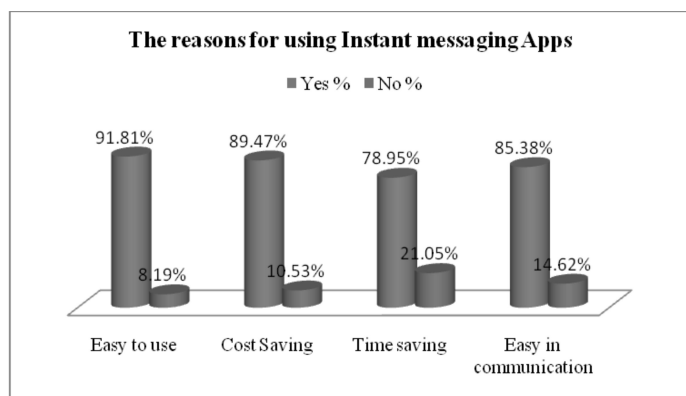
Table-VI: The reasons for using Instant Messaging Apps

The Instant Messaging Apps have variety of reason to use it. By this question we enable to observe the preferable reason

The reasons for using Instant Messaging Apps					
S.N.	Features detail	Yes	%	No	%
1	Easy to use	157	91.81	14	8.19
2	Cost Saving	153	89.47	18	10.53
3	Time saving	135	78.95	36	21.05
4	Easy in communication	146	85.38	25	14.62

for using Instant messaging apps among students.

Figure - V



It is clearly found from the figure that all the PG Student prefer Instant Messaging Apps of it easy to use (i.e. 91.81%) feature, cost effectiveness with 89.47% responses, time saving and easy to communicate more than one user in a single click (i.e. 78.95 and 85.38%). Responses had shown that all the PG students of IPS Academy response in yes in above reasons, the percentage of yes responses is proof the student's preference toward reason for using Instant Messaging Apps.

Table-VII: Experience towards Instant Messaging

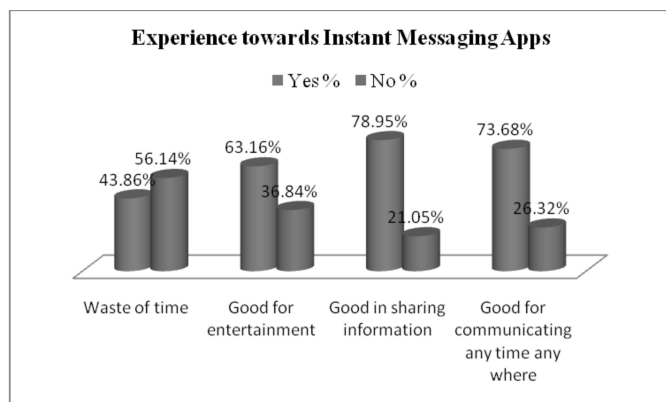
Apps

Instant messaging apps have different experiences on its users. By this question study is enable to view the experience in using Instant Messaging Apps on students.

Table - VII

Experience towards Instant Messaging Apps					
S.N.	Experience of the IM Apps	Yes	%	No	%
1	Waste of time	75	43.86	96	56.14
2	Good for entertainment	108	63.16	63	36.84
3	Good in sharing information	135	78.95	36	21.05
4	Good for communicating any	126	73.68	45	26.32

Figure – VI



Data shown from the figure that almost all the students are responding that Instant Messaging apps are good for sharing information, good for communication any time anywhere, as well as entertainment. 78.95% PG student's feel that Instant Messaging apps are good in sharing information. 73.68% student's experience that Instant Messaging apps are good for communication due to no limitation of time and place, 63.16% student's experience that Instant Messaging apps are good for entertainment. Only 43.86% students have opposite response i.e. Instant messaging Apps are wastage of time.

Table-VIII: Usefulness of the Instant Messaging Apps in Library Services

Library is a growing organism. Current age libraries are using various tools of Information Communication Technology to provide current information to its users. The use of Instant Messaging Apps in the Library and Information services take its service on new heights. By this question study facilitate to user's responses to in this regard.

Table-VIII

Table-VIII					
Usefulness of the IM Apps in Library Services					
S.N.	Usefulness of the IM Apps in Library	Yes	%	No	%
1	Message reminder for submission	132	77.19%	39	22.81%
2	For reminder before fine generation	126	73.68%	45	26.32%
3	For new arrival information	150	87.72%	21	12.28%
4	For arrival of reserved book	96	56.14%	75	43.86%

Usefulness of the IM Apps in Library Services

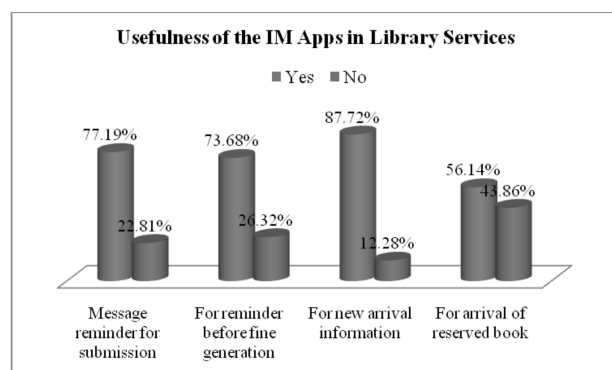


Figure - VII

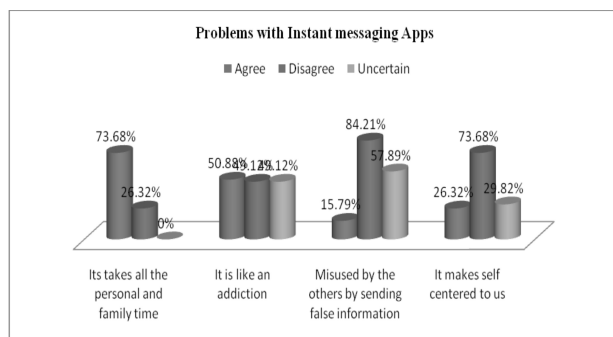
Data shown from the figure that, the information about new arrival is the highest preferred choice among students (i.e. 87.72%), message reminder for books submission and reminder before fine generation is the second and third highest choice (i.e. 77.19% and 73.68%). 56.14% students in favour for using IM apps for arrival information of the reserve book.

Table-IX: Problems with Instant Messaging Apps

Table - IX							
Problems with Instant Messaging Apps							
S.N.	Problems with IM Apps	Agree	%	Disagree	%	Uncertain	%
1	Its takes all the personal and family time	126	73.68	45	26.32	0	0.00
2	It is like an addiction	87	50.88	84	49.12	84	49.12
3	Misused by the others by sending false information	27	15.79	144	84.21	99	57.89
4	It makes self centered to us	45	26.32	126	73.68	51	29.82

Every coin always has two faces so Instant Messaging Apps also create some problems too. By this question study enable to sort ought the problems face by the students in using IM apps.

Figure - VIII



There are four choices for the student to respond problem with Instant Messaging apps. The responses shown from the figure that 73.68% student says that IM apps take all the personal and family time. 50.88% students feel that they feel addiction with this and can't live without using it. 57.89% students are uncertain about the information share on Instant messaging apps are true or not. 73.68% students told that Instant Messaging apps not make them self centered.

Table-X: Effect of Instant Messaging Apps on study and searching information

Effect of Instant Messaging Apps on study and searching information					
S.N.	Effect of IM Apps	Yes	%	No	%
1	To prepare assignments and project works	93	54.39	78	45.61
2	To know my subject very well and various	141	82.46	30	17.54
3	To update in the current development of my	123	71.93	48	28.07
4	To generate contacts which may be useful in	156	91.23	15	8.77

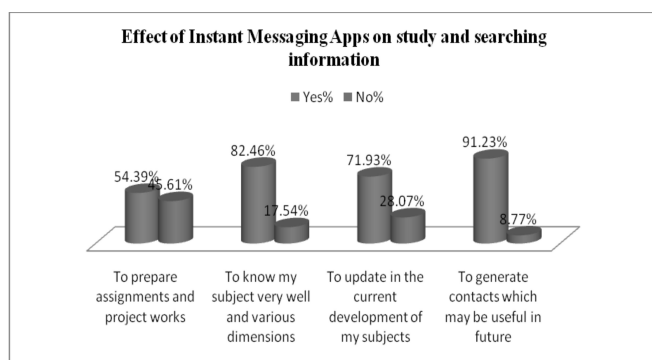
Instant messaging apps are good for sharing and communicating information. By this question we enable to find out the use of

Instant Messaging apps in study and searching information by the students.

Effect of Instant Messaging Apps on study and searching information

Figure – IX

There are various uses of Instant Messaging Apps, like preparing assignments and project works, current development of my subjects, generate contacts which may be useful in future and development of subject knowledge. 91.23% response in



favour of generation contact for future use. 82.46% students are feeling that IM apps are useful to know their subject very well in various dimensions. 71.93% students say that these apps are useful to update them in current development of their respective subjects. Use of Instant Messaging Apps in preparation of assignments and project works has lowest response i.e. 54.39% from the students.

Conclusion and Finding of the Study

1. Whats app and Facebook messenger is the favourite instant messaging app in the above list with same response

i.e. 89.47%;

- Hike is the second highest choice with 68.42% and Viber, IMO and Snapchat are on the third choice among students with 36.60%;
- Telegram is the highest (80.70%) preferred Instant Messaging App among students, Whats App on the second (70.18%) choice;
- Hike and Facebook Messenger are almost same responses from the students 57.89% and 56.17% simultaneously;
- IMO and LINE have almost same lowest responses by the students (26.32% and 29.82%);

6. 70.18% students are spending time on Instant Messaging Apps up to 4-6 hrs per week;
7. 56.14% student spends 2-3 hrs per week in using Instant Messaging Apps;
8. All the Students are very well familiar with Sending Video, Voice Message, Chatting, Text Message, Images and Photos etc, undelete message, Creating and deleting Groups and Enter in any group without permission of the Admin;
9. Main reason to use IM apps are it easy to use (91.81%). It need not any special technical training to use it;
10. Time saving and easy to communicate more than one user in a single click (i.e. 78.95 and 85.38%);
11. 78.95% PG student's feel that Instant Messaging apps are good in sharing information. 73.68% student's experience that Instant Messaging apps are good for communication due to no limitation of time and place;
12. 63.16% student's experience that Instant Messaging apps are good for entertainment.
13. The information about new arrival is the highest preferred choice among students (i.e. 87.72%).
14. Message reminder for books submission and reminder before fine generation is the second and third highest choice (i.e.77.19% and 73.68%).
15. 56.14% students in favour for using IM apps for arrival information of the reserve book.
16. 73.68% student says that IM apps take all the personal and family time.
17. 50.88% students feel that they feel addiction with this and can't live without using it.
18. 57.89% students are uncertain about the information share on Instant messaging apps are true or not.
19. 73.68% students told that Instant Messaging apps not make them self centered.
20. 91.23% response in favour of generation contact for future use.
21. 82.46% students are feeling that IM apps are useful to know their subject very well in various dimensions.
22. 71.93% students say that these apps are useful to update them in current development of their respective subjects.

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ABSTRACT :

Tremendous growth and diversification of knowledge in modern times have been recognized. The need of modern information society has changed the library from traditional type to automated and electronic one. Several factors like training of library professionals, fund, information policy, modern information technology etc. play a major role in automation. To retrieve the right information at right time by right user in automated or electronic library is more advantageous than traditional one and it is now well understood by librarian, technologist, management persons and others. So, in the changing environment, library organization may need to be revised to better support the growing number of electronic resources in its collection.

Keywords : Digital Library, Electronic Appliances, Networking, Management, Library Service.

Introduction :

The concept of library is going through a revolutionary phase due to the proliferation of electronic resources. Lot of discussions and writings have been made regarding library an electronic media to get a conclusion about what to do in the twenty first century of computerized era. It is supported that the libraries are at stake with-the challenges of electronic appliances are competitor or not.

It is to be clarified that neither electronic appliances nor the libraries are competitor to each other. Library, which is called now-a-days information centers, cannot be competitor and in this sense computerization is by no means greater than the library. More specifically, it should be noted that the computerized system is not all the information-centre-and-it-does not govern a library on the country; it is a machine, acting as preserver, and service provider. It is very much helpful to render the service of a librarian to the user quickly and authentically. The questions of users will get prompt answers at a minimum cost within minimum time. Computer will help to perform, duties more accurately and exhaustively according to revered Dr.S.R.Ranganathan. So despite the new challenges of electronic media, information centre or library and the computers will be made for each other. Rather the scope for more accurate and more comprehensive information may be extended to the users because of the super capacity of the computers. Electronic media is a prosperous system which will help to give the service quicker, authentic and trace of other related subjects may also be obtained from this. There is no doubt that the usefulness of different electronic areas highlights the sources of information.

Changing System :

There is certainly a transition period where manual system of library is switching over to the modern system. We are being acquainted with the terms: e.g. Website, E-aill, Internet, TQM, Digital Library, etc. In other words, these modern equipments and methods are more challenging, helping and modernizing to extend the facilities of the instructions to the information seekers which must be our motto. To fulfil this motto, we must have to prepare ourselves to devote our best possible effort to the users and for this we must enrich ourselves through proper training so that we may 'save the time of the reader'.

This proper training can enrich a librarian and an information scientist to deliver all available information in a systematic way to the users.

Moreover, their responsibility will increase as the information will be available easily and these can be published in book form easily and in a sense information centers will be good publisher also, which may publish rare books containing rare document. That is possible only because the computer itself can provide list of different types of information on different aspects and different types of various charts which are definitely of extreme importance for researchers, businessmen, students' etc. there are various types of subject areas for discussions under overall preview of LIS. But now a vital and relevant thinking about library and information profession at crossroads is being treated as urgent duty. However, this topic need be resulted after a spontaneous broad careful consultation to abolish the ambiguity regarding the topic to avoid lacunas, flaws and shortcomings in all respects of the application of computer science in library science field.

Library Services :

There is no doubt that any kind of library is to provide all kinds of essential services to the user according to their requirements. As computerization in LIS is a new thing, a strong well planned infrastructure is needed to modernize the whole system gradually. The infrastructure of the Indian libraries are based on the traditional system, the configuration to be adopted depends on the users library size, service and the number of the users.

In this modern era integrated multi-user library management system is the best contribution of information technology. These systems are no doubt powerful and not very tough to operate so that the library staff can use without knowledge of programming or computer skills. These systems almost minimize the activities of library staffs in acquisition (including initiation of titles, checking of duplication), approval method, placing of order, invoice, accession, and requisition of payment etc. cataloguing (including thesaurus, construction, facility of printed catalogue card, current awareness services e.g. bibliographies, list of recent documents etc.), an automated and simplified but flexible circulation system (including query and report facility on both users. Collection and circulation transaction). Above all, online catalogue, online searches on author, title subject and facility to prepare documentation list, bibliography etc. are also available to great extent from library automation technology.

Through there are very much facilities open up by the application of IT in LIS, the question is whether these facilities will be applicable and fruitful in a developing country like India where most of the villages are not still enlightened with education, do not have proper library facilities at grass root levels. Because, there is tremendous poverty due to low economic standard this is also a vital problem to avail and implement all modern opportunities. On the other hand library has a great social responsibility in developing and enriching the country as an agent to spread education through-the use of information technology. This technology will also educate common users to acquire requisite information. General people will get opportunity in having information about all types of knowledge, all types of subjects through Internet connection and through different software packages.

Library is the best place to encourage common people to interact with computer, E-mail, and utility of different packages which will help the consumers to have their necessary information irrespective of village people and town people. We must see that mere storing and retrieving information is not the only purpose of a library; dissemination of this information will play an important role for advancement of education. Library can only provide referral as well as substantive information in the form of bibliographies, and photocopies of the relevant documents. Computer, multimedia, Internet, different forms of information resources will provide all such information in a centralized process which will be easily accessible and exploitable in fact, information technology will accommodate the increased workload, connect the libraries of different places, decentralize the whole library system and integrate both the users and the library professionals. This will make true to the truest sense of the five laws of Dr. S.R.Ranganathan. For achieving highest effect for library network and information retrieval a well-planned framework and infrastructure have to be framed by the librarians, information

technologist for library automation according to the need and capacity of the respective library. Besides, in this age of information explosion or knowledge explosion information technology is the boon to solve the problems. For this one has to plan for a series of activities which the information centre requires i.e. to provide basic facilities for consumers for wide access to libraries

- To frame an integrated library and information management system which can bring powerful automatic resource control to provide library personnel with more time to devote for other specialized tasks.
- To choose library automation software carefully so that it consists of maintenance facility of authority files, auto-cataloguing, website service on cataloguing, auto import-export service from various websites, auto keyboards, MCR2 card format (multilingual), Bar codes, book bank management, internet system, correspondence kit, E-mail, Internet access etc. for creation of library database of collection of books, serial holdings, bibliography networking and placement of database on websites.
- To serve this changing society based on information technology of twenty first century, traditional concept of library education obviously requires overhauling. A comprehensive professional training program, emphasis on information technology should introduced immediately throughout the country which will prepared them to be self-sufficient in handling the new challenging media, equipment and technology and to improve the whole library system. However, the librarian or library manager should also take part in development programme for the illiterate, underdeveloped people of this developing country like India which is over populated (over than one hundred crores) where poor people are constrained to sale their child in lieu of money till today, where woman can be burnt or declared as witch by the fellow people. Here the libraries especially local libraries have great role to do something for the advancement of society and to eradicate illiteracy, to overcome all these superstitions, barriers, unhealthy atmosphere.

Conclusion :

It is important to feel at this juncture that societal change, technological change, and cultural change is going on. So the change in technology will be in each and every room like the television has taken its place in our daily livelihood. This change will also be in the libraries. We will have to accept it promote it effectively, efficiently, skillfully to abolish the difference between the rural and-urban people is access of information and education. We should unite public library movement, adult education movement and eradication of illiteracy movement to develop in enlightened society which will be able to utilize and exploit the modern library systems and its services. This can be possible in rendering library service by the librarian through the implementation of new technology and rearranging, restructuring, re planning and redesigning the provisions and methods for working for the society. If the financial position is not sound, minimum possible arrangement may be implemented in initial stage. But, the problem of investment remains in undeveloped and underdeveloped countries yet India as a growing competing country in science and technology should allocate adequate money on the basis of a top management planning as to even a backward village can also avail the facility. The changeover from manual system to computerized system in library and information centers can be implemented from grass root level to highly modern libraries also for resulting electronically oriented equipped libraries and infirmities centers in all over India. Prerequisite for bring such a radical change in our society is to strengthen our public library system so that in future there should be no information rich urban society and information poor village society but information will have to be disseminated and consumed homogeneously by all sections of the people of the society. With the development of ICT there is a sea change in the library scenario. To face the challenges of information explosion, librarian or information scientist will have a great task to do. Besides their regular work, they will have to kept informed of technological developments, educate users, procure collection from all front. To avoid misuse of information they should acquire information processing skills, information management skills.

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ABSTRACT :

Grey literature is everywhere, consisting of documents that are not formally published through typical scholarly channels. Importance of this primary source of information is no way less to any other form of information, what we call as Grey Literature. It is an important source of information to students and researchers in different areas of study. The present paper highlight about Gray Literature.

Keywords : Grey Literature, Institutional Repository, ETDs, Seminar Papers, Study Materials, Standards, Patents.

Introduction :

Studies on access and usage of grey literature have attracted wide attention from many parts of the world. Literature on its originality, relevance in the development of science and in solving societal problems, especially from the developed countries is immense. In the developing world, it has started to gain prominence, especially in higher learning institutions and research establishments. In the course of its evolution and historical development, the term “Grey Literature” has co-opted many terminologies in its meaning, which are used interchangeably with it. Professionals such as librarians, researchers, and the intelligence community have been using the term “grey literature” to refer to an extensive body of information material that cannot be found easily through conventional channels such as publishers, but which is frequently original and usually recent and provides high quality information (Debachere, 1995). According to (Cooper, 1994), grey literature reports on extensive research, landmark experiments, comprehensive surveys and detailed investigations. Researchers, students, practitioners and academics are aware that a great deal of valuable information on research and practice is never published in the conventional manner. Thus, redefined and edited versions may appear after a lengthy delay in journal articles or books, but in many cases the original report, paper, or dissertation is the only source. Grey literature, therefore, is often at the cutting edge of what is new (Smith, 1996). This view is also shared by Auger (1998), who highlights the fact that these documents present a number of advantages over other means of dissemination. These advantages include greater speed, greater flexibility and the opportunity to go into considerable detail if necessary. Indeed, grey literature covers nearly every aspect of the sciences and provides scholars and lay readers with research summaries, facts, statistics and other data that offer a more comprehensive view of the topic of interest (Weintraub, 2006).

Definitions of Grey Literature :

The exhaustive and unequivocal definition of the nature and types of material qualified to be defined or described as grey literature could probably form the basis of understanding it. However, there is no certain means of developing a universally-accepted definition or description of grey literature. Grey literature is a term that is probably not widely understood outside the world of librarians in the natural sciences and social sciences. Even within this circle, there are varying degrees

of agreement and consensus on what constitutes grey literature (Tittlett & Newbold, 2006). Scholars such as McKinney (2005), Der Heij (1985), Aina (2005) and Smith (1996) Wood (1982) have analysed the literature tracing the development of definitions as well as a general description of the term “grey literature”. The definitions and descriptions provided will demonstrate how hard and awkward it is to find a comprehensive definition and description.

The term “grey literature” is not new and, perhaps, most people know it by other names. Historically, grey literature is a product of an evolutionary development rooted in the twentieth century science and technology, often being associated with many names. Van der Heij (1985), for instance, noted that synonyms for “grey” as used in the professional press include “fringe”, “ephemeral”, “fugitive”, “informal”, “informally published”, “unconventional”, “unpublished” and “invisible” literature. Such literature, as indicated earlier, has also been known generally as “report literature” (McKinney, 2005).

Auger (1998), however, opposes the use of the term non-conventional when it comes to grey literature and, instead, states that “documents may be unconventional in many ways and many conventionally published documents show greyish aspects”. He argues further that “some of these items are conventional in appearance and can be acquired by placing subscriptions or orders through agents and booksellers”. Some people relate it to a situation or a topic that does not fit into a particular category and is, therefore, difficult to deal with (Tella, 2006). In Europe, for instance, the term has become widely recognized and used as evidenced by German “graue Literatur”, the Italian “Letteratura grigia” and the French “Litterature grise” (Auger, 1998, Malinowska, 2006), which all imply not published. In the United States, the term has taken longer to be accepted. According to Auger (1998), the term originated from the British librarians and supplanted the longer established American term “reports literature”.

Auger (1989) and Malinowska (2006) trace the birth of “grey literature” to “report literature”, its forerunner, as the term grey literature only gained currency in the 1970s (Alberani, 2000). In the UK, as noted by Alberani (2000) and Auger (1998), the starting point for the endorsement of the terminology started at a seminar on grey literature held in York in December 1978. The seminar was organized by the European Economic Community, now the European Union, in co-operation with the British Library Lending Division, now known as the British Library.

The most useful and a widely accepted minimal definition before the 1990s was that of Wood (1984), who defined it as “material, which is not available through normal book selling channels”. As well as being the subject of haphazard or specialized distribution arrangements, grey literature also has a number of other distinguishing characteristics such as a small print runs, variable standards of editing and production, poor publicity, poor bibliographic control, and poor availability in libraries (Wood, 1984). Gibb and Phillips (1978) defined grey literature as material which, in its manner of publication, is “non-conventional”.

McKinney (2005) questions the use of this definition since it is “too inclusive” and likely to cover something ephemeral or a printout from an online search, but can exclude literature often be obtained from vendors which are by definition grey literature (McKinney, *ibid.*). Der Heij (1985) defined grey literature as written materials not issued through regular channel. Similarly, Smith (1995) defined grey literature thus: “Material which cannot readily be acquired through normal bookselling channels, which therefore escapes listing in bibliographies and in print tools, and which is therefore difficult to identify and obtain.” Attempts to re-define grey literature to take into account new developments include the one which came out of the 1996 Grey Works Workshop. This definition refers to non-conventional literature considered to be publicly available information, which may not be available through normal channels or systems of publication and bibliographic control (Smith, 1996). The US Interagency Grey Literature Working Group (IGWG 1995) has defined grey literature as foreign or domestic open source materials that are usually available through specialized channels and may not enter the normal channels or systems of publications, distribution, bibliographic control or acquisition by booksellers or subscription agents (IGWG, 1995).

Charecteristics of Grey Literature :

According to Sakaguchi (2009), Tella (2006), Natarajan and Bhakta (2007), grey literature has the following characteristics:

- (i) Not primarily produced for commercial publications, producers of grey literature have traditionally been non-commercial publishers. The main suppliers of such grey literature include government organizations, universities, for whom the publications of reports, newsletters, theses and dissertations serve as a means of disseminating information across, rather than publishing as a commercial venture.
- (ii) Non-conventional diffusion.
- (iii) Lack of standard bibliographic control, and thus it is difficult to estimate their output, for example in terms of ISSN and ISBN.
- (iv) Short life-cycle of documents.
- (v) They are produced in limited copies or small print runs. This often results in their being issued largely in mimeographed format.

Generally, grey literature normally contains the most recent information that cannot be found in other sources, and is intended to complement.

Types of Grey Literature :

Grey Literature refers to publications issued by government, academia, business, and industry, in both print and electronic formats, but not controlled by commercial publishing interests, and where publishing is not the primary business activity of the organization. Scientific grey literature comprises newsletters, reports, working papers, theses, government documents, bulletins, fact sheets, conference, proceedings and other publications distributed free, available by subscription, or for sale (Ramadevi, 2006). The quest for scientific knowledge is an evolutionary process in which every increment of new knowledge adds to, modifies, refines, or refutes earlier findings (Subramariyan, 1981). Scholarly, peer reviewed journals are the major venue of communication for the science community to publish and present results of current research to colleagues. Since research tends to focus on specific areas of a discipline, readers often desire additional information to help place the research in a wider perspective. Auger (1989) pointed out that the advantages of grey literature over other means of dissemination are quick access, greater

Flexibility, and the opportunity to go into considerable detail when necessary. Thus, grey literature, covering nearly every aspect of the sciences, serves scholars and lay readers alike with research summaries, facts, statistics, and other data that offer a more comprehensive view of the topic of interest.

M. C. Debachere (1995) has written that it is easier to describe, rather than define grey literature. Collectively the term covers an extensive range of materials that cannot be found easily through conventional channels such as publishers, “but which is frequently original and usually recent” Peter Hirtle in *Broadsides vs. Grey Literature* defines it as:” The quasiprinted reports, unpublished but circulated papers, unpublished proceedings of conferences, printed programs from conferences, and the other non-unique material which seems to constitute the bulk of our modern manuscript collections”

For the institution from where it originates, the literature variety is not grey or inaccessible. It is not widely publicized because the originators perhaps hold the view that it is of little value to others, and to some extent it is secretive in content. Dasgupta (1983) refers to DEVSIS study team which studied only six selected categories of grey literature varieties generated in India,

In the area of socio-economic development. The six varieties selected for the study were;

- Government documents
- Project feasibility reports
- Working papers
- Research reports
- Seminar papers and
- Statistical documents

Grey literature is literature (often of a scientific or technical nature) that is not available through the usual bibliographic sources such as databases or indexes. It can be both in print and, increasingly electronic formats, and in their purview the following types are covered.

- Technical reports
- Preprints/Reprints
- Fact sheets
- Standards
- Patents
- Working papers
- Committee reports
- Newsletters / Bulletins
- Government documents
- Conference proceedings
- Symposia

Such of these Grey literature is by and large, produced by government agencies, universities, research centers, associations, societies and professional organizations (Gokhale, 1999). In GL 95 Conference it is stated that the term is expanded to include the broad category of ephemera because, according to Library of Congress subject headings, works such as reports, theses, conferences papers, translations and limited circulation government documents are all subject terms for grey literature, with printed ephemera being the broader term. Di Cesare and Sala (2008) have categorized the various types of grey literature as Light Grey, Medium Grey and Dark Grey according to their estimated availability and accessibility.

On a very formal level a report is a document which gives the results or the progress of a research and/or development investigation. GL where appropriate, it draws conclusions and makes recommendations, and is initially submitted to the person or body for whom the work was carried out. Commonly, a report bears a number which identifies both the report and the issuing organization.

Reports, in fact, are characteristically the products of organizations, and will vary widely in style and method of publication. As will be seen later they may range from a few pages of technical notes to multi volume works describing the development of large projects. Many users would agree that report is incapable of strict definition, particularly when considered in relation to similar publications such as, for example conference papers.

Role of Library Professionals :

Normally it has been observed that, technical reports are always found in good number in almost every type of library. The libraries concerned with engineering, R & D, Agriculture, Medicine etc. and various other specialized libraries possess this type literature in abundance, but to our sorry state, this literature remains mostly wanting for the lack of attention. Grey literature rarely come under bibliographical control, mostly due publication of limited number of copies and the Classifying, Cataloguing, Shelf arrangement of the same is not mostly taken seriously, which otherwise should have been, in view of its importance. Status of the libraries in Indian subcontinent is a bit more worrisome, as these supplements mostly remain unrecorded and unattended and later get destroyed as trash. To overcome this problem, library professionals need to put up an effort towards organizing these conventional sources of information. All this will help a great deal in bringing awareness about the use and importance of Gray Literature as that of other primary sources of information.

Role of Grey Literature in Research :

Grey literature plays an important role in today's complex socio-economic and academic environment. As Weintraub (2008) has observed, grey literature provides scholars and lay readers alike with research summaries, facts, statistics, and other data that offer a more comprehensive view of the topic of interest. According to Weintraub (ibid), a world in which free trade and instantaneous communication have eliminated many of the barriers to information flow, grey literature is increasingly gaining greater importance as a source of information for much of the world's population: it covers all segments of knowledge; it serves the informational needs of various people from different disciplines. Such information is an important input for the success of any academic and research system.

When conducting scientific research, for example, it is pertinent to include grey literature in the literature review in addition to information gleaned from peer reviewed journal articles to enrich the findings since grey literature is more likely to contain primary data than any other source. The inclusion of grey literature in research makes research results and conclusions more accurate and comprehensive. In fact, the absence of this kind of information can restrict researchers; lower their confidence, their professional standing and even the value of research. La Fleur and Rupp (2005) have argued grey literature is an important part of the communication process despite appearing to be separate from mainstream publishing. Osayande and Ukpebor (2012) have noted further that, generally, grey literature is the main source of indigenous information, and, therefore, it is very relevant in carrying out researches that are home-based. In fact, lecturers, researchers and students in universities rely heavily on materials such as these, projects, and conference papers, to gain firsthand information on topics under study. Other benefits are that grey literature is more likely to report studies that ceased prematurely, as well as innovative pilot projects (Osayande and Ukpebor, 2012).

Grey Literature in India :

Grey literature refers to an extensive range of materials that cannot be found easily through conventional channels such as publishers, but which is frequently original and usually recent. It is produced more quickly and has greater flexibility. Grey literature comprises newsletters, reports, bulletins and so on. It has tremendous importance in all fields of knowledge. In India, there are Many State universities and open universities. These Universities generate a voluminous amount of grey literature-Theses, dissertations, and working papers, technical reports, bulletins, self-instructional material, audio, video material, radio broadcasts. Such documents contain very valuable and often detailed information like observations, conclusions, analyses and primary data, which constitute intellectual capital of the universities. These publications are not accessible to the scientists and academicians outside that particular university. The present study suggests a model for providing accessibility, thereby facilitating visibility, and legitimacy to the grey literature, which is generated at universities in India.

Suggestions :

- Awareness with the help of various publications of library & information science can do a commendable job in making people realize its importance and its organization and exploitation thereof.
- UGC can help a way in compiling a database of grey literature available in all recognized universities and colleges of the country.
- Various library networks like DELNET, CALIBNET, ADHINET can prove equally good in offering grey literature services
- Library associations of India like, ILA, IATLIS, and IASLIC can play a pivotal role in tapping this huge information by creating awareness firstly among working librarians, secondly by organizing various seminars, symposia, conferences, workshops on this theme.

Conclusion :

Almost every institution or organization globally at individual level is producing huge amount of grey literature and people most of the time despite realizing its use value are not able to reap benefits from it. If the same piece of information is made available through commercial publishers, the process with which people are more familiar and conscious of making use of. The same information will produce exceptional results in their relevant fields. There is also need to bring awareness among general masses about the importance of grey literature. Libraries especially those associated with academic and research organizations are playing a vital role in preserving and exploitation of grey literature. Production of scientific results in the form of grey literature is always in abundance but the fact is, same remains confined only up to the scientific community and need is to help it get used where ever needed.

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ABSTRACT :

The study attempts to know the level of satisfaction on library services via online feedback forms available through library website. Library enriches the collection as per the users need. Marketing of library services and products through library website is an effective media in digital environment. The study attempts to know the awareness among users to use the online resources. Library should provide innovative services to attract more number of users in the library. User orientation program and e information literacy program is the must to make them aware all the resources. Analysis shows that still more efforts are required to increase the usage of library resources and inculcate reading habit among them. Every time we speak to a person, employee, customer, vendor, etc., we communicate feedback. In actuality, it's impossible not to give feedback. Feedback works best when it relates to a specific goal. Feedback is often mistaken for criticism. In fact, what is viewed as negative criticism is actually constructive criticism and is the best find of feedback that can help to formulate better decisions to improve and increase performance. Study found that maximum users are satisfied with library services and resources. Based on the findings it was also recommended the library infrastructure plays important role to attract the users apart from library services and products. A separate E information literacy programme should also conduct separately, especially for PG Students, Faculty and Research Scholars.

Keywords : User Needs, User Assessment, Online library feedback, Evaluation-Library Services, User Expectation – Library Services

Introduction :

Library is a brain of the institution. The modern library is now generally called an information center and the library user is a consumer of information. Information is a vital resource for research and development of any nation. The library should give priority to provide excellent customer service enhancing its image as information provider in the information era. The new users do not know about library rules and regulations; therefore, it is the duty of library staff to give orientation for maximum utilization of library. The user is the ultimate judge of the quality of service. User gives feedback about the quality of services and products in various sections of the library. (Chaudhury, 2014)

Libraries are challenged to provide greater information access & improved levels of services, while coping with the pace of technological change and ever-increasing budget pressure.

The college library not only provides stimulus to reading by procuring materials for study and research, by introducing open access system, by providing long hours to open, by organizing the library resources in a systematic way but also supports the intellect of the student, encourage the researchers of the faculty and themselves the teaching and research needs of the faculty.

Feedback of any of the services is required to evaluate them. Library can come to know which service is most popular and

user need what type of resource maximum in the library. Subscription of online print journals is also depending as per the usage and feedback given by the users, minimum use of periodicals can be stopped or replace with new one as per Users demand.

Library keeps on changing the management and administration to sustain in digital environment.

Now a day's Users think that everything is available on google and smart phones so no need to go to the library for any information. Library has to put an effort regularly to attract more number of users by providing innovative services like conducting book review competitions, Best Library user award, celebration and display of important personality books, arrange book exhibition, book talk etc.

The term 'feedback' is used to portray the helpful information or criticism about earlier activity from an individual conveyed to another individual who can utilize that information to adjust and enhance present and future actions and behaviors.

Effective feedback, whether it is positive or negative, is extremely helpful. Feedback is significant data that will be used to make important decisions. World class libraries takes feedback from their patron's periodically to improve their services constantly to satisfy their patrons need. Feedback is helpful only when it highlights weaknesses as well as strength.

Continued feedback is important across the entire organization in order to remain aligned to goals, create strategies, develop products and services improvements, improve relationships, and much more. Continued learning is the key to improving.

If effective feedback is designed into a performance management program, individual and team performance will improve, which will make the organization more effective. With effective feedback processes, employees won't be working blind and, hopefully, will reach their destinations successfully.

Objective :

- To find out the user awareness about the online resources and traditional services provided by the library
- To find out the level of satisfaction among the users
- To find out the preferred library services and collection
- Evaluate the library services
- Identify the weakness of the library

M.D. College Library at a Glance :

Maharshi Dayanand College of Arts, Science & Commerce College is affiliated to University of Mumbai, founded in 1962. College offers Degree courses in pure Arts, Science, Commerce stream and various professional courses like BMM, B & I, B.F.M, Computer Science, BMS & BAF. Post graduate degree in Commerce and Chemistry is offered. Apart from that Research Scholars in the subject Commerce, Chemistry, Zoology, Mathematics, Hindi and Gujarati subjects. Library is also founded in the same year.

Total collection in the library

Total Books	44000 books
CD/DVD	600
Map/Atlases	12
Newspapers	22
Periodicals Popular	35
Academic Journals	45
E resources	UGC NLIST & DELNET

College library provides facility of interlibrary membership's i.e. British Council Library, Indian Merchant Chamber, Maharashtra Economic Development Council, Insurance Institute of India, Bombay Natural History Society.

Review of Literature :

(Lewis, 2014) The University of East Anglia (UAE)'s library take feedback very seriously. Once they received written comment from a group of students asking collaboration between library induction sessions and IT for better understanding of technology in learning process. After this suggestion, East Anglia library start digital literacy skills, including the use of tablets and iPads in learning within their core library information skills training.

(Dhamdhare, 2012) focused on how academic libraries are changing with this new web technology and how librarians are handling challenges in the digital era. Article mentions that librarians and library staff behavior should be user friendly. Library should have internet and Wi Fi facility, library portal and blog, institutional repository, e learning, library orientation and information literacy.

(Wills, 2014) investigated the study on best practices starting a summer reading programs for the very young. She included activities from each student of the five practices talking, singing, reading, writing and playing. She developed booklist to distribute to participants. She involved books for babies, toddlers & preschoolers, based on the summer's theme.

(Prasad, 2010) had given the guidelines on quality indicators in library and information services, collection and services provided to users, extent of the use of services and best practices for college libraries.

In order to set up user centered service the library needs to know the users and user needs. User survey is the main tool that can be used to evaluate and assess the library services to sustain in volatile competitive environment. It is impossible to assess the changing needs of the clientele unless user surveys are conducted to determine user needs and their reading interests. (Gunasekera, 2010)

LibQUAL+ is a web based survey offered by the association of Research Libraries that helps libraries assess and improve library services, change organizational culture and promote the library. The survey instrument measures library users' minimum, perceived and desired levels of service quality across three dimensions: Affect of service, Information control and library as Place. LibQUAL+ is not free; one has to subscribe these tools for in depth analysis.

LibQUAL+ gives your library users a chance to tell you where your services need improvement, so you can respond to and better manage their expectations. You can develop services that better meet your users' expectations by comparing your library's data with that of peer institutions and examining the practices of those libraries that are evaluated highly by their users.

Scope & Limitation of the study :

This is a case study of M.D. College library. Only those users who gave their feedback online will be taken for analysis. These users are regular library users. Users include junior level students, Undergraduate students, Post graduate students, Faculty members and Research Scholars. Detail studies on use of e resources are not taken under this survey that will be studied separately. Total 369 responses received during the period 1st August 2016 to 31st Oct. 2017.

Methodology :

Online feedback form created in Google form are given link to M.D. College library website and users were asked to fill the form online throughout the year. Feedback given by regular library users only because library borrower ID is must to fill the form. Google form is created as per different services provided by the library.

The survey was used to measure satisfaction with library collection, services, facilities, infrastructure and technology.

Valuable information from these surveys was gathered. The survey was voluntary, library inform the users during user orientation program to give their valuable feedback about the library.

Data Analysis :

Online feedback form data stored in excel file and create various charts and graphs accordingly.

Qualitative data analysis :

The survey provided opportunity to the users to write comments, suggestions, complains and any other library related matter. Total 138 responses received. The open-ended questions were optional. All the questions are not mandatory to answer; therefore, we got different responses in different questions. One question was asked to give the suggestion to improve the library services. The most common open-ended responses were compliments to library and library staff. Users reported good environment for study. Some negative comments also received and reported in findings of this study.

Quantitative Data Analysis :

Effectiveness of Library services (Table 1) –

Rating	Percentage	Number of Respondents
Lowest 1	7.7%	24
2	6.8%	21
3	15.9%	49
4	34.6%	107
Highest 5	35%	108
	100%	309

Table 1: Effectiveness of Library services



35% (108) users gave high rating to the library, while 7.7% (24) users gave lowest rating to the library.

Table 1: Effectiveness of Library services

Figure 1: Effectiveness of Library services

One question were asked whether they are using other library in the city and 69% (254) users (out of 369 responses) gave negative reply while 31% (115) users named the library as Lalbagcha Raja Library, Mumbai Marathi Granth Sangrahalay, Siddhivinayak Trust Library , Swantraveer Sawarkar Library and University of Mumbai, Kalina Library. Some of the science faculty are using Institute of Science library for reference.

Overall Impression about the Library :

Total 317 responses received for this question. 88 (27.8%) reported excellent library, 122 (38.4%) said very good,

81(25.5%) reported Good library, 22 (6.8%) respondents gave average impression about library.

Figure 2: Overall Impressions about the Library :

Purpose of using UGC-Network Resource Center (299 responses)		
Check OPAC (Library Catalogue)	95	31.8%
Fill the Scholarship Form	113	37.8%
Check College Website for updates	154	51.5%
Access online Journals	140	46.8%
Take Printouts	192	64.2%
Check CD/DVD available in the library	55	18.4%
Past Time	73	24.4%
Information Search for project preparation	243	81.3%

Overall impressions about the Library

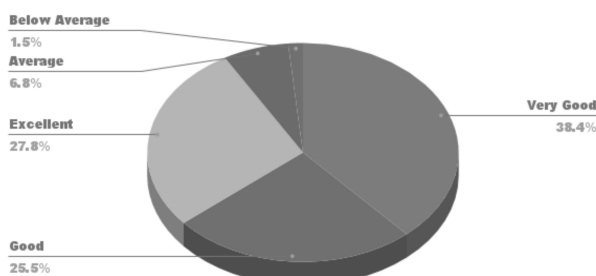
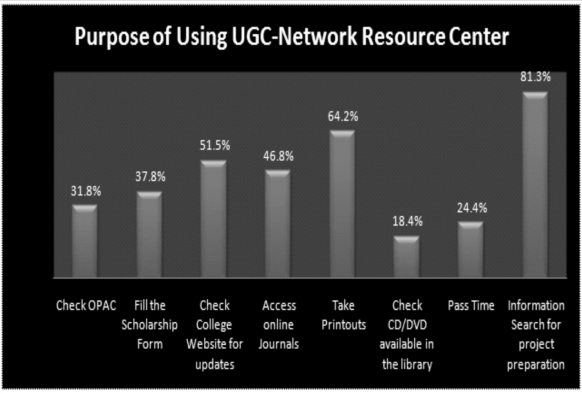


Table 2: Purpose of using UGC-Network Resource Center :

Library has free internet facility provides ten computers to the students and staff. A separate record has been maintained for UGC-Network resource center to find out the purpose of using the same. Total 299 responses received for this question. It was found that 64.2% users come to take printouts, 81.3% utilize internet section for information search, 46.8% access online journals and E resources & 31.8% come to check online library catalogue. Library web-OPAC is available during working hours, so users can check library catalogue throughout the campus and also in smart phones.

Figure 3: Purpose of using UGC-Network Resource Center



21.6% are strongly agreed (SA) about good physical facilities and 42.8% are just agree (A).7.4% are disagreeing (SD) about physical facilities.

Figure 5: Perception about the Library Collection

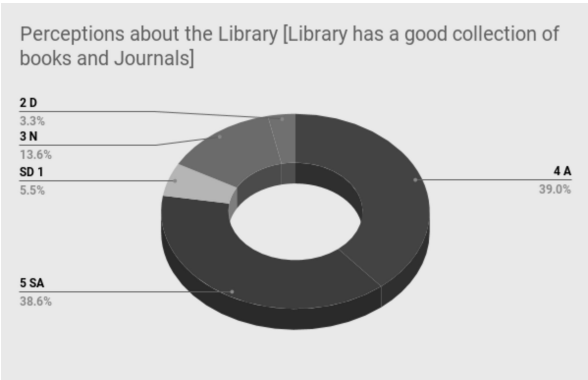


Figure 6 shows the level of agreement about the Internet facility available in the library. 47.5% are strongly agree (SA), 34.3 % are agree (A), 4.9% are strongly disagree (SD) and 5.3% are disagree (D) about net facility.

Table 3: Purpose of Using Library Services Purpose of using library services (353 responses)

Table 3: shows the purpose of using the library services. Data indicates that maximum users come to the library for text books. 78% comes to refer subject books. 69% like to read newspaper and current magazines available in the library. However, a large number of students i.e. 67% are coming to read with their own notes in the library. 29% like to access E resources available in the library.

Figures 7 receive total 269 responses, out of which 29.4% are strongly agree (SA) about good signage's.41.3% are agree

1 - SD = Strongly Disagree; 2 – D = Disagree; 3 – N=Neutral; 4-A=Agree; 5 –SA=Strongly Agree

Figure: 4 Perception about the library about physical facilities

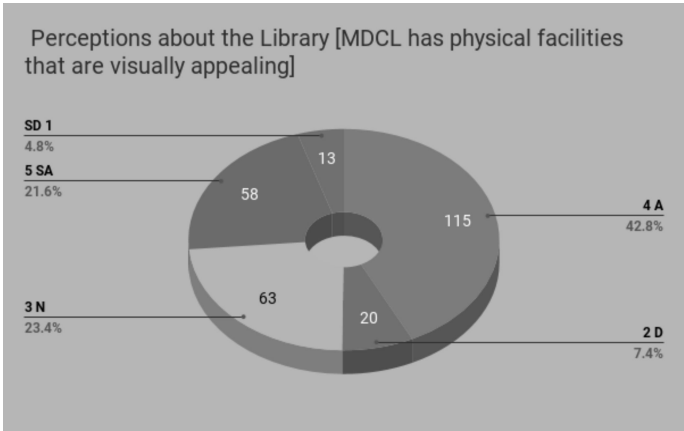
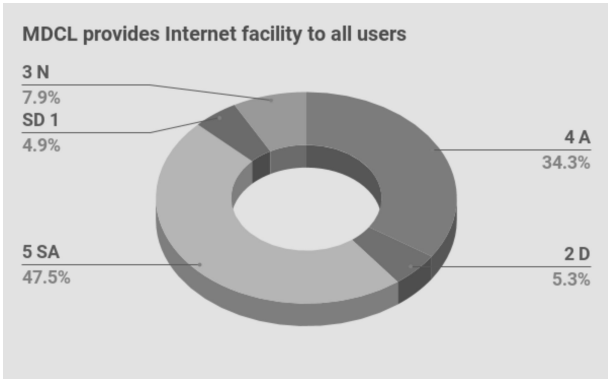


Figure 5 shows the perception about library collection. 38.6% are strongly agreed (SA) & 39% are Agree (A), while 5.5% are strongly disagree (SD) with collection.

Figure 6: Internet facility in the Library



Purpose of using library services (353 responses)		
Purpose	Number of Respondents	Percentage
To read Text Books	305	86.4
To Refer Subject Books	277	78.5
To refer Career Guidance books /General Books	161	45.6
Issue/Return Books	215	60.9
To Refer Dictionary/ Encyclopedia	140	39.7
To read own notes	237	67.1
Prepare for participation in Co- Curricular activities	90	25.5
To spend free between lectures	143	40.5
To consult previous year question papers	156	44.2
To refer syllabus	197	55.8
To access E resources	103	29.2
To read newspaper and magazines	244	69.1
To refer current journals	132	37.4
Other Purpose	34	9.6

Suggestions and Findings

Following suggestions/ comments/complaints received from the users-

- Extending library working hours during weekdays
- Open reading room during holidays and Sundays throughout the year
- Students want to take library books during summer vacation till college reopens for next academic year.
- Library should be silence Zone.
- Old text books should replace by new one.
- Students found it difficult to search books which are kept in back shelf due to space crunch.
- Duration of home issue books extends to two weeks for UG students.
- Restructuring of space to provide group study area in the library
- Students also requested to use social media sites in the library internet section.

Conclusion :

Analysis of feedback is necessary to improve the library services. Users are enthusiastic to fill the online forms rather than print paper. Library saves lot of paper every year. A separate E information literacy programme should also conduct separately, especially for PG Students, Faculty and Research Scholars. College libraries need to have facilities that

(A) to that library has useful signage's. 4.5 % users are disagreeing (D). Library should look into these responses and try to improve the situation.

Figure 7 : About Library Signage Boards

Librarian conducts Library orientation program every year in between June – August in classrooms and also in the library itself. All the students who have attended this program will be provided UGC-NLIST login and password to use the E resources.

One question was asked whether they have attended library orientation program in the library or in the classroom. 49% of the users gave positive reply. Out of 49% users 30% said this program is extremely necessary for effective utilization of library services and products.10% said it is necessary and 9% said it is somewhat necessary.

promote effective and interactive access and use of information resources for all users. The libraries need to offer best possible services in comfortable, decent, well lighted healthy environment with adequate and appropriate seating arrangements to ensure optimum utilization of library services including online resources. The libraries should have clear policy of copyright issues, rules and regulations with regard to hours of access, location of books, class numbers of books and other regulations to offer better services to the users. Library should provide innovative services with a good ambience to attract the users. Study found that maximum users are satisfied with library services and resources. Based on the findings it was also recommended that library infrastructure plays important role to attract the users apart from library services and products. Library keeps on adding books suggested by the users if it is relevant and not in the library. Study also found that library resources and services are not being fully used by the users because either they are not aware of the services/ resources or do not give value to the library.

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ABSTRACT :

Design thinking is a process for problem-solving. Unlike analytical thinking, design thinking includes “building up” ideas, with few, or no, limits on breadth during a “brainstorming” phase. This framework explains how the Six Thinking Hats (by Edward De Bono) helps in performing the managerial functions effectively and efficiently. Management consists of activities undertaken by one or more persons to coordinate the activities of other persons to achieve results not achievable by any one person acting alone. Management generally refer to the process of accomplishing objectives with and through others. A Library Manager who is well versed with the theory of management may be able to do his / her duties effectively and efficiently. Thus in order to perform these roles, the Library Manager must acquire managerial skill. This paper highlights the co-creative with principle of management and Edward De Bono’s Six Thinking Hats in the daily functions of the library.

Keywords : Library Manager, Creative, Six Thinking Hats, Innovation, Library Management.

Introduction :

Library Management is the term which is familiar to almost everyone as a process or an activity that brings together several resource like persons, material, techniques and technologies to accomplish tasks. These tasks may pertain to performing a variety of functions of an organization like college or a library . The managerial skill for the Library Manager are divided into three categories - Technical Skills, Human Relation Skills and Administration Skills.

Technical Skill :

Libraries require latest technologies to fulfil the User’s requirements and Library Manager must know, how to implement these technologies in the daily library activity for better outcome.

Human Relation Skills :

Team Building, Interpersonal Relationship, Communication and Motivation Soft Skills are the foundations on which SHGS are built.

If Library professional is equipped with these soft skills, they can play an important role in the knowledge transfer process.

GNIMS Library team have good interpersonal relationship soft skills with Library Users.

Administration skills shows the leadership skill to monitor regular performance by team and continuous evaluation of the theme for the growth of the organization.

Function of Library Management :

Management is a process or an activity that brings together varied functions of the organization. All managers should perform all managerial functions of POSDCORB. Let us discuss these seven function of management :-

1. **Planning and Organizing Corresponds to White and Green Hats:**

White Hat thinking is a discipline and a direction. The thinker strives to be more neutral and more objective in the presentation of information. So it deals with facts, information, objectives and right direction for achieving the goal. Green Hat is for creativity, new ideas and search for new alternatives. Combination of these two hats leads to a well organized plan.

Planning :

In any organization planning is the first function performed by the manager and in the library this role is performed by the Library Department, which have to mix with the Objectives of the Institute / Organization. The planning of an organization involves developing objectives, strategies, policies, procedures programmes etc.

Organizing :

Second task for Library Manager is to determine and identify the activities needed to realize the plan, separate them into blocks or departments, put them in charge of specific groups of personnel's. This is the task of organization. The need for Organization is indicated by the principle of division of labour.

Research Activities of the Library like conducting Annual Research Seminar/Conference for their thirsty researcher and also to fulfil their academician need. These Seminar /Conference aims to bring together Academics Researchers and Industry Practitioners on a single platform to review research in the domain of Library and Information Management at different levels and recommend strategies for improving the quality of library and information management Services.

2. **Staffing : It Correspond to Yellow and Red Hat:**

Yellow Hat: It deals with positive thinking. A successful and progressing organisation has a staff with positive thinking.

Red Hat : It deals with emotions and feelings . A boss who cares for his staff will always get a good result.

In the organizing process, staffing is an important managerial function. It deals with job and person matching in organization. Staffing covers the principle topics of job analysis, recruitment, election and induction for new staff time to time, appraisal and counseling manpower and development and training programmes.

It is the duty and responsibility of a Library Manager to wear a Yellow Hat and create a positive environment in the library at the same time he/she should understand the emotions, feelings of the staff and stand by their side to lend a helping hand.

Staff Training /Education and Promotional Practice :

The goal of staff training is to refresh the library staff members and educate them about the prevailing work practices in other College/Institutional libraries and also to develop a clear promotional policy to the library staff and thus enhance the performance level in the Library System. The library staff member should be taken for a visit to other College/ Institutional libraries to study their functioning, the purpose being to refresh them and also make them aware about the best practices followed elsewhere. A transparent promotion policy with requirements in terms of qualifications, length of service, expertise, regularity etc, should be followed. A clear job description and responsibility has to be ensured. The above factors inculcates positive thinking.

3. **Directing and Coordinating Corresponds to Blue Hat**

Blue Hat: It is a control hat. The Blue Hat thinker organizes the thinking itself. It deals with Direction, Coordination Decision, Discipline, Focus and Thinking tasks that are to be carried throughout the day.

A Library Manager with a Blue Hat has to control and regulate all the activities conducted in the library. She/he should have an eagle eye on the activities leading towards the achievement of the goal. As a organizer, she should have and promote good communication and coordination among the staff and maintain discipline in around library
Directing : is the part of management process which activates the staff to work efficiently and effectively to attain the objectives of the library. We cannot achieve tangible results in the library until we implement the proposed course of action. Directing is telling staff members what to do and seeing that they do it the best of their ability. e.g. Job Description.

4. Coordinating :

Coordination in an library is balancing and keeping together all the staff by ensuring suitable allocation of task to the various staff members and seeing that the tasks are performed with one harmony among all members. e.g. Monthly Library Time Table.

GNIMS Library provides 12 hours services to their valuable Users for all the seven days of the week. If any staff Member is on leave, then other staff members do the work, so that the Users don't suffer and they are given efficient and Prompt service.

5. Reporting and White Hat:

Reporting is the way to keep the higher authorities and the concerned Users informed about the performance of the staff and achievements of the library. Usually reporting is done by preparing the annual reports of the library and the Monthly Newsletter.

Library Manager with a White Hat: As White Hat deals with information, the Library Manager must have the all the Current Information. For e.g. He / She should be aware about the Workshops and Conferences, New Books, Magazines, Book Exhibition or any other relevant resources at the same time she should also report the above to the higher Authorities.

She/he should not only appreciate good work done by any staff member or department but also report to the higher authorities for the same.

6. Budgeting by wearing Green and Black Hat:

Budgeting - It is most common function of managerial library, where the annual Budget for the library is prepared to be sanctioned by the authority. Budget is fundamental to all the library, which generally received the attention and support of top management.

At the time of preparing the budget it should be kept in mind that the budget should be prepared flexible so that it can be adapted to change circumstances of future and can be revised when the plan is modified.

Library Manager with a Black Hat thinks of cost cutting, how to get more work with less investment. How to save the resources if there is a fire in the library? How can the resources be protected from termites and viruses? Black Hat usually deals with logical negativity. On the contrary, Library Manager with a Green Hat thinks of new ideas so that she / he can raise funds for the library . For e.g. By organizing Conferences / Workshops, Book Exhibitions, arranging for Guest Lectures, etc.

Conclusion :

The days are gone when the role of Libraries was issuing and returning of books. Today, Libraries are playing a multi dimensional role. Like a Manager of an Organization, the Library Manager have to plan, organize, train staff, direct, co-ordinate and with a less budget give maximum output to the Users.

GNIMS Library have been updating their staff skills with new technological advancements in the field and new innovations are being undertaken like Mobile App which give our Users instant information about the new arrivals, any new programs being conducted, Book Exhibition, Newsletter, etc. GNIMS Library prepares the annual budget, which comprises of the Books and Periodicals, Furniture and other miscellaneous expenditure.

Design Thinking involves constructive Creativity. This means putting ideas together and delivering value. Library Manager has a very vital role in keeping his / her team together and have more creative ideas to fulfil the library objectives as well as the fulfil the requirements of the Users. The major role of the Manager is Preparation and Action. Keeping all this mind, GNIMS Library is providing all the services to satisfy User's requirements. GNIMS Library is preparing for the future transformation in ICT (Information Communication Technology) and AI (Artificial Intelligence).

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Impact of Social Networking on College Library

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ABSTRACT :

The arrival of the social media has extremely changed the reading habits of most people especially the students. It seems they have totally preoccupied attention from the reading of books or fiction and visit to library for study, and have depended highly on social media as the main means of communication among themselves. The study investigates the use of social media by students and its impact on college library visit. Questionnaire was administered on a sample of the students to gather data and information.

Keywords : Social Networking, Networking Site, Preferred Social Networking Sites.

Introduction :

Social media, basically defined as grouping of internet based an application that builds on the ideological and scientific foundations for transforming communication, in to an effective and interactive conversation between different societies and individuals. Social media is one of the easiest means and includes media and social networking sites like face book, twitter, Google+ etc. This is creating lot of boom in the current generation as it is one of the exceptional resources in conveying the information. Using social media will help in improving contacts and thus increases business. Social media may comprise of different forms like magazines, social club, Internet forums, weblogs, social blogs, micro blogging, wikis, podcasts, photographs or pictures, video, rating and social bookmarking. Social media can be categorized in to six types and they are: Joint projects like Wikipedia, blogs like Twitter, content communities like YouTube, social networking sites like Face book, effective game worlds like World of War craft and virtual social worlds like second life. Other than this social media technologies may include: blogs, picture-sharing, blogs, wall-postings, email, instant messaging, music-sharing, crowd sourcing and voice over IP and many more. Social networking sites have both negative and positive impact on the education of the youth. **Kaplan and Halein (2010)** defined “social media as a group of internet based application that build on the ideological and technological foundation of web 2.0, and that allow the creation and exchange of user generated content. Social networking site allow users to share activities, event, ideas and interest within their individual network”.

Wang, Chen & Liang (2011) findings on effect of social media on college students, showed that social media use is negatively associated with academic performance. They also reported that about two-thirds of the students are found using social media while in class studying or doing home work. This multitasking increases distraction and becomes detrimental to student performance. Also according to **Kalpidon, Castia and Morris (2011)** “as social media websites, such as Facebook, YouTube and twitter gain popularity, they are also becoming increasingly dangerous as they create modes to students to procrastinate while trying to complete homework and assignment”. In their survey of 102 students, 57% stated that social media has made them less productive. **Shehu, Nansoh and Shehu, Allahde (2014)** they identified that that most of the students in Ahmadu Bello University have taken advantage of social networking sites to enhance their social relationship with friends, relations and others. They also use the social media to share and exchange academic

information. Though they enjoy these benefits from social network, some of the students reported that the social media has resulted in distraction in classroom and reading habit because of reduction in time spent reading.

So many eminent scientist studies on impact of social media on youth also its positive and negative effect on society some of these studies are reviewed during the research.

The arrival of the social media has extremely changed the reading habits of most people especially the students. It seems they have totally preoccupied attention from the reading of books or fiction, visit to library for study and have depended highly on social media as the main means of communication among themselves. This phenomenon is observed in most college libraries and it appears to affect student's performance. Today, students mostly do not read novels or fiction to gain knowledge in order to improve their performance. It is expected that a study of this kind would help all library professional in the educational institutions to establish the link between the use of social media sites and their effect on the reading habits of students.

Objectives :

1. To study the awareness level of usage of different social networking sites by students.
2. To investigate the effect of social media on the use of college library by undergraduate students.
3. To investigate the reason for using social networking sites

Scope of the Study: Research was conducted on the students of Rural region Dhamangaon (Rly). Dist. Amravati. Total sample size taken is 300 students from Art faculty.

Methodology: The data was collected with the help of questionnaire and whenever needed literature search was also done. Collected data were analyzed and result was displayed in the form of tables and Graphs.

Analysis and Interpretation : The questionnaires were distributed amongst 300 students out of this 250 questionnaire received from respondents. In response to the query whether they have the access to the internet or not is shown in Table 1.

Table 1. Access to Use Internet or Not

S. N.	Access to	Responses	Percentage	Use internet
1	Use	215	86	
2	Don't Use	35	14	
	Total		250	100

It is observed from Table 1 that the ratios of users with the average of using social network 215(86%) is high as compared not using social networks (35%).

The Table 2 shows the number of social networking sites users

Table 2: Preferred Social Network Site by Respondents.

S. N.	Name of the Social Networkin Sites	Frequency	Percentage
1	WhatsApp	115	53.48
2	Facebook	35	16.27
3	Twitter	28	13.02

4	YouTube	18	8.37
5	LinkedIn	10	4.65
6	Blogs	9	4.18
	Total	215	100

From Table 2, it indicated that most of the respondents preferred WhatsApp, they constitutes 115 (53.48%) respondents, follow by Facebook and twitter with 35 (16.27%) and 28 (13.02%) respondents respectively. Others social media sites are also in use but the above stated three social network sites receive higher popularity among students. WhatsApp and Facebook are the most popular website of all the other social networking sites.

Table 3: Reasons for Using Social Network Site

Reasons	Frequency	Percentage
For Reading/Academic Purpose		
Reading of newspapers/magazines	9	4.18
To share and exchange academic information source materials to read for exam and Test	35	16.27
Latest world/surrounding information	28	13.02
To communicate with lecturer	15	6.97
For Non Academic Purpose		
Chatting with friends	55	25.58
Photo sharing	38	17.67
To create/post photo	20	9.30
To create groups of likeminded individual	15	6.97
Total	215	100

The data in table 3 shows that students use social network for various reasons. The table indicated that majority of them uses social network for non academic purposes than for academic purposes. This indication is well expressed when the highest number of 55 (25.68%) respondents were indicated their reasons to be for chatting with friends, others 38 (17.67%) respondents were stated photo sharing and 15 (6.97%) respondents creating groups of likeminded individuals respectively. While 35 (16.27%) respondents were use social media for academic purpose.

Table 4: The Extent at which Students Rely on Social Network for Academic Purpose

S. N.	Students Rely on Social Network	Frequency	Percentage
1	To a great extent	139	69.5
2	To some extent	65	30.23
3	Not at all	11	5.5
	Total	215	100

Table 4 revealed that majority of the students rely on social network for their academic purpose, they constitute 139 (69.5%) respondents, and other 65 (30.23%) respondents indicated that they rely on it to some extent. While, 11 (5.5%) respondents indicated they do not rely on it. This shows that most of the students rely on social network for their academic purpose.

From table 5 above, it is clear that social networking site has an effect on the library visit by students. The first indication is that they get distracted when friends communicate with them while they are reading in the Library. These constitute 72 (36%) respondents who are the highest number that strongly agree to this. It is also clear that because they want to make friends, their social contact increases daily, they constitute the highest number of 135(62.79%) respondents that agree. Others 88 (40.90%) strongly agreed that social network site reduce time for reading.

Also 79 (36.74%) respondents agree that no time limitations for searching information as compare to library From this table it can be easily deduced that these are all factors that pose challenges to reading habit of students.

Table 5: Effect of Social Network site on Library Visit

S. N.	Effect of social networking site	Agree	Strongly Agree	Disagree	Strongly Disagree	Undecided
1	Distract while reading in library	82(38.13%)	72(36%)	40(20%)	8(4%)	13(6.5%)
2	Increase socialization contact with friends	135(62.79%)	65(30.23%)	5(2.32%)	-	10(4.6%)
3	Reduce time for reading and searching information as compare to library	78(36.27%)	88(40.90%)	23(10.69%)	11(5.11%)	15(6.97%)
4	No Time limitations	79(36.74%)	67(31.16%)	36(16.74%)	10(4.65%)	23(10.69%)

Conclusion: It is clear that most of the students in Dhamangaon (Rly) Taluka have taken advantage of social networking sites to enhance their social relationship with friends, relations and others. They also use the social medium to share and exchange academic information. Though they enjoy these benefits from social network, some of the students reported that the social media has resulted in distraction in library and reading habit because of

reduction in time spent reading.

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ABSTRACT :

Number of changes is happening in the Indian economy. Various reforms have been taking place across different sectors in the Indian economy. Education sector is no way an exception to it. For the last few months education system is witnessing some key changes reflecting a moving away from traditional learning system. For example, UGC recently came out with a policy of making NET exam clearance as basic criteria for Ph.D. admission level three institutions across India. Similarly at the state level, school education system is witnessing various changes. At global level, artificial intelligence is gaining importance. The changing nature in the perceptions of students and increasing competitiveness demands technical driven education. Artificial Intelligence is expected to improve the grading system, teaching methods and learning methods. This paper seeks to study the students perception about whether if AI is implemented, can be successful in transforming the way of learning through primary data. The study arrives at a meaningful conclusion and provides scope for further research in this area.

Keywords : Changing Economy, Changing Educational Policies, Increasing Competitiveness, Technology Driven Education, Role of Artificial Intelligence.

Introduction :

Artificial intelligence is a science and technology based on disciplines such as Computer Science, Biology, Psychology, Linguistics, Mathematics, and Engineering. A major thrust of AI is in the development of computer functions associated with human intelligence, such as reasoning, learning, and problem solving. Indian education system has witnessed a significant change in the past few years. Technology will play a big role in improving the learning conditions and can develop better understanding of subjects among students. Libraries play an important role in increasing the knowledge among students. They still serve to be major source of information in many places. Digitalizing the education system and libraries bring out can bring out various advantages to both students and faculties. Some of the important applications of AI are discussed below

Natural Language Processing: It is possible to interact with the computer that understands natural language spoken by humans.

Expert Systems: There are some applications which integrate machine, software, and special information to impart reasoning and advising. They provide explanation and advice to the users.

Vision Systems: These systems understand, interpret, and comprehend visual input on the computer.

Speech Recognition: Some intelligent systems are capable of hearing and comprehending the language in terms of sentences and their meanings while a human talks to it. It can handle different accents, slang words, noise in the background, change in human's noise due to cold, etc.

Handwriting Recognition : The handwriting recognition software reads the text written on paper by a pen or on screen by a stylus. It can recognize the shapes of the letters and convert it into editable text.

Statement of the Problem :

Education system in our country requires revision. Technology is found everywhere in our life. It affects the way we live and work and several other aspects. Technology can bring out a significant change in education system. They can change the learning conditions, the way of understanding of students, easy accessible of information in libraries, maintenance of large data of books available in libraries, accurate location of book available and so on. Artificial Intelligence is presently growing idea considered in different industries across the world. AI like speech recognition, handwriting recognition can reduce the burden of students and teachers. Implementing such technology requires many considerations. This study seeks to identify students' opinion about artificial intelligence in education system.

Rationale of the Study :

Several research studies focused on importance of technology in education system. Very few research studies and articles discussed the importance of Artificial Intelligence in libraries and education system. This study is also unique as it seeks to study the student's opinion about the benefits of Artificial intelligence in libraries and education system in general.

Scope of the Study :

The Study titled "Artificial Intelligence – A Revolutionary way to strengthen Indian Education system" is limited to the respondents in Chennai city. The study is also limited to the responses of students in Chennai city.

Objectives of the Study :

The objectives of the study are as follows

- To understand different forms of artificial intelligence
- To identify the benefits of artificial intelligence in education system.
- To offer suggestions on implementation of AI in education system.

Research Methodology :

The data required for this study is collected from both primary and secondary sources.

Primary Data :

The primary data for the study is collected through the structured questionnaire with close ended questions.

Secondary Data :

The secondary data for the study is collected from various sources like journals, magazines and websites.

Sampling Design :

The sample size consists of 50 respondents from Chennai city. Simple random sampling technique is used for the study. A simple random sample is a subset of a statistical population in which each member of the subset has an equal probability of being chosen.

Statistical Design :

The statistical design used in this study is factor analysis with Varimax rotation. Factor analysis is a technique that is used to reduce a large number of variables into fewer numbers of factors. This technique extracts maximum common variance from all variables and puts them into a common score. As an index of all variables, one can use this score for further analysis.

Limitations of the Study :

The various limitations of the study are as follows

- The study uses the data collected from both primary and secondary data. Therefore limitations of these sources apply to this study.
- The study deals with the data made available and therefore it may not judge the entire scenario.
- The study is mainly focused on youngsters in Chennai city and therefore results can vary when the same study is conducted in any other geographical locations.

Data Analysis and Interpretation :

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.842
Bartlett's Test of Sphericity	Approx. Chi-Square	538.626
	Df	91
	Sig.	.000

	Communalities	
	Initial	Extraction
Personalized Education with AI	1.000	.794
AI can be used to grade students	1.000	.663
Provides Customized Knowledge to learners	1.000	.803
Better understanding among students	1.000	.736
Facilitates creativity, engagement and strong learning outcomes	1.000	.837
Provides tutors with real time feedback	1.000	.816
It helps tutors to identify skill gap among students	1.000	.802
Develops high potential prospective teachers	1.000	.670
It helps teachers to develop non-cognitive skills among students	1.000	.743
AI provides libraries with opportunity to change informational infrastructure	1.000	.801
AI facilitates easy accessibility of information to students from libraries	1.000	.578
AI can increase new library services	1.000	.814
It can develop new capabilities and increase efficiency of libraries	1.000	.693
Improved image recognition and data analysis in libraries	1.000	.819
Extraction Method: Principal Component Analysis.		

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.871	49.079	49.079	6.871	49.079	49.079	4.267	30.479	30.479
2	2.474	17.669	66.748	2.474	17.669	66.748	3.342	23.869	54.348
3	1.224	8.746	75.493	1.224	8.746	75.493	2.960	21.146	75.493

	Rotated Component Matrix ^a		
	Component		
	1	2	3
It helps teachers to develop non-cognitive skills among students	.857		
AI provides libraries with opportunity to change informational infrastructure	.842		
Personalized Education with AI	.835		
Develops high potential prospective teachers	.816		
Provides Customized Knowledge to learners	.795		
AI can be used to grade students	.736		
Facilitates creativity, engagement and strong learning outcomes		.877	
Provides tutors with real time feedback		.852	
Better understanding among students		.814	
It helps tutors to identify skill gap among students		.803	
AI can increase new library services			.856
Improved image recognition and data analysis in libraries			.817
It can develop new capabilities and increase efficiency of libraries			.773
AI facilitates easy accessibility of information to students from libraries			.651
Extraction Method: Principal Component Analysis.			
Rotation Method: Varimax with Kaiser Normalization.			
a. Rotation converged in 5 iterations.			

Interpretation :

Factor I: Learner Benefits

The first set of factor loadings can be grouped under the name Learner benefits. Artificial Intelligence will help the teachers in developing non-cognitive skills among students. These skills help the students achieve perseverance, motivation and self control in schools. Artificial Intelligence technologies can really motivate students to learn rather than what traditional teaching aids do.

Artificial Intelligence can also provide libraries with opportunities to change informational infrastructure. This is because artificial intelligence can help the libraries to store data, books, journals etc electronically rather than physical storage making it difficult for the learners to get the source of information they need. Further they will also help the students and researcher timings in search for information.

Artificial Intelligence can result in personalized learning. The traditional way of learning promotes group learning where teacher gives instruction, notes etc which is noted down by the students. This can result in unbalanced involvement in class by students and also inappropriate learning. But when artificial intelligence devices are available, they can result in personalized education among students.

Artificial Intelligence can develop prospective teachers. No doubt, teachers need to equip themselves according to the needs of the students and changes happening in the teaching environment. Thus artificial intelligence can result in developing prospective teachers who are technologically sound and transfer the same to the learners.

Artificial intelligence can provide customized knowledge to learners. They will help the learners to understand the various aspects of artificial intelligence and its role in the education and others fields of knowledge.

Finally, artificial intelligence can be used to grade students. They can serve as better grading guides. It makes evaluation more comprehensive and meaningful.

Factor II: Tutor benefits

Artificial Intelligence can facilitate creativity, engagement and strong learning outcomes among students. This helps the tutor to achieve the fundamental goals of teaching. When technology is used as teaching aid, they can stimulate creativity among students by way of out of box thinking which will result in good learning outcomes among students.

Artificial Intelligence can be used to provide with real time feedback for teachers. Constant surveys can be conducted and regulatory bodies of education can also evaluate teacher's performance periodically which will help them in understanding their weaknesses and take steps to overcome those weaknesses.

Artificial Intelligence can result in better understanding among students. Because it helps the students to get involved in classroom sessions, it reduces much of the burden of the teacher and also results in better understanding of what they are learning.

Finally, it also helps teachers to identify the skill gap among students. This will help the teachers and institutions in framing their curriculum and other activities in such a way they develop those skills that are essential for survival in today's world.

Factor III: Library benefits.

Artificial Intelligence increases new library services. Technologies results in bringing new services in libraries like data analysis, data recognition, acquiring sources of digital information that can better facilitate researcher. It will also result in reducing much of the time spent by the researchers in locating the source of information. Further it will also help the libraries to get various sources of information in a speedy way than they are physically brought from different locations.

Artificial Intelligence can increase image recognition and data analysis in libraries. For example, libraries can use coding or speech recognition to record the materials issued for references and also for renewal of these references by the learners. Further it will also help the libraries to keep track of information like number of books, journals, newspapers, magazines etc available in the libraries, number of informational sources issued to students, professors and researches, issues to be brought from outside etc.

Artificial Intelligence can develop new capabilities and increase efficiencies of libraries. This is because it provides many advantages like electronic storing of data, data related to books issued and available etc. This will increase the efficiencies of libraries and helps to perform better.

Finally, artificial intelligence can help the students to access to many information that are otherwise not available to them. This is one of the benefits of libraries, especially for researchers. This is because libraries can provide them with information that are of high cost to the researchers at low cost or even cost free which will facilitate research activities. Further it will also attract more number of students to libraries because of convenience and accurate information that can be provided by the libraries through artificial intelligence.

Statistical Inferences :

Statistically, the factor analysis has been used to group the factors to understand the benefits of Artificial intelligence.

KMO and Bartlett's test: This test measures the sampling adequacy of the study. So, the sampling adequacy of the study according to this measure is 0.842. A measure of above 0.5 is preferable. Therefore, this measure tells us that the measure is highly reliable.

Total variance explained: The total variance explained indicates the information regarding the dimension of factor reduction. It reveals a value of 75.493%. Anything above 60% is considered good. Thus the study satisfies this condition also.

Rotated Component Matrix: This table shows grouping of factors. Based on Eigen values and above 0.5 the variables are grouped into three factors based on which they are interpreted in the study.

Findings :

The findings of the study are as follows

- There are three set of benefits because of artificial intelligence namely learner, tutor and library benefits.
- The major benefits of artificial intelligence would be facilitating strong learning outcomes, development of non-cognitive skills and new services in libraries.
- AI can increase efficiencies of libraries because of easy handling and accessibility to large data and information.
- It makes available information faster for researchers.
- It reduces much of the time spent by the researchers in locating the source of information in libraries.

Conclusion :

To conclude, artificial intelligence, if implemented can really benefits various categories of people in the Indian education system apart from those discussed in the study. Further, they can result in interactive class sessions with active participation of students and can result in personalized education. The benefits discussed are not exhaustive but gives an idea about how artificial intelligence can strengthen Indian education system.

Suggestions :

This study suggests implementing the basic artificial intelligence technologies to further strengthen the Indian education system. Advanced level of artificial intelligence is robotics which should be avoided as it threatens the jobs of many librarians across the country. Sufficient cost-benefit analysis can be conducted and AI technologies can be implemented in a phased manner.

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-

Use Pattern among Researchers in Geography : A Citation Analysis Study

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ABSTRACT :

Research has become an important aspect of human activity. It provides dependable solution to problems, which manifest in various fields of study. It is through research that knowledge grows and develops, ultimately leading to the extension of the boundaries of knowledge and scholarship. Research also enables man to find solution to his problems and resolve conflicts. This shows the importance of research. Doctoral research is also conducted by various researchers to solve the problems in their field. This study has its aim to compile Ph.D. thesis in the subject of Geography submitted to Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

Keywords : Citations, Geography, Research, Doctoral Thesis

Introduction :

Measurement of research in Geography is based on awarded research. Present study also considers only awarded research in Geography. Research productivity will be analysis based on various field. These fields are research problem, methodology, limitations, procedures for data collection and data analysis etc. in the form of bibliography. Bibliography will also produce guide, researcher, title and subject index. Study will also cover abstracting of the thesis.

Collected information will be arranged methodologically into set of entries. This research will increase productivity of awarded research in Dr. Babasaheb Ambedkar Marathwada University, Aurangabad by the compilation of all related information.

Statement of Research Title : The present study entitled, “Use pattern among Researchers in Geography: a citation analysis study”.

Definitional Analysis : The operational definitions of some of the frequently used terms in the present study as under.

Use Pattern: Use pattern means the style of using. The style may be different for different person the use pattern includes concepts like style at searching for information sources of Searching information, preference of materials, interaction with the information system.

Researcher: Dictionary meaning of Research is studious in inquiry in a field or into a specific subject while researcher means a person who researchers someone studying or investigating a subject.

Geography: “The Science of space and place that brings together earth’s physical and human dimension in the integrated study of people places and environments.

Need of the study :

The individuals and organizations are spending amount of money, time and resources on research and development. The research organizations largely determine its development, influence and creation with distribution or utilization of it.

Geography literature in Marathi and English at the National international level has been covered by indexes, abstracts, and bibliographical, both current and retrospective. But country wise or regional level library science literature bibliography is not found easily. This study will be undertaken towards this point of views.

This study attempts at bibliographical control of Ph.D. thesis submitted and awarded by Dr. Babasaheb Ambedkar Marathwada University, Aurangabad up to 2010. The listing would help to analyze the data and enrich the contribution, trend and growth of research in the field of Geography.

Objectives of the study :

The main objective of the present study is to examine the literature use pattern of information sources by Geography researchers. This is sought to be done by nature of citation pattern of literature to:

- To determine the number of citation per thesis in particular subject.
- To find out the forms of documents used their language and countries of origin.
- To observe authorship pattern.
- To compile a rank list of authors, books and journals.
- To observe chronological distribution of books and journals.

Hypothesis of the study :

The following Hypothesis are framed.

1. Books are the most common cited sources in the field of Geography.
2. Geography researchers preferred Indian publication rather than foreign publication.
3. Mostly English language is preferred.

Scope and limitations of the Study :

The scope of the present study is limited to Ph.D. thesis till 2010 in the subject of Geography awarded by Dr. Babasaheb Ambedkar Marathwada University, Aurangabad. Total 23 total number of thesis were submitted in period of 2000 to 2010.

Population of Sample :

The study of population consist of 23 total number of thesis are submitted to Babasaheb Ambedkar Marathwada University, Aurangabad. In period of (2000 to 2010)

Research Methodology :

The present study is based on the citation of dissertation by Geography researcher at Babasaheb Ambedkar Marathwada University, Aurangabad.

Data Collection Method :

The literature cited in the Ph.D. thesis in Geography will be the basic source of information use by the researchers. Accordingly, the bibliographical references cited at the end of the Ph.D. thesis will be taken as the sources data for the present study. The Ph.D. thesis submitted to Dr. Babasaheb Ambedkar Marathwada University Aurangabad in the subject

History will be studied.

The present investigation is concerned with the sources referred. To in Ph.D. Thesis submitted to Dr. Babasaheb Ambedkar Marathwada University Aurangabad in the subject Geography of each thesis will be collected by means of a work sheet design for the purpose.

Data Analysis :

The major conclusion of this study is to collect the data from 23 Thesis. In all thesis 2130 citation where found. All card arranged according to requirement of the study e.g. type of document included books, report, journal, Biography, Dictionary, Encyclopedia, periodical, article etc. for the analysis analyzed according to country for the analysis the data for geographical distribution data analyzed according to country for chronological distribution data analyzed according to year of publication of document for ranking of author and journals data analyzed according number of citation.

Wherever necessary the data was analyzed and represented in the form table, a graphs, bar, charts, and pie-charts to pie chart show the result.

Average Citation per thesis :

During the period 2000 to 2010 the total 23 number of thesis were submitted to Dr. Babasaheb Ambedkar Marathwada University in the subject Geography. It has been described variously as significance impact utility and effectiveness, but no one has succeeded in defining it in more tangible terms. The following table shows average citation per thesis.

Table No. 1 Average of Per Thesis

Sr. No	Thesis No	Books Journals	Gazetteer	News Paper	Report	Thesis	Dictionary	Total
1	1	49	27	1		22	1	100
2	2	43	41	1		9	6	100
3	3	27	24		6	11		68
4	4	80	69	1		42	2	194
5	5	60	27	2		23	2	114
6	6	42	10	1	15	5	3	76
7	7	15	9			28	1	53
8	8	8	35			38	1	82
9	9	46	29			19		94
10	10	52	62			5		119
11	11	46	40			17	5	108
12	12	24	22			1		47
13	13	40	30			24	5	99
14	14	2	34	2		4	5	47
15	15	33	21			20	6	80
16	16	22	35			18	4	79
17	17	47	21	3		11	3	85
18	18	25	31			7	1	64
19	19	82	10	1		41	2	136
20	20	49	29			17	5	100

21	21	51	33			11	1	96
22	22	61	2			26	1	90
23	23	55	33	2		7	2	99
	Total	959	674	13	7	416	58	32130

Subject wise Distribution of Citation :

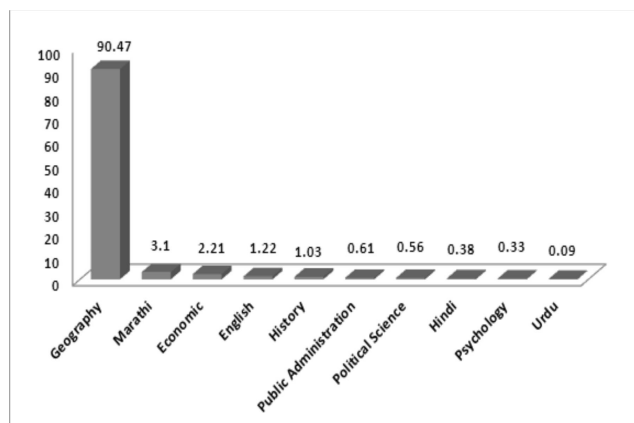
The subject wise distribution of citation is presented in the Table No. 2. While analyzing the data it is found that 90.47% of citations were from the fields of Geography the citation is also found in other subject like Political Science, Public Administration, Economics, History, etc. The research scholars Referred to other research literature which is related to

Table No. 2 Subject Wise Distribution :

Sr. No	Subject	No. of Citations	Percentage (%)
1	Geography	1927	90.47
2	Marathi	66	3.10
3	Economic	47	2.21
4	English	26	1.22
5	History	22	1.03
6	Public Administration	13	0.61
7	Political Science	12	0.56
8	Hindi	8	0.38
9	Psychology	7	0.33
10	Urdu	2	0.09
	Total	2130	100

Figure No. 1 Subject wise Distribution :

Their topic, the Table 2 and figure 1 clearly shows how the other subjects are influenced in their topics. Political Science (0.56%), English (1.22%) Economics (2.21%) and public Administration, (0.61%), and so on it's clearly shows that the discipline Geography interacts with no. of Branches social science and humanities.



Form wise Distribution :

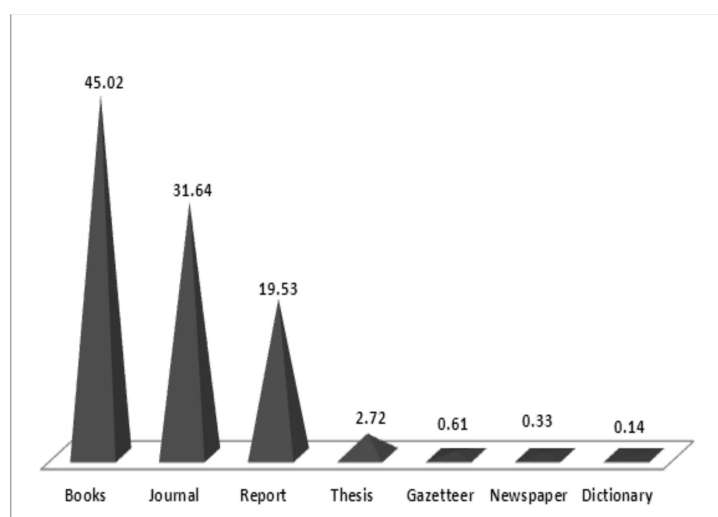
An attempt made to examine the physical forms of documents, the importance of various forms of publication lies in its representation of a information need to find out type of documents used all the citation may be classified different categories of documents.

Table No. 3 Form wise Distribution :

Sr. No	Types of Document	No. of Citations	Percentage (%)
1	Books	959	45.02
2	Journal	674	31.64
3	Report	416	19.53
4	Thesis	58	2.72
5	Gazetteer	13	0.61
6	Newspaper	7	0.33
7	Dictionary	3	0.14
	Total	2130	100

Figure No. 2 Form wise Distribution

From the table no. 3 and figure 2 it is evident that out of the total 2130 citations 959 (45.02%), are the books citation on



the other Journal were accounted for only 674 (31.64%), of total citations. This indicate that the hypothesis **“Books are the most common cited source in the field of Geography”** (Hypothesis No.1) is valid.

Authorship Pattern

To conduct Authorship analysis, the authors of publications are the main element of the study law the researcher after completion of a project or on completion an area of study. State of the result in the research papers or publish them in the form of articles in the different Journal and book. The data further sub grouped as single author, double author

and three authors.

Table No. 4

Authorship Pattern

Sr. No	No. of Author	No. of Citations	Percentage (%)
1	Single Author	1629	84.49
2	Two Author	271	14.06
3	More than Two Author	28	1.45
4	No Author	202	9.48
	Total	2130	100.00

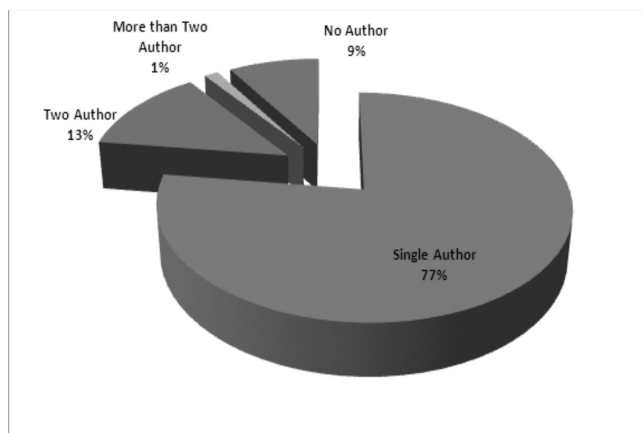
Figure No. 3 Authorship Pattern

Table no. 4 and figure no. 3 represent that (84.49%) cited document are by single Authors which is followed by double Authors contribution (14.06%), third Author contribution (1.45%), which indicates that Author in Geography prefer to publish their work individually.

Ranking of Authors Cited :

Efforts were made to analyze the data no rank authors cited. It's helpful to know who has been a famous author among library profession. After analyzing 2130 citation from 23 Ph.D. Thesis of Geography found that very few authors were cited many times.

Table No. 5

Ranking of Authors Cited :

Sr. No	Name of Author	No. of Citations	Percentage (%)
1	Singh, Jasbir	56	2.63
2	Dhillon. S. S	38	1.78
3	Shinde, S. D	25	1.17
4	Singh, R. L	22	1.03
5	Mandal. R. B	17	0.80
6	More, K.S	11	0.52
7	Author received sixteen Citations	32	1.50
8	Author received fifteen Citations	45	2.11
9	Author received fourteen Citations	70	3.29
10	Author received thirteen Citations	39	1.83
11	Author received twelve Citations	72	3.38
12	Author received nine Citations	81	3.80
13	Author received eight Citations	124	5.82
14	Author received seven Citations	42	1.97
15	Author received six Citations	174	8.17
16	Author received five Citations	165	7.75
17	Author received four Citations	228	10.70
18	Author received three Citations	74	3.47
19	Author received two Citations	156	7.32
20	Author received one Citations	457	21.46
21	No Author	202	9.48
	Total	2130	100

It was interesting to know from table no. 5 which publication have been cited repeatedly and of which others the list of authors of documents is preferred it was observed from the Table No. 3.5 that three authors i.e. Singh Jasbir 56 (2.63%), Dhillion S. S 38. (1.78%) and Shinde S. D. 25. (1.17%) where the popular author among the researchers.

Ranked List of Book Titles

Table No. 6 Ranking List of Book Titles

Sr. No	Titles of Books	No. of Citations	Percentage (%)
1	Agricultural Geography Tata	29	3.02
2	Agricultural Geography	29	3.02
3	Indian Economy	20	2.09
4	Author received eleven Citations	22	2.29
5	Author received nine Citations	27	2.82
6	Author received eight Citations	24	2.50
7	Author received seven Citations	56	5.84
8	Author received six Citations	12	1.25
9	Author received five Citations	60	6.26
10	Author received four Citations	44	4.59
11	Books received three Citation	51	5.32
12	Books received two Citation	374	39.00
13	Books received one Citation	67	6.99
14	Not available	144	15.02
	Total	959	100

The above list rank of titles of the Books was preferred according to descending order of the citations in table no. 6 from the list it appears that *Agricultural Geography Tata 29 (3.02%)*, *Agricultural Geography 29 (3.02%)* and *Indian Economy 20 (2.09%)* the three popular titles of books preferred the researchers.

Geographical Distribution of Books (State wise) :

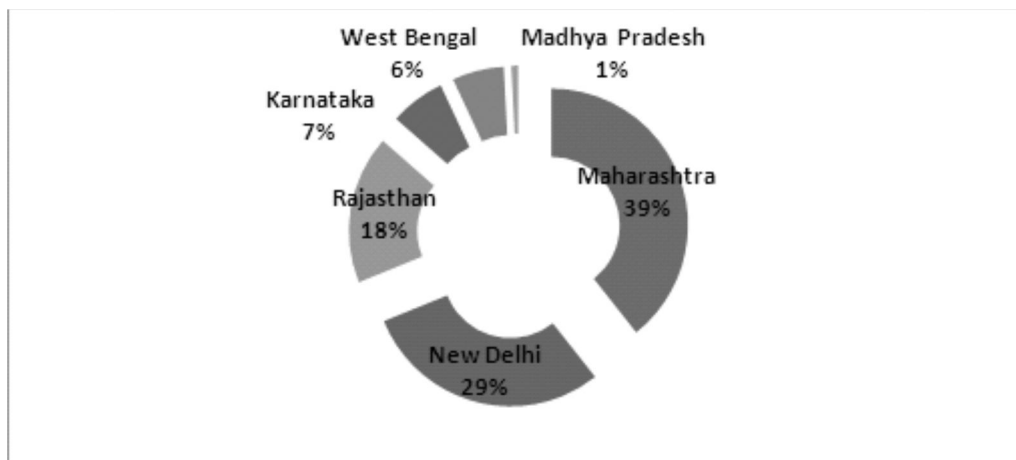
The table no.7 show geographical distribution of Books cited by Geography.

Table No. 7

Geographical Distribution of Books (State wise)

Sr. No	Name of State	No. of Citations	Percentage (%)
1	Maharashtra	192	39.34
2	New Delhi	144	29.51
3	Rajasthan	86	17.62
4	Karnataka	32	6.56
5	West Bengal	30	6.15
6	Madhya Pradesh	4	0.82
	Total	488	100.00

Figure No.4 Geographical Distribution of Books (State wise) :



Books of Geography were analyzed by the State which published the book table no. 7 and figure no. 4. Present and the prevailing trends show that New Delhi, Rajasthan, West Bengal Madhya Pradesh, Karnataka these five State produce 58.19% of the total Books and Maharashtra produces 39.34% out of Total.

Geographical Distribution of Journals (State wise) :

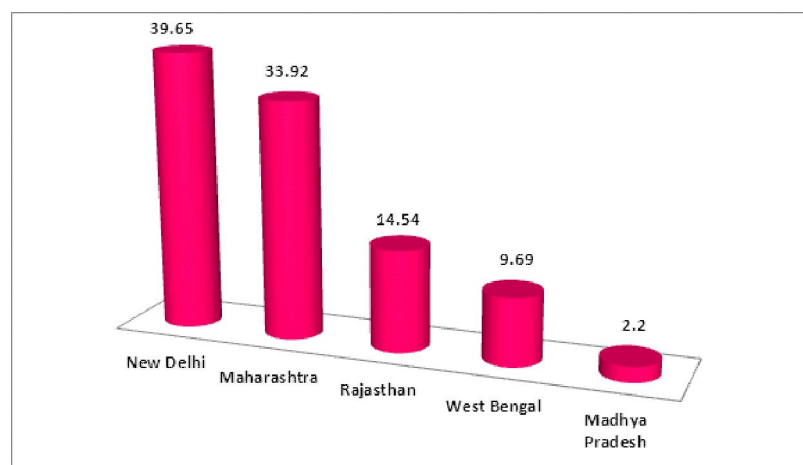
The table No. 8 and figure no. 5 shows Geographical Distribution of Journals cited by Geography.

Table No. 8

Geographical Distributions of Journals (state wise) :

Sr. No	Name of State	No. of Citations	Percentage (%)
1	New Delhi	90	39.65
2	Maharashtra	77	33.92
3	Rajasthan	33	14.54
4	West Bengal	22	9.69
6	Madhya Pradesh	5	2.20
	Total	227	100.00

Figure No. 5 Geographical Distributions of Journals (state wise)



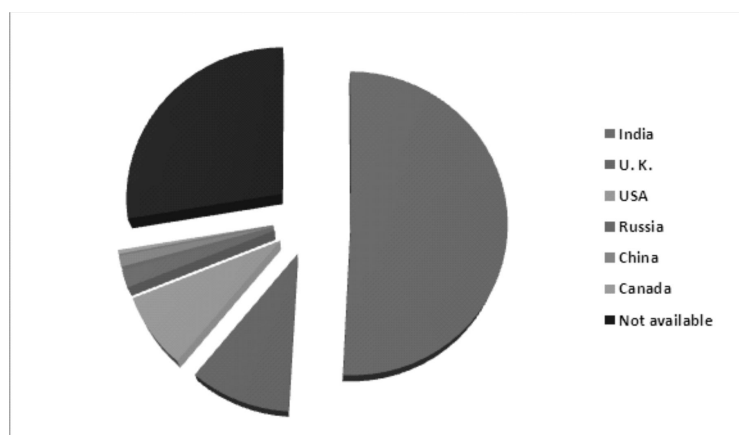
Journal of Geography were analyzed by the State countries which published the book table no. 8 and figure no. 5. present and the prevailing trends show that Maharashtra, Rajasthan, West Bengal, Madhya Pradesh, these four State produce 60.35% of the total Journal. And New Delhi produces 39.65% out of total.

Geographical Distribution of Book

Efforts are made to analyze the books cited according to country of publication because we must know the foreign or India documents

Table No. 9 Geographical Distribution of Books

Sr. No	Name of Country	No. of Citations	Percentage (%)
1	India	488	50.89
2	U. K.	97	10.11
3	USA	76	7.92
4	Russia	18	1.88
5	China	11	1.15
6	Canada	4	0.42
7	Not available	265	27.63
	Total	959	100

Figure No. 6 Geographical Distribution of Books

Books of Geography were analyzed by the countries which published the book table no.9 and figure no. 6. Present and the prevailing trends show that UK, USA, Russia. These three countries produce 19.91% of the total books and India produces 50.89% out of total. This indicated that the hypothesis **“Geography researchers preferred Indian publication rather than foreign publication” (Hypothesis No. 2)** is valid.

Geographical Distribution of Journals

Research is characterized by its Global approach.

It is interesting and important to have a spectrum of geographical distribution of cited Journals.

Table No. 10 Geographical Distribution of Journal

Sr. No	Name of Country	No. of Citations	Percentage (%)
1	India	227	33.68
2	Russia	7	1.04
3	Canada	6	0.89
4	China	3	0.45
5	U. K.	1	0.15
6	USA	1	0.15
7	Not available	429	63.65
	Total	674	100.00

Figure No. 7 Geographical Distribution of Journal

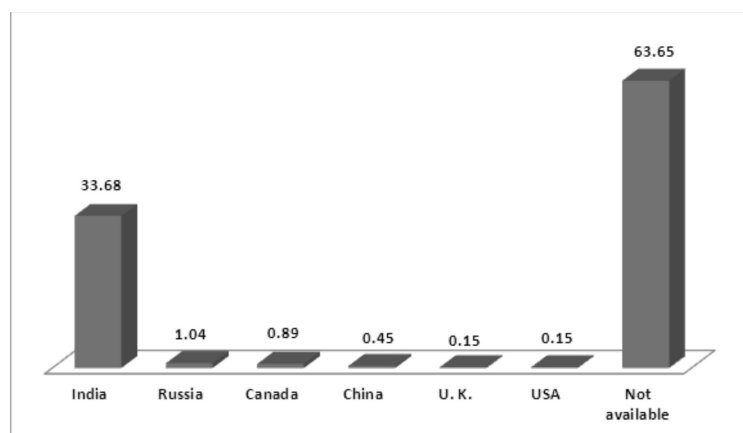


Table No. 10 and figure no. 7 gives the geographical distribution of Journals. **India** has the first rank with 227 citations forming (33.68%) of the total citation, second rank goes to **Russia** with 7 citations forming (1.04%) of the total citation third rank goes to **Canada** with 6 citations forming (0.89%) of the total citation. This indicated that the hypothesis “**Geography researchers preferred Indian publication rather than foreign publication**” (Hypothesis No. 2) is valid.

Ranking of Journal Title

The table No. 11 Show Geographical Distribution of Journals cited by Geography.

Table No. 11 Ranking of Journal Title

Sr. No	Title of Journal	No. of Citations	Percentage (%)
1	Geographical Review of India	90	13.35
2	National geographical journal of India	48	7.12
3	Institute of the Indian geographers	39	5.79
4	Journal received twenty-nine Citation	58	8.61
6	Journal received fourteen Citation	28	4.15
8	Geography Review	13	1.93
9	Journal received twelve Citation	36	5.34
12	The Geography	11	1.63
13	New Dimensions in Agriculture Geography	9	1.34
14	Journal received eight Citation	16	2.37
15	Journal received six Citation	30	4.45
16	Journal received five Citation	25	3.71
17	Journal received four Citation	12	1.78
18	Journal received three Citation	24	3.56
19	Journal received Two Citation	68	10.09
20	Journal received One Citation	20	2.97
21	Not available	147	21.81
	Total	674	100

The list of titles of the Journal name was preferred according to descending order of the citations in Table No. 3.11 from the list it appears that Geographical Review of India 90 (13.35%), National Geographical Journal of India 48 (7.12%), Institute of the Indian Geographers (39) 5.79%

Ranking of Publication Titles

Table No. 12 Ranking of Publication Titles

Sr. No	Titles of Publication	No. of Citations	Percentage (%)
1	McGraw Hill Publishing	72	3.38
2	Concept Publication Company	66	3.10
3	Prentice Hall Englewood Cliffs	42	1.97
4	Vishal Publication	35	1.64
5	Rawat Publication	33	1.55
6	Kalyani Publisher	29	1.36
7	Mac Millon Publication	27	1.27
8	Oxford & IBH Publication	20	0.94
9	TakshshilaPrakashan	18	0.85
10	S Chand and Company	16	0.75
11	Academic Publication	15	0.70
12	Joha Willey and Sons	14	0.66
13	Methuen and Corporation	13	0.61
14	Longman Group Publication	12	0.56
15	Aditya Publishers	11	0.52
16	Publication received nine Citation	18	0.85
17	Publication received eight Citation	24	1.13
18	Publication received seven Citation	14	0.66
19	Publication received six Citation	24	1.13
20	Publication received Five Citation	20	0.94
21	Publication received Four Citation	32	1.50
22	Publication received three Citation	42	1.97
23	Publication received two Citation	123	5.77
24	Publication received one Citation	312	14.65
25	Not available	1098	51.55
	Total	2130	100.00

Table no. 12 gives the Publication wise distribution. **McGraw Hall Publication** the first rank with 72 citations forming (3.28%) of the total citation, second rank goes to **Concept Publication** with 66 citations forming (3.10%) of the total citation.

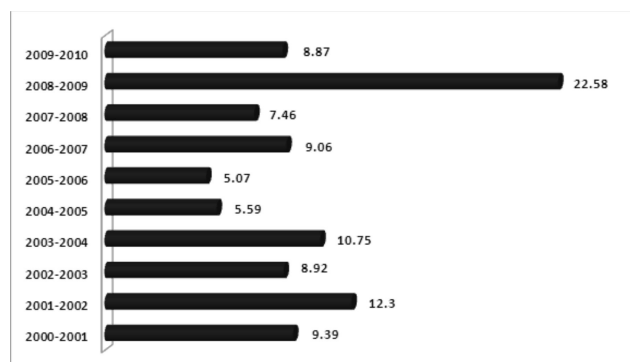
Chronological Distribution of Citation.

Chronological Distribution of total citation is necessary and relents to know the age to the cited references major information resources Book, Journals, Report, Thesis, News Paper, dictionary, Gazetteer etc.

Table No. 13 Chronological Distribution of Citation

Sr. No	Year	No. of Citations	Percentage (%)
1	2000-2001	200	9.39
2	2001-2002	262	12.30
3	2002-2003	190	8.92
4	2003-2004	229	10.75
5	2004-2005	119	5.59
6	2005-2006	108	5.07
7	2006-2007	193	9.06
8	2007-2008	159	7.46
9	2008-2009	481	22.58
10	2009-2010	189	8.87
	Total	2130	100

Figure No. 8 Chronological Distribution of Citation :



It observed from the table no. 13 and figure no.8 that near about 12.30% document citation published during 2001-2002, near about 22.58% document cited were published during 2008-2009 will 10.75% citation were published during 2003-2004.

Language wise Distribution of Citation

To make citation analysis of the language and type of document used by Authors, the citation is the chief source

of analysis the data given period is collected and sub grouped as per the language of the document.

Table No. 14 Language wise distribution of citation

Sr. No	Name of Language	No. of Citations	Percentage (%)
1	English	1949	91.5
2	Marathi	163	7.65
3	Hindi	10	0.47
4	Urdu	8	0.38
	Total	2130	100

Figure No.9 Language wise distribution of citation

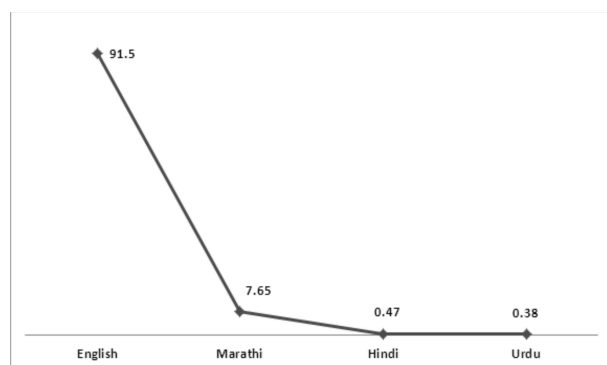


Table No. 14 and figure no. 9 shows that out of 2130 citation, 163 citations are in **Marathi Language**, 1949 citation are in **English Language**, 10 citations are in **Hindi** and Other language. This indicates that the hypothesis “**Mostly English language is preferred**” (Hypothesis No.3) is valid.

Conclusion and Suggestions :

While conducting the study at the time of analyzing the data some suggestions came up.

1. Researcher of Geography while citing the works of different authors should cite bibliographical details of cited document, author of document, year of publication, place of publication etc.
2. In order to improve the stander of research, researcher should be given proper training by Library staff for bibliographic citations. Through this it would be helpful to new researcher to make of the required literature.
3. In order to know the most popular author most useful books, journals, and articles. It is necessary to undertaken wider research study. Ph.D. Thesis submitted to different universities may be considered for data collection and analysis. This would be useful to know about the citation pattern of thesis.

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Application of Cloud Computing and Academic Library Services

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ABSTRACT :

Cloud Computing is a new technique of Information Technology used to practice of storing, accessing and sharing data, applications and computing power in cyberspace. Cloud computing came up as a boon for libraries and is offering various opportunities for libraries to connect their services with Clouds. Libraries may be placed their data and information in the Cloud. This paper overviews the basic concept of cloud computing, its meaning & definition, model of cloud computing, components of cloud computing, advantages & disadvantages, security concerns and application of cloud computing for library services. This paper also tries to give the idea that how cloud computing help libraries to provide a better service to their users.

Keywords: Cloud Computing, Information Technology (IT), Internet, Network, Social Networking, Library Services, Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS).

1. Introduction :

Cloud computing is a kind of computing technology which facilitates in sharing the resources and services over the Internet rather than having these services and resources on local servers or personal devices. We can also say cloud computing is the delivery of computing services, storage, databases, networking, software, analytics and more over the Internet. Companies offering these computing services are called cloud providers and they charge for cloud computing services based on the usage, similar to how we are billed for water or electricity at our home for their usage. Some of the cloud computing service providers are Amazon, Yahoo, Google, Sales Force, Desktop Two, Zimdesk. Some of the cloud computing services adopted by public are YouTube which is used to upload and share the Videos, Slide Share to host the presentation, Google Docs for collaborative works and web based Email services like Gmail for communication.

Cloud computing provides the user to use various applications without installation of that application in their own computer to access their personal files or official documents at any computer with Internet access. Cloud computing is capable of bringing together collection of documents and resources stored in various personal computers, personal server and other equipment in to one place and putting them on the cloud for the use of the user community. We can access data from anywhere in the world easily.

In the era of Information Technology (IT), information is exploring in large scale and information needs of the user community are also growing quickly. Information Technology play very important role in handling library resources ranges from collection, storage, organization, processing and analysis of information dissemination. To meet the information needs of the user community and to provide better services libraries are adopting many new technologies. The recent technology trend in libraries are the use of cloud computing as a strategic tool for the purpose of

providing seamless library services with quality in a cost effective or economic way.

Libraries are using cloud technology for improving their services by adding more values. This technology has created a centre of attention to the users due to its cost effectiveness. The cloud based infrastructure can provide additional alternatives in the way that the library host its rich media collections. Cloud computing offers many possibilities for libraries that may help to reduce technology cost and increase capacity, reliability and performance for any type of automation activities. Libraries can build their computer system on web technology with cloud technologies so that user can integrate the system more easily. The modern concept of cloud and libraries has produced a new model called cloud libraries.

2. Definition :

A definition for cloud computing can be given as an emerging computer paradigm where data and services reside in massively scalable data centers in the cloud and can be accessed from any connected devices over the Internet. Cloud is a term used as a metaphor for the Wide Area Networks (like Internet) or any such large networked environment. It came partly from the cloud like symbol used to represent the complexities of the networks in the schematic diagrams. It represents all the complexities of the network which may include everything from cables, routers, servers, data centers and all such other devices.

Cloud computing is a model driven technology that provides configurable computing resources such as servers, networks, storage, databases and applications as and when required with minimum effort over the internet services. According to the National Institute of Standards and Technology (NIST) definition (2009), “*Cloud computing is a model for enabling ubiquitous, convenient on demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. Cloud computing is a model for delivery of resources as a service*”.

According to Wikipedia, “*Cloud computing is internet based computing, where by shared resources, software and information are provided to computers and other devices on-demand, like the electricity grid*”.

According to the Gartner Group, “*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*”.

Forrester defines Cloud computing as “*A pool of abstracted, highly scalable, and managed compute infrastructure capable of hosting end customer applications and billed by consumption*”.

3. Types of Cloud computing :

Cloud computing can be distinct into following two set of models.

3.1 Service models:

Most cloud computing services models fall into three broad categories: Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS). These are sometimes called the cloud computing stack, because they build on top of one another.

Infrastructure-as-a-Service (IaaS) :

Infrastructure-as-a-Service (IaaS) refers to most basic category of cloud computing services comprises a wide range of feature, services and resources which support to build a Virtual Infrastructure for computing. With IaaS, you rent IT infrastructure servers and virtual machines (VMs), storage, networks, operating systems from a cloud provider on a pay-as-you-go basis. Organizations can be developed entire infrastructure

on demand. Amazon Web Services, Rackspace, Savvis, HP, IBM, Sun and Google Base are the examples of IaaS.

Platform-as-a-Service (PaaS) :

Platform-as-a-Service (PaaS) refers to cloud computing services that supply an on-demand environment for developing, testing, delivering and managing software applications over the internet without managing the software and hardware at the end of user side. PaaS is designed to make it easier for developers to quickly create web or mobile apps, without worrying about setting up or managing the underlying infrastructure of servers, storage, network and databases needed for development. Amazon Elastic Cloud, EMC Atmos, Aptana and GoGrid are the examples of PaaS.

Software as a Service (SaaS) :

Software-as-a-Service (SaaS) refers to cloud computing services for delivering software applications over the Internet, on demand and typically on a subscription basis. However, it is not necessary for the users to buy the software, install and run, maintenance the applications on their own servers. With SaaS, cloud providers host and manage the software application and underlying infrastructure and handle any maintenance, like software upgrades and security patching. SaaS provides online email applications, free services, limitless storage, and remote access from any computer or device with an Internet connection.

3.2 Deployments models :

There are four different ways to deploy cloud computing resources: Public Cloud, Private Cloud, Hybrid Cloud and Community Cloud.

Public Cloud:

Public cloud is meant for general public use and open to all, which deliver their computing resources like servers and storage over the Internet. Microsoft Azure is an example of a public cloud. This kind of deployment model of cloud computing is developed by any cloud computing agency and having own policy, value, and profit, costing, and charging model. Some popular public cloud services include Amazon EC2, S3, Google App Engine and Force.com.

Private Cloud :

A private cloud refers to cloud computing resources used exclusively by a single business or organization regardless whether it is located in premise or off premise. There are several reasons behind the development of private cloud for organizations some key reasons include optimize utilization of existing in-house resources, security concerns including data privacy and trust.

Hybrid Cloud :

Hybrid cloud made from more than one cloud deployment that may be public, private, community and other cloud, also bound together by technology that allows data and applications to be shared between them. The Hybrid cloud is widely used by institutions and organizations because this model provides more facilities and flexibilities in making optimum use of their resources and accomplishing the tasks.

Community Cloud :

Community cloud is a joint venture of several organizations come together to build a cloud infrastructure as well as policies through which cloud services will be rendered. It may be for a particular organization or a group of organization, but they share common concerns such as their mission, policies, security, and so on.

In the community cloud model, cloud infrastructure may be hosted by a third party vendor or within one of the organizations in the community.

4. **Cloud computing and Academic library services:**

Today in this technological era, libraries are improved constantly by adopting many new IT technologies. The theories of conventional libraries have been changed now day by day. Introduction of new and innovative technologies like cloud technology helps libraries to provide better services to their users. Cloud computing offers many interesting possibilities for libraries that may help to reduce technology cost and increase capacity reliability and performance for some type of automated activities. Cloud computing has large potential for libraries. Libraries may put more and more content into the cloud. Data storage might be a main function of libraries, particularly those with digital collections storing large digital files can stress local server infrastructures. Moving data to the cloud may be a leap of faith for some library professionals.

A new technology and on the surface it is believed that library would have some control over this data or collections. However, with faster retrieval times for requests and local server space it could improve storage solutions for libraries. Libraries can host their own websites with the help of cloud technologies. Libraries can use cloud technology like Google Docs to store library documents by making one Google account and provide service to the user. Libraries would be scanned their Historical and Rare documents into a comprehensive, easily searchable database and would be accessible to any researcher with help of cloud technology. Libraries can build digital library, content management system, institutional repository, Inter Library Loan (ILL) system and Integrated Library System (ILS) from locally managed to vendor hosted environment, of their own with the help of cloud technology.

All though libraries have been using some of cloud computing services for over a decade like online databases, large union catalogues as cloud applications, the library community can further adopt the concept of cloud computing to strengthen the power of collaboration or cooperation and to build a major, fused existence on the worldwide network. Examples of Cloud Libraries are OCLC, Library of Congress (LC), Columbia Public Library, Exlibris, Polaris, Scribd, Discovery Service, Google Docs / Google Scholar, World cat, Encore etc.

5. **Advantages and Disadvantages of Cloud Computing :**

Cloud computing like any other technology also has its strength and weaknesses, which needs to be taken into consideration before implementing this new technology in any libraries.

5.1 **Advantages :**

In cloud computing most of the data is saved in cloud. Whatever we are doing on computer for even on MS Word is saved through internet. It's possible only because new generation of computers. Following are the advantages of cloud computing in academic library services:

- **Cost Effective:** Each library is facing acute shrinkage in budget. Purchasing infrastructural facilities recurrently and updating or up gradation of software and hardware is becoming a bothering issue for library. Cloud computing eliminates the capital expense of buying hardware and software.
- **Adjustable Storage:** In the traditional system, if the server is less than what we have. The server should be replaced with the new one. In cloud computing, the storage capacity can be adjusted according to the needs of the library, since the storage is controlled by the service provider. We are no longer restricted by our computer's limited storage space. We can simply save our data in the cloud and log in to view and edit it as needed.
- **Round the clock access from anywhere:** Once we register our self in the cloud, we can access the

information from anywhere, where there is an Internet connection available. Information can be retrieved from anywhere through internet with right authentication details and we can access whenever without any geographical location. Cloud Services also allow you to synchronize data across multiple devices. Since the service is available over the web, the service can be availed through browser from any part of the world.

- **Automatic and secure data backup:** Cloud computing provided automatic updates. Cloud computing makes data backup, disaster recovery and business continuity easier and less expensive, because data can be mirrored at multiple redundant sites on the cloud provider's network. Cloud computing provided the most advanced security procedures.
- **Increased collaboration:** Cloud computing allow exchanging enormous data and documents more easily and efficiently than ever before. Because of easier action library employees can share information, work on documents and shared applications simultaneously.
- **User centered service:** With cloud computing service of library will have a new leap in the future. In fact services provided by the libraries will become more users centered, more professional and more effective. This will helps the library to give more benefited services to their users.
- **Cloud OPAC:** In this Information Technology ear most of the libraries in the world are having their Catalogue over the web. These Catalogues are available with their libraries local server made it available over the web. If the Catalogue of the libraries made it available through cloud, it will be more benefit to the users to find out the availability of materials in the libraries.
- **Host Website:** With the help of cloud computing technology libraries can host their website. Libraries can use cloud technology like Google Docs to collect response to web form, Google Calendar for instructions and meeting room and Google Analytic to collect statistics about their website, catalogue and blogs.
- **Digital Library:** Library can build Digital Library (DL), Institutional Repository (IR), Content Management System (CMS), Inter Library Loan System (ILL) and Integrated Library System (ILS) from locally managed and vendor hosted environment, of their own with the help of cloud computing technology.

5.2 Disadvantages:

In spite of its many benefits, as mentioned above, Cloud computing also has its disadvantages. The biggest disadvantages of cloud computing are dependency upon network connectivity, security, technical issues, latency, privacy etc. which needs to be carefully reviewed. Following are the disadvantages of cloud computing in academic library services:

- **Constant connectivity:** Using cloud computing in the library services are the need for constant connectivity with Internet. If internet is down it will become impossible to work without internet. Varying bandwidth at the end might cause errors to creep in and this limits the use of cloud services.
- **Data Security:** Security is the biggest concern when libraries come to use cloud computing. Cloud computing is completely Internet based and all cloud based computing uses and stores data using the same network which makes it helpless to attack by hackers. When the libraries are dealing with sensitive data there is a risk of data loss owing to improper backup and system failure.
- **Technical Issues:** While cloud services enhance and ease library performance they are initially complex

to understand. Hence employees and users have to be trained for better utilization of cloud based services. Though it is true that information and data on the Cloud can be accessed any time and from anywhere, there are moments when the system can have some serious malfunction. Libraries should be aware of the fact that this technology is always prone to outages and other technical issues.

- **Downtime:** As cloud service providers take care of a number of clients each day, they can become over whelmed and may even come up against technical outages. Downtime, an obvious issue is the time taken for the user system to interact with machines in the cloud. Cloud based apps will have higher downtime than the native apps installed on a users system since there will be an added time of user end communicating with the cloud.
- **Inflexibility:** Choosing a Cloud computing vendor oftenly means locking the business into using their proprietary applications or formats. For instance, it is not possible to insert a document created in another application into a Google Docs spreadsheet. Furthermore, a company needs to be able to add or subtract Cloud computing users as necessary as its business grows or contracts.
- **Privacy:** Privacy loss is a big concern when we talk about cloud based library services. Data stored or shared on the cloud by large social networking sites are usually protected and can be accessed by only authorized people, but there is always a chance of accidental data leakage, mismatch and other failures.

6. Conclusion :

Cloud computing technology is a burning topic which is giving new dimensions to computers and other related industry. No doubt, Libraries are also moving towards cloud computing technology in present time and taking advantages of cloud based services especially in building Digital Library, Social Networking and Information Communication. Cloud computing is beneficial to the Library and Information Science as it is flexible, scalable, elastic, pay per usage, economy of scale, cost effective and no maintenance fee for hardware and software etc. Due to cloud computing we can access library data from anywhere, where there is an Internet connection available. The Cloud computing techniques and methods applied to Academic libraries, not only can improve the quality of services and utilization of resources, but also can make more extensive use of cloud computing to our work life.

Academic Institutions like Universities and Colleges are the core of innovation through their advanced research and development. Subsequently, Academic Institutions may benefit greatly by harnessing the power of cloud computing, including cost cutting as well as all the above types of cloud services. The Academic Libraries which do not have sufficient budget to acquire high end technology with proper hardware and software can choose cloud computing. In future, the advantages of cloud computing technology may increase its usability, which will relieve libraries and its professionals from the hardships in maintaining the servers, software and manpower.

Despite its many benefits as mentioned above, in practice the cloud computing libraries are facing the large number of technical and engineering problems and also some issues related to security, privacy, trustworthiness and legal issues were still not fully resolved. Therefore, it is time for libraries think seriously before clubbing libraries services with cloud based technologies and provide reliable and rapid services to their users.

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I have six honest serving men, They taught me all I knew

Their names are What, and Where and When;

and Why and How and Who - Rudyard Kipling (1865-1936)

ABSTRACT :

Design thinking has assumed a special place in today's world which is driven by digitization and increased use of artificial intelligence, Internet of things, Machine learning, Predictive and big data analytics. New principles of design thinking are solving innumerable types of complexities for industries which include healthcare, education, automobile, telecom, IT, retail, , FMGC and others. These principles are being engaged for solving current problems and even anticipate those that lie ahead. Many Indian and foreign firms are banking on developing a design thinking approach to creating the optimum value for customers and survival in the VUCA world. Most of the Ivey league business schools too have started emphasizing on the need to provide experiential learning and creative and innovative approach to design thinking for solving cases from simulated environments. Giant firms of the current millennia with billions of dollars of market capitalization like Apple, Airbnb, Ubers, Amazon and others have used innovative design-thinking approach for creating customer delight. Not to be left behind, Indian firms too have created ecosystems that support and nurture design thinking approach. As design has become a holistic process for all, the overriding message of this paper is that Indian firms and educational institutions must intensify the use of design thinking approach for customer satisfaction, market leadership and curriculum development. The paper presents the anatomy of design thinking based on secondary information from various research papers and annual reports of Indian firms.

Keywords : Design Thinking, Lateral Thinking, Scientific and Computational Thinking, Creativity and Innovation

Introduction :

Framework of relevance :

Webster dictionary defines "Design" as the creation of a plan or convention for the construction of an object, system or measurable human interaction as in architectural blueprints, engineering drawing, business processes, circuit diagrams and sewing patterns. However, with time the word "design" has obtained different connotations in different fields, for example fashion design, sound design, spatial design, coding design etc. As designing involves aesthetic, functional, economic, and sociopolitical dimensions of both the design object and design process, considerable research, thought, modeling, interactive adjustment, and re-designing become necessary for effective designing. Designing is therefore an act of creativity and innovation.

"Thinking" on the other hand is defined as the process of considering or reasoning about something in a rational and intelligent manner. Combining the definitions of "design" and "thinking", it may safely be concluded that design thinking is

the creative strategy used by designers during the process of designing.

Design thinking is also an approach that can be used to help resolve issues within professional design practice and has been applied in business as well as social context. Design thinking in business uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer delight and improved market share. Design thinking involves cognitive activities that designers apply during the process of designing.

Literature Review :

Design thinking as a concept can be traced back to Herbert A. Simon's book in 1969 "The Sciences of the Artificial" wherein he suggested that certain phenomena or entities are "artificial" in the sense that they are contingent to the goals or purposes of their designer. In other words, they could have been different had the goals been different (as opposed to natural phenomena which are necessarily evolved given natural laws). Simon suggests that since artifacts are contingent, science of the artificial possibility remains a big question and he also deals with the artifacts empirically. He also deals with the notion of complexity because "artificiality and complexity are inextricably interwoven. Herbert A Simon argues that natural science is familiar to us, especially physics and biology, but the world around us is mostly man-made and artificial. It evolves with mankind's goals. So, science must encompass both natural and goal-dependent artificial phenomena. He discusses how to relate the two perspectives on artifacts, synthetic vs. analytic. The science of the artificial is really the science (analytic or descriptive) of engineering (synthetic or prescriptive). Artifacts are synthesized, may imitate appearances of natural things, can be characterized in terms of functions, goals, adaptation, and are often discussed in terms of both imperatives and descriptive. Fulfillment of purpose involves a relation between the artifact, its environment and a purpose or goal. Alternatively, one can view it as the interaction of an inner environment (internal mechanism), an outer environment (conditions for goal attainment) and the interface between the two. In this view, the real nature of the artifact is the interface. Both the inner and outer environments are abstracted away. The science of the artificial should focus on the interface, the same way design focuses on the "functioning".

Robert McKim's 1973 book "Experiences in Visual Thinking" believes that seeing is encountering reality with all of ones being. To encounter reality deeply, one cannot leave part of himself behind. All of senses, emotions, intellect, language-making abilities - each contributes to seeing fully. McKim's Experiences in Visual Thinking presented a goldmine of information and activities for those interested in the ways in which perceptual thinking skills can be observed, utilized and improved, and how powerful these skills are in their "capacity to change your world of ideas and things".

Bryan Lawson's 1980 book *How Designers Think*, primarily addressing design in architecture, began a process of generalizing the concept of design thinking. He talks about "design" as a process, how that process works, what we understand about it and what we don't, and how it is learned and performed by professionals and experts. In this book, the author tries to summarize his various researches and experiment works with design and designers - both professionals and students. He uses various examples for the various topics he covered. Suitable quotes have been given in every chapter to just communicate the essence in a simple way. With a unique viewpoint, Lawson follows a very scientific approach towards explaining various aspects of design.

He describes design as a "negotiation between problem and solution through the activities of analysis, synthesis and evaluation."

Lawson further describes designers as the creators of future and the responsibility that they have. "The designer has a prescriptive rather than descriptive job. Unlike scientists who describe how the world is, designers suggest how it might be." Paying attention to the thought processes which are required to identify and understand those design problems and create design solutions. From his discussions, we will come to realize that it is common for designers to carry some set of

guiding principles with them through their working lives. This intellectual baggage is most frequently gathered during that career, with each project contributing to it in some way.

Nigel Cross (2006), in his article ‘Designerly Ways of Knowing’ starts to explore what is specific to design knowledge, and what is specific to design compared to other scientific knowledge. This and other articles on similar themes were published as a book with the same name. Cross first explore the likeness and difference between design and other (natural) sciences. He then goes on to describes three different approaches to design within the scientific field. To deal with this unclear relation between science and design different approaches have been taken, and Cross identifies three, which he calls ‘scientific design’, ‘design science’, and ‘a science of design’.

- *Scientific Design* ”refers to modern, industrialized design based on scientific knowledge but utilizing s mix of both intuitive and non-intuitive design methods”.
- *Design Science* ”refers to an explicitly organized, rational, and wholly systematic approach to design; not just the utilization of scientific knowledge of artifacts, but design in some sense as a scientific activity itself”.
- *A Science of Design* means to approach design in itself as a subject of scientific investigation. The science of design is the study of design.

Research Problem & Methodology :

Firms and educational institutions are faced with dwindling level of customer (and students) delight and their own survival in the current scenario has become difficult. Things have become all the more complex due to the globalization of entities, technological enhancements and the overall change in the needs, wants and behavior of the society. The ability to retain leadership has become critical for all types of institutions.

Research has shown that institutions with high levels of design thinking culture are likely to yield better results and foster a stronger environment of innovation and creativity. The overriding purpose of this paper is to theorize the need for Indian firms and educational institutions to make use of design thinking approach for enhancing customer satisfaction, market leadership and curriculum development. The paper presents the anatomy of design thinking based on secondary information from various resources.

Dissecting “Thinking” :

Thinking is one of the most common fundamental human activity and yet no generally accepted definition of what “thinking” is or how is it created has been arrived at so far. In simpler terms, the act of producing thoughts or the process of producing thoughts is referred as thinking. Many human actions are driven by thoughts and therefore understanding its genesis and metaphysical origin has been the main focus of several disciplines artificial intelligence, machine learning, predictive analysis, biology, philosophy, psychology, and sociology.

In order to make sense of, interpretation, represent or model the world they experience, and to make predictions about that world, thinking is an integral part of the process. Therefore, organism with needs, objectives, and desires as it makes plans or otherwise attempts to accomplish goals must think, and think wisely.

One need not get confused between the thinking and attention. The cognitive process of selectively concentrating on one thing while ignoring other things is referred as attention. For example, listening carefully to what someone is saying while ignoring other conversations in the room (e.g. the cocktail party problem, Cherry, 1953). The cocktail party effect is the phenomenon of being able to focus one’s auditory attention on a particular stimulus while filtering out a range of other stimuli, as when a partygoer can focus on a single conversation in a noisy room. This effect is what allows most people to “tune into” a single voice and “tune out” all others. It may also describe a similar phenomenon that occurs when one may immediately detect words of importance originating from unattended stimuli, for instance hearing one’s name in another conversation.

Attention can also be split, as when a person drives a car and talks on a cell phone at the same time. Attention is one of the most intensely studied topics within psychology and cognitive neuroscience. Of the many cognitive processes associated with the human mind (decision-making, memory, emotion, etc.), attention is considered the most concrete because it is tied so closely to perception. As such, it is a gateway to the rest of cognition.

Metacognition or awareness and understanding of one's own thought processes refers to thinking about how you think. Many educational policies provide learners with more resources (e.g., new learning activities, study materials, or technologies), but less often do they address whether students are using these resources effectively. Hypothesizing students become more self-reflective & proactive about how they should improve their class room performance from the resources available to them can produce positive results. Researches have shown that use of metacognition helps students improve their performance.

On the other hand, if students were made more self-reflective about how they approach their studies and the available resources, they could do better since blind effort alone, without directing that effort in an effective manner, doesn't always get you to where you want to go.

A control group if it receives regular reminders of a test is expected to do better than the ones who do not. Further, if the group receives periodic useful resources, they are likely to do even better. The challenge then is to provide a well-designed structure of questions that will prepare them effectively to perform better. Researchers have found that strategic thinking had additional psychological benefits, helping students feel more empowered about their education. Students in the intervention group were also less stressed out about the upcoming exams.

Design Thinking in Business :

The digital world in which we live today is obsessed with ever improving customer experience and therefore creativity and Innovation has become a part of everything we do today. Every one of us is affected by it and it just doesn't matter whether you are a manager in a local or global organization, an entrepreneur of a startup firm, an official in a governmental organization or any other service pertaining to education, healthcare, finance or whatever. We all are expected to do things in a smarter manner which is different and lasting.

Innovations combined with dramatic design have time and again improved experience of products and services. Innovations led by design mode of thinking creates systems, processes and procedures which have improved the quality of life for end customers. Innumerable examples exist to tell the story that products or service models using design principles have outperformed the best of the best companies over the past ten years.

Many Fortune 500 companies of the world like Apple, Airbnb and others have proved that design has become an integral value of these firms which enables them to think like designers and develop effective strategies for development and bringing change. The world has already become VUCA (Volatile, Uncertain, Complex and Ambiguous) and moving to an era of inter-dependent challenges. The answer to all these rests on the integration of knowledge from various sources to seek solutions from ambiguous data and develop competitive strategies with holistic, integrated approaches.

Uber, Airbnb and many others are excellent examples of design thinking. Who would have thought that a new ridesharing service like Uber, an aggregator like Airbnb launched few years back are already worth \$200 billion by 2016 end. Even the entire focus on "Make in India" is driven by design thinking and many initiatives like "Swachh Bharat" abhiyan are being integrated to bring changes in Indian society are being carefully designed for improved effectiveness. Even educators of primary, secondary and higher education have started to look at design thinking-based pedagogy to help students gain insights from various perspectives, giving them the aptitude to solve world problems based on critical thinking and analysis. However, Dev Patnaik (2008) in his paper, "Forget Design Thinking and Try Hybrid Thinking," suggests that having someone experienced in the design field wouldn't necessarily be more advantageous for innovation than someone with a business background.

Design Thinking: Examples from Corporate :

Infosys: Infosys aspired for a customer-obsessed culture for effective digital innovation and by making use of design thinking principles at the core of the innovation process, it sparked a cultural change. Infosys used Design Thinking to shift its innovation culture and has motivated its clients too to change their approach for innovation.

Apple & Google: Both Apple, Google and many others innovate products which give “wow” factor and sets them apart from others. All these firms including some startups have discovered, that the secret lies in ‘Design Thinking’, which is what drives their competitive edge. As a result of this, while Apple products are sought after by one and all, Google search is simply brilliant and has transformative design. Even though Google has not churned out well-designed too many products, its Google Maps is arguably the only other Google product that truly disrupted incumbents through its design.

P&G & Pfizer: At P&G and Pfizer, support for innovation is a combination of people, resources, technology and a “do-it-yourself” approach modeled by leaders.

One of the most notable examples of design thinking for FMCG giant, Procter & Gamble, who harnessed design thinking to inform product development for Oil of Olay. After observing consumers in store, P&G realized that by targeting women over fifty, the skincare industry had overlooked a key segment: younger women in their thirties and forties.

P&G then tested prototypes, pricing models and store displays with these consumers, ultimately leading to the launch of a new product range designed to meet consumer needs.

Processes of Design Thinking in Education :

Analytical thinking amongst students involves systematic examination and evaluation of data or information, by breaking it into its component parts to uncover their interrelationships. Whereas design thinking includes the “stacking up of ideas”, with few or no limits, inside or outside of the box during a “thinking and brainstorming” phase. Use of design thinking approach during case discussions helps present better solutions and encourages input and participation from a wide variety of sources in the ideation phases. The phrase Outside the box thinking (or having no box at all for thinking) has been coined to describe one goal of the brainstorming phase in cases based discussions or simulation and is encouraged, since this can aid in the discovery of hidden elements and ambiguities in the situation and discovering potentially faulty assumptions.

The seven steps of design thinking approach for case based discussions and simulations in business schools are nonlinear for educational institutions, can occur simultaneously and can be repeated in any manner are as under.

1. **Definition of Problem** : Decide issues to be resolved presented in the case, agree on who the audience is, prioritize them in terms of urgency, determine what will make this successful.
2. **Research** : Establish a list of terms, conduct research, review the history of the issue; collect examples of other attempts to solve the same issue.
3. **Ideation** : Note the supporters of the idea or project, stakeholders, and critics, talk to end-users which may bring the most fruitful ideas for later design, take into account thought leaders’ (may be faculty) opinions, identify the needs and motivations, generate as many ideas as possible to serve these identified needs.
4. **Prototyping** : Combine, expand, and refine ideas, create multiple drafts, seek feedback from a diverse group of people, present a selection of ideas, reserve judgement and maintain neutrality, create and present actual working prototype(s), choose, review the objective.
5. **Selection** : Select the powerful idea(s).
6. **Implementation** : Plan tasks, determine resources, assign tasks, execute.

7. **Learning :** Make task descriptions, deliver and learn, gather feedback from the evaluator, determine if the solution met its goals, discuss what could be improved, measure success; collect data, document.

Although design is always influenced by individual preferences, the design thinking method shares a common set of traits, mainly; Creativity, Ambidextrous thinking, Teamwork, User-Centeredness (Empathy), Curiosity and Optimism.

Design Thinking vs Computational Thinking in Education :

Computational thinking as a thought process has been defined by Jeanette Wing (2012) as formulating a problem and expressing its solution in a way that a computer-human or machine can effectively carry out.

It is the process of abstraction by; choosing the right abstractions, operating in terms of multiple layers of abstraction simulations and defining the relationships between layers guided by efficiency, correctness, and flexibility. Computational thinking can best be related to as writing codes or software's. Every action or non-action is accounted for in the way computational artifacts are constructed. Computational thinking is great for working out a solution but there is an argument that computational thinking does not put enough emphasis on the problem itself.

Design thinking, on the other hand, attempts to understand the intent or problem before looking at any solution - computational or otherwise. Design thinking attempts to identify why the problem exists in the first place before solving it. The difference between the two can best be explained by an experiment wherein one needs to move 20 boxes from one part of the town to the other side of the town. A computational thinker would ask questions like what are the sizes of the box, how heavy are they or they contain anything fragile. A design thinker on the other hand would ask the basic question as to why one would want to move the box at all. Such a type of question may throw a new light and interesting conclusions may be drawn that there may not be any need to move boxes as something inside the box needs to be moved, and not the box itself. Design thinking shapes computational thinking and it is design thinking that needs to be given the highest priority in our education system when teachers teach complex theories in childhood and kids always wonder as to why should they learn all these at the first place.

Conclusion :

In our world dominated by IoT, AI, ML, Gamification, Big Data and Predictive Analysis, design thinking as an approach helps solve not only today's problems but even anticipates those that lie ahead. Many Indian and foreign firms are banking on developing a design thinking approach to create optimum value for customers and survival in the VUCA world. A robust system and culture that encourages creative and innovative approach to solutions will only survive the test. Whichever industry we look at, innovative design-thinking companies with an environment that supports manufacturing or service offerings are the ones with massive market capitalization. The aim of all Indian firms of all ages, including which are still at the incubation stage is to create an ecosystem that supports the growth of design thinking approach. Design Thinking benefits from starting both bottom-up and top-down at once; inviting everyone who wants to be an innovator, not forcing everyone to go to class. It is all about offering freedom to experience.

As educational institutions have the responsibility of talk about the "*next best practices*", the entire industry is looking at them to prepare students who are not just entrepreneurial, but have the proper grooming on platforms that involve design thinking approach to creativity and innovative thinking. The quality and originality of ideas that will then generate from these institutions and their students will be far better and well received by the industry. By enabling collaboration and design thinking approach for curriculum development and pedagogy, a new style and culture of learning will help society prevail for a better future for everyone.

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ABSTRACT :

In the present study, output and citation analysis of research activities in engineering in the world are mapped during 2002-2016. The study aims to promote the awareness of the global research output in engineering. With this aim, Scimago Journal & Country Rank data (Scopus® database of Elsevier) has been accessed for obtaining the required scholarly publication data. An attempt for evaluation on different qualitative and quantitative parameters like number of publications, citation analysis, research output, and h-index has been done. With these indicators in the research, analysis and assessment of total 7252275 publications from engineering field were done. The results show that out of the total research output, China stands first with 22.22% share of the research and is followed by United States (17.78%) and Japan (6.04%). Outstanding countries in engineering research have significant impact and 68.93% of the total global engineering research has been done in 10 leading countries. During the period of study, the research output of engineering has improved considerably with an average annual growth of 6.88%.

Keywords: Research Output, Citation Analysis, Engineering Research, Global Research.

1. Introduction :

Research in engineering plays a very important and vital role and indicators like number of articles, author, citations and impact factor etc are being used for measuring the research of the organization. The organization uses these indicators in various recruitment and promotion activities. Scopus, through its Journal Citations Report (JCR) indexes the specialist journals which helps the researchers in locating the required information of an interested subject. The diffusion of articles published in journals indexed in JCR is increased and the articles get more citations, in turn, increasing the impact factor and international recognition. The impact and quality of the research can be quantified by the tools which are provided by The SJR and are very useful in understanding and applying the concept for the researchers. The researchers can easily find out data for their researches, which are the leading countries and the analysis can be done with different angles. But in spite of the fact that a very valuable analysis can be done which can be of very help, no study has been done to analyze the global engineering research data.

The study is done with the aim of uncovering the status of engineering research in the world. The results of the study are focused on global engineering research and different valuable information can be extricated.

Valuable analysis can be done to reveal the status of research in engineering. The bibliometric indicators from the SCImago Journal & Country Rank database can be used as per the website statement. According to the website "The SCImago Journal & Country Rank is a publicly available portal that includes the journals and country scientific indicators developed from the information contained in the Scopus® database (Elsevier B.V.)." (SJR, 2017)

2. Review of Literature :

The present study tries to explore the research output and citations analysis within the field of engineering. For this, the analysis of literature review is done by the authors.

The recent study on analysis of mechanical engineering research showed that in the field of mechanical engineering Japan has more achievements as compared South Korea and India. (Pattanshetti, D M and Harinarayana, N S, 2017)

It is clear through quantitative analysis for 25 years of faculty publications of the physics department, SP Pune university that the growth in the research output is steady although the faculty members are very active in research (Nagarkar, S., & Kengar, M., 2017) Most of the studies related to energy shows the availability of academic collaborations between the most dominant contributors like China, Italy and USA. (Chen, W., Liu, W., Geng, Y., Brown, M. T., Gao, C., & Wu, R., 2017). (Patra, S. K., & Muchie, M., 2017) mapped the scientific productivity of engineering research in African Union member countries. The used Scopus® database to map engineering publications data and analyzed that in spite of a tremendous growth in publications in the recent period, the engineering is not favorite area of research. They established that South Africa has more global and African collaborator countries in research in comparison Africa.

(Hussain, A., & Swain, D. K., 2011) inferred that, in the pinnacle of the research in Computer Science, major part is the collaborative research. Akyildiz, I. F (USA) is the most sought after author. Likewise, European Journal of Operational Research is the most sought after journal and Wireless sensor networks: a survey by Akyildiz; Su; Sankarasubramaniam; and Cayirci is the top paper with a record 3879 citations. USA is the top productive country and has the momentous impact in Computer Science field.

(Cañas-Guerrero, I., Mazarrón, F. R., Pou-Merina, A., Calleja-Perucho, C., & Suárez-Tejero, M. F., 2013) studied that structuration and complexity in research is increasing. 87% of the research is done in 30 countries and USA (2013) produces 27% of the total research followed by China, Germany, India, South Korea, Turkey, Spain, and Iran. They also established that 96.2% of the total publications is carried out in English language and is distantly followed by the German language (2.2%). The journals having higher IF have wide boundaries in terms of diffusion and internationalization of publications.

(Pandita, R., Singh, S., & Gaur, R. C., 2016) have noticed a steady growth (annual 58.90%) in medical sciences research publications in the country, with maximum research contribution from AIIMS.

(Pandita, R., & Singh, S., 2014) studied that research is disproportionate in oncology field in the world They also suggested that support efforts like creation of infrastructure for biomedical research and sustainability programmes should be provided to all the under-developed nations by the leading countries in oncology research like the United States, Japan, the United Kingdom, France, Germany, China, etc., which in turn will help in promotion of research in the field.

(Ravichandra Rao, I., & Suma, M., 1999) found in their analysis that of the Indian engineering literature only a few journals and some selected institutions were involved in research in engineering in India. However, research output in bioengineering, applied physics, information science and light and optics are increasing in India and at global level. (Kaur, H., & Gupta, B. M., 2009) in their study of microbiology and immunology publications during 1999-2008 analyzed the performance of India. They analyzed the publications on different parameters like annual average country growth rate, global rank and share of publications, international collaborative partners and their profiles, communication patterns journals both at national and international level and some common characteristics the most productive authors had. (Jesiek, B. K., Borrego, M., Beddoes,

K., Hurtado, M., Rajendran, P., & Sangam, D., 2011) analyzed the major global trends in engineering education and suggested for collaborations at cross-national levels also. They also suggested some steps through which global capacities can be built in engineering education. (Panat, R., 2014) found in his study that China is ahead in research output as compared to India. (Banshal, S K, Singh V K, Basu A & Muhuri, P K, 2017) found that top 5 engineering disciplines attract most of the decision makers in fund allocation and policy making and most of funds are allocated to these. The research output of the India's most prestigious engineering and technology institutions like IITs with international institutes like MIT-USA and NTU-Singapore was compared in the study.

(Barrot, 2017), (Zou Y., & Laubichler, M. D., 2017), (Nobre, G. C., & Tavares, E., 2017) (Singh, V. K., Banshal, S. K., Singhal, K., & Uddin, A., 2015), (Hadagali, G. S., & Anandhalli, G., 2015), (Elango, B., Rajendran, P., & Bornmann, L., 2016), (Bhattacharya, S., Shilpa, & Bhati, M., 2012) (Gupta, B. M., Kshitij, A., & Verma, C., 2010) and (Sangam, S. L., & Keshava & Agadi, K. B., 2009) are of the studies done to assess the growth of scientific research output .

3. Problem Statement :

The obsolescence of literature depends mainly on two facts. The first is if the research is being done at a very fast rate and at large scale, then the immediate past literature becomes obsolete. Also if the research is not done as per the future requirements, then also there are more chances of the literature obsolescence. In the modern era of information explosion, the first reason seems to be major cause of literature obsolescence because the research is being done at a very fast rate and the literature in engineering research is increasing day by day. Thereby, it is very difficult to know the growth rate of research output in engineering at global level.

4. Objectives of the Study :

After discussion over the literature survey and analytical framework, the study strives at following key research objectives:

- To measure the growth rate and overall status of research in engineering at global level.
- To know the most outstanding countries in the field of engineering research.
- To study the research output in engineering in 10 outstanding countries .
- To analyze the status of citations and self citations using different parameters at world level
- To know the status of citations per document in the field at world level

5. Methodology :

Keeping in mind the objectives of the study, the required data to measure the research output was retrieved from the website of SJR -SCImago Journal and Country Ranking" at the below link: <http://www.scimagojr.com/countryrank.php>

(The list of countries is given in Appendix A). To measure the output of research in engineering, the Scopus® database which is largest database for indexing and abstracting covering more than 28606 scholarly journals from various subject areas. The year wise data was revealed by entering subject area as engineering with all subject categories and all regions. The data for the period of 2002-2016 was exported in raw csv comma delimited MsExcel®.

6. Data Analysis and Discussion

Percentage has been drawn up to two decimal points and has not been rounded off. So at places, it may reflect a slight variation while computing data for 100% figure.

Table 1: Ranking of the outstanding 10 countries during the period of study (2002-2016)

Country	Rank	No. of Publications	Global Share %	CG%
China	1	1611732	22.22%	16.67
United States	2	1290001	17.78	2.22
Japan	3	438084	6.04	1.22
Germany	4	332909	4.59	4.61
United States	5	295116	04.06	4.63
South Korea	6	239246	3.29	7.82
India	7	233298	3.21	14.67
France	8	173554	2.39	4.60
Italy	9	192946	2.66	6.43
Russian Federation	10	130935	1.80	5.91

Table 2: Year wise growth of engineering research in leading 10 countries

Country	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	(Share %)
China	21427	24817	42105	63792	71398	84430	100694	105791	123035	156788	162935	176286	186668	143258	148308	1611732 (22.22%)
CG%		15.821	69.662	51.507	11.923	18.253	19.263	5.0619	16.3	27.434	3.9206	8.1941	5.8893	-23.255	3.5251	16.67%
United States	65443	72273	88137	100210	89862	83212	83253	84980	89619	88539	87391	89919	92508	89521	85134	1290001 (17.78%)
CG%		10.437	21.95	13.698	-10.326	-7.4002	0.0493	2.0744	5.4589	-12051	-12966	2.8927	2.8793	-3.2289	-4.9005	2.22%
Japan	22907	25948	27506	35533	34728	30925	29989	30406	30914	30122	29587	29246	28774	25900	25599	438084 (06.04%)
CG%		13.275	6.0043	29.183	-2.2655	-10.951	-3.0267	1.3905	1.6707	-2.5619	-1.7761	-1.1525	-1.6139	-9.9882	-1.1622	122%
Germany	14224	16150	18954	22334	21358	21776	22065	22378	22745	23879	24627	24019	26769	25723	25908	332909 (4.59%)
CG%		13.54	17.362	17.833	-4.37	1.9571	1.3271	1.4185	1.64	4.9857	3.1325	-2.4688	11.449	-3.9075	0.7192	4.61%
United Kingdom	12855	14039	17126	20165	19328	19628	19902	19961	20258	20623	20428	20847	23523	23007	23426	295116 (04.06%)
CG%		9.2104	21.989	17.745	-4.1508	1.5522	1.396	0.2965	1.4879	1.8018	-0.9455	2.0511	12.836	-2.1936	1.8212	4.63%
India	4826	5282	6352	7492	9084	9975	11668	12517	13939	17447	19783	21612	28811	33024	31486	233298 (3.21%)
CG%		9.4488	20.257	17.947	21.249	9.8085	16.972	7.2763	11.361	25.167	13.389	9.2453	33.31	14.623	-4.6572	14.67%
South Korea	7337	9044	10663	13049	14954	16198	15613	15410	17366	18416	19052	19777	21190	21059	20118	239246 (3.29%)
CG%		23.27	17.9	22.38	14.6	8.319	-3.612	-1.3	12.69	6.046	3.454	3.805	7.145	-0.618	-4.468	7.82%
France	9675	10127	12416	14241	15092	14934	16278	16533	16567	17494	17798	18155	19419	18767	17609	173554 (2.39%)
CG%		4.6718	22.603	14.699	5.9757	-10.469	8.9996	1.5665	0.2056	5.5955	1.7377	2.0058	6.9623	-3.3575	-6.1704	4.60%
Italy	7384	8046	9601	10883	11274	11956	12287	12665	13233	13491	14270	15157	17597	17784	17318	192946 (2.66%)
CG%		8.9653	19.326	13.353	3.5928	6.0493	2.7685	3.0764	4.4848	1.9497	5.7742	6.2158	16.098	10.627	-2.6203	6.43%
Russian Federation	8453	7762	8182	8163	6388	6827	6604	6551	6747	7534	7496	8160	11736	13727	16605	130935 (1.80%)
CG%		-8.1746	5.411	-0.2322	-21.744	6.8723	-3.2664	-0.8025	2.9919	11.664	-0.5044	8.8581	43.824	16.965	20.966	5.91%

* CG % = Corresponding Growth Percentage, the formula for determining CG is:

Present year figures -previous year figures / previous year figures * 100.

It is evident from the above tables 1 & 2 that during 2002-2016, total 4999372 articles were published by 10 leading engineering research countries. Out of these, the China has the highest publications share at global level with 32.23% (1611732 articles) share and is followed by United States (1290001, 25.80%) and Japan (438084, 8.76%) respectively. 332909 articles (6.65%) were published in Germany. Likewise, UK has a share of 5.90% with 295116 articles and India has 4.66% share with 233298 articles. South Korea has published 239246 articles

(4.78%), France 173554 (3.47%), Italy 192946 (3.85%) and Russian Federation has published 130935 articles (2.61%) during the period of study.

During the data analysis, it was revealed that the leading countries have a contribution of 68.93% (4999372) in the total publications during the study and the contribution of the rest of the world is (2252903, 31.07%). China has the highest Corresponding Growth Percentage (16.67%) and Japan has the least (1.22%) during the period of study.

During the study period the publications of the leading countries grew with an annual growth of 6.87%.. China has the highest growth and leading with 16.67% growth. India follows China with 14.67% and in turn is followed by South Korea 7.82% ,Italy 6.72% and Russian Federation with 5.91% annual growth. United Kingdom has 4.63% growth and is followed by Germany (4.61%) and France (4.60%). The average annual growth of USA is mere 2.22% and Japan has the least growth with only 1.22%.

6.1 No. of Citable Documents:

By citable documents we mean those research publications appeared in peer-reviewed or refereed journals.

The nature of journals can be either open access or commercial. There is no denial of the fact that in today's technological era, the researchers can publish their researches in many forms like web portals, own blogs, websites and many more. However, articles in only peer reviewed and referred journals are considered more authentic, credible and are considered most for citations.

Graph 1: Shows that China has the highest growth rate.

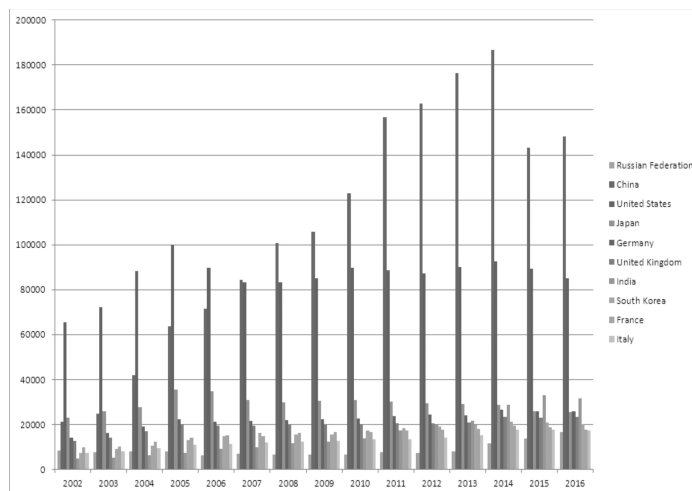


Table 3 – Citable documents in leading countries

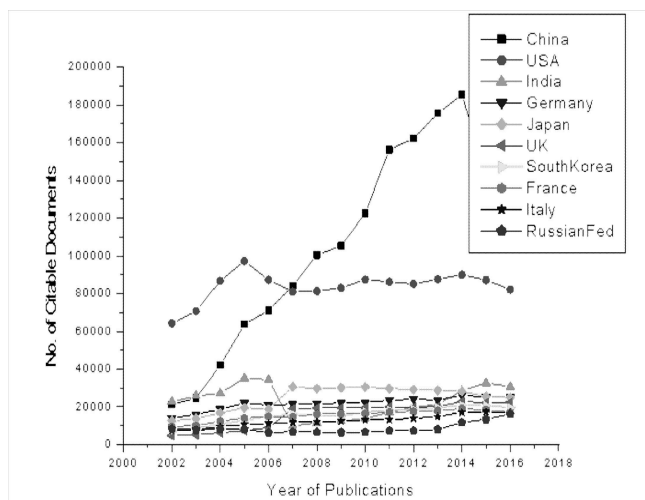
Out of the total 7255275 published articles during the study period, 98.43% (7141707) articles over the globe were citable. Once again, China leads the chart with 23.67% global share. US follows with 18.52%

Country	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total	(Share
China	21368	24733	42017	63670	71244	84270	100461	105361	122657	166348	162327	175635	185586	142182	145738	1603597	23.67%
CG%		15.748	69.882	51534	11896	18.284	19.213	4.8775	16.416	27.468	3.8242	8.1983	5.6657	-23.39	2.501	16.57%	
United States	64214	70742	86839	97366	87351	81074	81334	83112	87462	86295	85167	87700	90110	87250	82232	1258248	18.52%
CG%		10.166	22.755	12.122	-10.29	-7.186	0.3207	2.186	5.2339	-1.334	-1.307	2.9742	2.748	-3.174	-5.751	2.10%	
India	22716	25781	27232	35177	34415	9860	11552	12387	13796	17265	19636	21382	28441	32679	30703	343022	5.06%
CG%		13.493	5.6282	29.175	-2.166	-7.135	17.16	7.2282	11375	25.145	13.733	8.8918	33.014	14.901	-6.047	7.15%	
Germany	14075	15984	18769	21990	20973	21376	21703	22020	22333	23434	24111	23526	26197	25160	25196	326847	4.82%
CG%		13.563	17.424	17.161	-4.625	19215	15298	14606	14214	4.9299	2.889	-2.426	11353	-3.958	0.1431	4.48%	
Japan	12618	13738	16854	19547	18800	30657	29681	30061	30547	29705	29166	28798	28234	25409	24963	368768	5.44%
CG%		8.8762	22.682	15.978	-3.822	63.069	-3.184	12803	16167	-2.756	-1.848	-1.228	-1.958	-10.01	-1.755	6.21%	
United Kingdom	4751	5201	6288	7398	8968	19048	19359	19427	19675	19991	19777	20220	22828	22249	22453	237633	3.50%
CG%		9.4717	20.9	17.653	21.222	112.4	16327	0.3513	12766	16061	-1.07	2.24	12.898	-2.536	0.9169	14.21%	
South Korea	7211	8895	10592	12976	14862	16115	15496	15246	17216	18281	18808	19501	20831	20666	19588	236284	3.48%
CG%		23.353	19.078	22.508	14.535	8.4309	-3.841	-1.613	12.921	6.1861	2.8828	3.6846	6.8202	-0.792	-5.216	7.78%	
France	9589	10050	12328	14089	14910	14769	16082	16314	16322	17241	17500	17901	19056	18352	17144	231647	3.41%
CG%		4.8076	22.667	14.285	5.8272	-0.946	8.8902	14426	0.049	5.6304	15022	2.2914	6.4522	-3.694	-6.582	4.47%	
Italy	7306	7938	9503	10709	11083	11762	12061	12444	12986	13235	13960	14812	17217	17386	16730	189132	2.79%
CG%		8.6504	19.715	12.691	3.4924	6.1265	2.5421	3.1755	4.3555	19174	5.4779	6.1032	16.237	0.9816	-3.773	6.26%	
Russian Federation	8428	7738	8157	8139	6359	6800	6586	6510	6660	7382	7226	11649	13504	16162	129392	190%	
CG%		-8.187	5.4148	-0.221	-2.187	6.9351	-3.147	-1.154	2.3041	10.841	-2.113	11.985	43.957	16.924	19.683	5.7394	

and is followed by Japan (5.44%), India (5.06%) and Germany (4.82%). UK shares 3.5%, France 3.41%, Italy 2.79% and Russian Federation has 1.9% share at global level.

Graph 2: No. of citable documents

The citable documents have the annual growth of 7.20% at global level during the study period. Leading ten countries have produced 68.95 % of the total citable documents. The rest of the world has 31.05% share of the total citable documents in the area of engineering research.



6.2 No of Citations

Citation means the way to tell the readers that some certain material has come from another source. The necessary information regarding the material source is also provided to the readers like the author, title, link of the source etc. Table 4: Number of citations in outstanding countries

The total numbers of citations during the study period were 55322605 and the average annual growth of citations per document was 7.20%. It is evident that the maximum citations 3913312 (12.89%) were received in the year 2006. United States leads with 13814656 citations and has 27.90% share at global level. Russian Federation has the least contribution with 0.83% share only. The outstanding ten countries have the 66.48% share and rest countries of the world have 33.52% of the total citations.

Graph 3: No. of citations in leading countries

It is evident from the graph given above that average numbers of citations have decreased continuously from 2002 to 2016. China has the maximum growth between 2009-2013 but has also decreased 2013 onwards. USA has the maximum citations during 2004-05 but decreased the citations in 2016.

6.3 Self Citations

Giving reference of own article from the same journal is called self citation. It is very helpful for the researcher to increase the visibility and awareness of the research among his peers.

Table 5: No. of Self-Citations

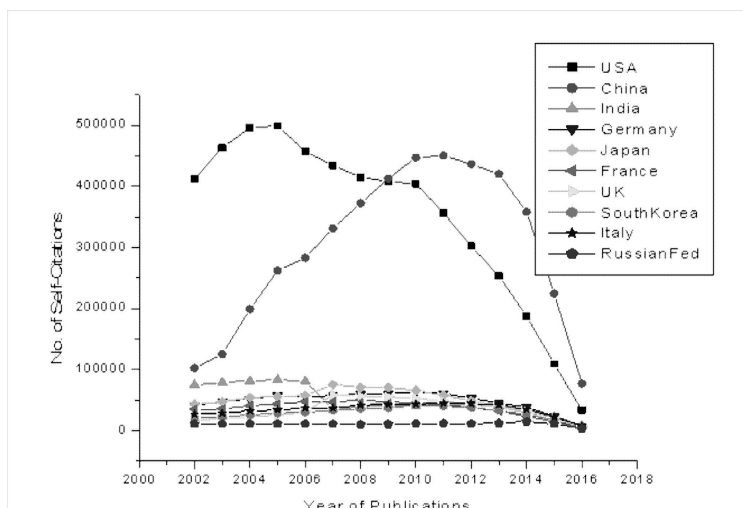
The United States leads the world with (5233721, 29.02%) global self citations and is followed by China

Country	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total (Share%)
China	175879	219442	321941	410321	443574	519143	583469	639416	693001	687316	653023	614705	519673	320586	108734	6910223 (13.95%)
United States	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	1E+06	909561	751875	611735	449046	249642	71642	13814656 (27.90%)
India	240200	247592	257359	265183	255184	113233	123310	127367	120818	121288	111854	101437	81222	52259	18100	2236406 (4.51%)
Germany	188696	220669	228328	241416	227447	236295	232728	227056	232267	213635	176426	142813	117681	67479	20648	2773584 (5.60%)
Japan	217711	221786	264852	272921	269155	234364	214482	211562	195633	169554	135884	104598	79250	44032	14194	2649978 (5.35%)
United Kingd	57420	68313	75084	86174	102550	294500	260852	246329	230613	206281	178533	154838	122234	71950	22993	2178664 (4.40%)
South Korea	105126	117741	132297	142854	147840	158782	156152	159995	174414	162207	148492	121658	91147	54792	16113	1889610 (3.81%)
France	144013	152495	164866	184700	188030	180493	196504	179523	169304	159680	132281	112219	78427	46084	14009	2102628 (4.24%)
Italy	119559	123500	134976	146286	149644	146066	153659	152839	151516	139492	127852	112150	90557	55591	17779	1820566 (3.67%)
Russian Fed	30501	35142	32331	32330	34581	32626	28714	27364	28221	25661	23257	23233	24427	18085	6394	402867 (0.83%)

(24.97%) which is in turn, followed distantly by India (4.16%), Germany(4.02%), Japan (4.1%) and France

(3.04%).Some outstanding countries in the list are UK with 2.95%, South Korea with 2.42% Italy with 2.89% and Russian Federation with 0.92% global share of the total self citations in the area of engineering research during the period of study.

Graph 4: Self-Citations status



It is clear from the graph above that USA and China are the only giant with reference to self citations during the period. Yet there is a drastic decrease in the self citations. The trend has fallen during 2014-16 drastically both in USA and China, along with the whole world.

6.4 Citations per Document

Citations per document mean average number of citations received by the journal during the period. It is calculated by dividing the total number of citations

from total number of articles.

Table 6: No. of citations per document

It is clear from the table above that USA leads with highest with 10.45 average citations per document. Surprisingly, Italy has also emerged as the second highest with 10.02 average citations. UK has 9.63 citations and is followed by France(9.21), Germany (8.48), South Korea(8.35) and Japan(7.53). India received 6.91 average citations per document and is followed by China with 5.02 and Russian Federations with 3.61 citations per document.

Graph 5: No. of citations per document

The graph above shows the radical decrease in citations per document at the global level. The citations per

Country	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Avg
United States	17.44	17.89	15.48	13.53	13.7	13.99	13.33	12.54	11.67	10.27	8.6	6.8	4.85	2.79	0.84	10.45
Italy	16.19	15.35	14.06	13.44	13.27	12.22	12.51	12.07	11.45	10.34	8.96	7.34	5.15	3.13	1.03	10.02
United Kingd	11.9	12.93	11.82	11.5	11.29	15	13.11	12.34	11.38	10	8.74	7.43	5.2	3.13	0.98	9.63
France	14.89	15.06	13.28	12.97	12.46	12.09	12.07	10.86	10.22	9.13	7.43	6.18	4.04	2.46	0.8	9.21
Germany	13.27	13.66	12.05	10.81	10.65	10.85	10.55	10.15	10.21	8.95	7.16	5.95	4.4	2.62	0.8	8.48
South Korea	14.33	13.02	12.41	10.95	9.89	9.8	10	10.38	10.04	8.81	7.79	6.15	4.3	2.6	0.8	8.35
Japan	16.94	15.8	15.46	13.53	13.93	7.58	7.15	6.96	6.33	5.63	4.59	3.58	2.75	1.7	0.55	7.53
India	10.49	9.54	9.36	7.46	7.35	11.35	10.57	10.18	8.67	6.95	5.65	4.69	2.82	1.58	0.57	6.91
China	8.21	8.84	7.65	6.43	6.21	6.15	5.79	6.04	5.63	4.38	4.01	3.49	2.78	2.24	0.73	5.02
Russian Fede	3.61	4.53	3.95	3.96	5.41	4.78	4.35	4.18	4.18	3.41	3.1	2.85	2.08	1.32	0.39	3.46

documents were decreased severely during 2014-16. It happened in all the countries, including the leading ones.

7. Conclusion

It is very clear from the research undertaken that the research output is disproportionate in the field of engineering at the global level. 68.93% of the total engineering research globally has been done in 10 leading countries and the rest of the world has only 31.07% share. It shows that research is being done only in some countries and the rest of

the world by any reason, don't have proper research environment. During the period of study, the research output of engineering has improved considerably with an average annual growth of 6.88%.

The need of the hour is to create an environment at global level so that the research in engineering can be encouraged in the under-developed countries through all possible means. The help by the leading countries like technical support, funds, human resource training should be provided to the unnoticeable nations. The engineering research in the deprived and poor countries can be increased to a considerable degree by promoting the research related activities. A great help is required by the leading countries like USA, China, UK, Germany, India etc to promote engineering research at global as well as regional level. These countries should provide all the possible support for the needy nations for promotion of the research. Also the developing countries should also establish some intuitions dedicated to engineering research.

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ABSTRACT :

Medical colleges are important agents for producing the knowledgeable medical professionals and the libraries have an important role in teaching, and research. The aim of the paper is to outline the services provided by the library i.e. their administration, staff, collections, and technical infrastructure. The survey of library was performed keeping the two objectives in mind i.e. to gain an in-depth understanding of the functioning of the libraries and how the library could contribute to health information literacy for the patron and public. For the purpose the library staff was interviewed. The analysis was done by highlighting the strengths, weaknesses, threats, opportunities in current library system on the basis of responses and perceptions received from library staff and finally some recommendations were given in order to uplift the status of library and introducing any new service.

Key words : Health Information Literacy, Medical Library, SWOT Analysis

Introduction :

A medical college library is a special library as it collect, collects and organises specialises medical literature for supply to its clients. The clients consists of the persons who study in the college and the teaching staff who makes use of information for exploring new grounds in field of their specialisation. Medical libraries in these colleges possess working collections and are administered by qualified library staff, but due to economic reasons their development has been rather slow. Mittal (1978) stated, “education and library are like twin sister, true lovers and one cannot be apart from each other”. Considering the importance of the libraries, Kothari commission recommended that “no new university, college and department library in terms of staff, books, journals space etc, nothing could be more damaging to a growing department than to neglect or low priority”.

Brief Profile of Central Library of Medical College, Jammu :

The permanent building of government medical college complex was started in year 1976-77. The library block builds at the span of four years and inaugurated on 26 April 1982. The medical college function as a hospital and a teaching institute. Primarily, Government Medical College Central Library, collects, organises and provides the medical literature to its users. The Central Library of Government Medical College is situated at the first floor of the building (separated from the hospital building).

Services of the Library :

Broadly the library is divided in following units with section. These are:

The major services provided in library are:

- Reference service
- Interlibrary loan

- Reprographic service
- Internet service
- Circulation service
- Textbook
- Watch and ward
- Book bank

Table I : Sections in the library				
Unit	Book	Web- Zone	Technical Processing	Periodical
	Text book	Photocopying	Classification- colon	Current subscription
	Reference	Internet	Cataloguing-AACR-2	Back dated files
	Book		Indexing -Mesh	Bibliographic
	Post graduate		Shelf list	Library cooperation
	Circulation			Statistics
	Watch and ward			Watch and ward
	Statistics			

Table II: Resources and Services

Working Hours	
Summer	8 am to 8 pm
Winter	9 am to 8 pm
No. of Shifts	2 shifts
Holiday	6 hrs
Layout & Floor Plan:	15,100 sq. ft. over 1-1/2 floors
Reading Rooms:	4
For U.G/common	One
For P.G	One
For Staff	One
In each Accommodation	
Periodical Section	30 seats
Reference section	20 seats
Teachers' section	20 seats
Reading Hall	180
No. of books :	
Text :	9000 approx.
Reference	14950
Others	1197
Total	20,882
No of Journals Subscribed Annually	87
Indian journals	15
Foreign journals	72
Facilities available	Internet, Xerox
Design and Development of Collaborative Model of Health Information Literacy in Jammu Division (Unpublished Thesis)	

As the library is an academic library but not the health library it serves the health professionals, faculty and students and has no place for general public. The services and resources are quite basic and traditional. The library provides access to the professional books and journals. There are total 20,882 books (Text: 9000 approx., Reference: 14950, others: 1197) and journals subscribed annually are 87 (Indian journals: 15 and other countries' journals: 72).

The library provides reprography and Internet facility as a section called 'Web Zone' section! This is used for accessing their emails and social sites as said by a senior library assistant.

Staff of the library and their Professional Status

Table III: Staff

S.No.	Designation	Qualification
1	In charge library committee	MBBS, MD, HOD Pathology
2	Assistant librarian	M. Lib.
3	Sr. Library assistant	Graduate
4	Sr. Library assistant	Secondary (10th)
5	Sr. Library assistant	Higher Secondary (12th)
6	Sr. Library assistant	M.A.
7	Sr. Library assistant	Higher secondary (12th)
8	Chief Librarian	Vacant
9	Librarian	Vacant
10	Assistant librarian	Vacant
11	Library assistant	Vacant
Design and development of collaborative model of health information literacy in Jammu division (unpublished thesis)		

The table reveal the structure of the library which shows the professional and non-professional staff including the assistant librarian, and library assistant. It was found that the library is under the administration of a doctor i.e. non library and information professional. The table reveal that there are some situations which are still vacant and there is no Chief Librarian who generally supposed to possess leadership responsibility of the library. The professional staff consists of Assistant Librarian and Sr. Library assistant are five in number. The professional library staff possesses colossal dissatisfaction with the authorities of the Govt. Medical College, as still the health professionals treat them as the storekeeper but not as the information keepers. They don't have any kind of participation in library committees for books selection, and budgetary decisions.

Budget :

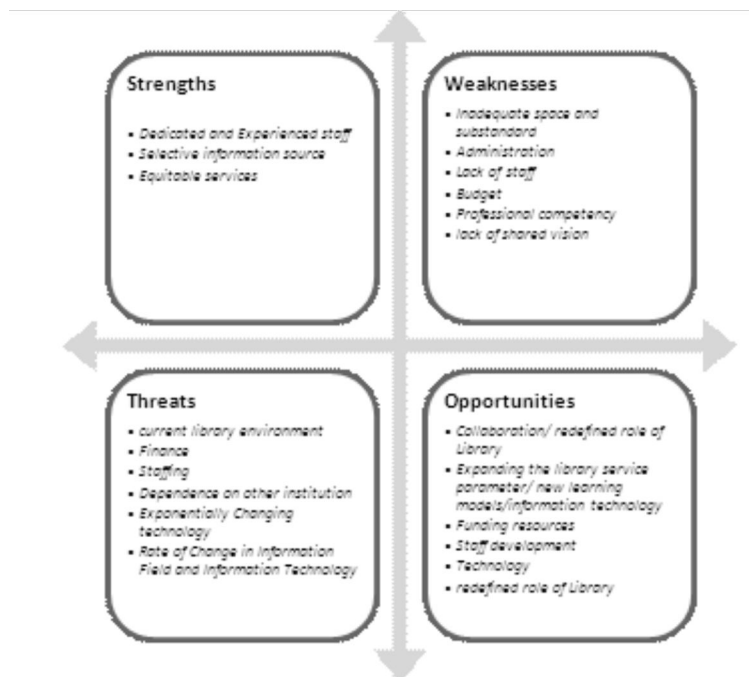
Traditional budget was prepared by the directions of the librarian. But presently because of the absence of the librarian since 1997, budget is being prepared by account section, keeping in view the requirement of the library. Library has no role in the purchase of the books and no scientific methodology is pursued. Principal with in charge library and HODs prepare and finalise the list of books and periodicals and approve it. The major part of the funds reportedly spends on reference materials and journals. All the budget decisions were made by the library committee having no library professional. The funds reportedly are being lost because the faculty rarely has any recommendation for improving the collection of library as they had their own sources for knowledge retrieval either print or non-print form.

Research Methodology :

The aim of the study is to find out the best possible role of medical libraries and suggest the best possible ways for the effective transfer of health knowledge to the various stake-holders in Jammu Region. Hence, the medical library system was examined for its practices, and the strength, weakness, opportunities and threats were studied by interview method with the staff of Central Library of Govt Medical College. In total seven interviews took place. Overall each interview took 40-90 minutes. The analysis were made on the basis of interviews conducted in 2011, 2013, and 2015 and drawn the major themes on the current services and practices. The inferences were drawn and, strength, weakness, and threats of health information services based on the perception of the library staff.

Discussion : Fig. 1. SWOT analysis

Strengths



- *Dedicated and Experienced staff*
- *Selective information source*
- *Equitable services*

Dedicated and Experienced staff: The strength of any library laid in its resources especially its collection. The medical library has a broad range of information resources. The library bears the responsibility to provide its resources in the form of books and journals to the academic staff and student. The library has basic and traditional collection focusing to fulfil the academic needs. It provides an access to the high quality professional books and journals. It holds both the current as well as retrospective materials. In total there are 20,882 books (Text: 9000 approx., Reference: 14950, others: 1197) and 87 journals

subscribed annually (Indian journals: 15 and other countries' journals: 72) were reported. The selective mode of collection development has made the library possible to meet the expectations of users and the directives of the medical college by possessing the most reliable health information sources. In majority collection is accessible to users in print form.

Selective information source: The staff feels that they are dedicated and take personal interest in fulfilling the needs and demands of the users. They are experienced and use their skills at the best for books and journals at the shelves, catalogue and bibliographic search.

Equitable services: The Library observe long hours for users both on working and non working days including public holidays and it endeavour to provide equitable services to its all types of users i.e. the students, and faculty. The Library provides an individual study space and computer lab pace.

Weaknesses :

- *Inadequate space and substandard*
- *Administration*
- *Lack of staff*

- *Budget*
- *Professional competency*
- *lack of shared vision*

Budget: The budget decisions are being made by the purchase committee (including the head of departments and principal). There was a general agreement on huge reduction of library budget which has an adverse effect on the library staff recruitment and other library resources i.e., substandard facilities, introducing the new technology, maintaining human and other resources etc.

Inadequate space and substandard: The inadequate or shoddy facilities for both collection and users are the prime weakness of the library. The poorly maintained buildings and general lack of cleanliness led to considerable risks to user oriented services. The out-dated and congested structures of government medical college make it convoluted to introduce the new equipment and technology, and lead to poor working conditions for staff. Inadequate space is the consequent inconvenience to users which has resulted to the split of stored collections and decentralization of library services with the teaching departments. The Library does not provide 24 hour a day study space, and other facilities for users, especially web Zone, are inadequate to meet the demand.

Administration: The major weakness of library is that it does not have any librarian since 1997. The leadership role for library services especially in this era, where the scientific knowledge is increasing exponentially and a skilled librarian can play an important role in the field and organisation. The transfer of authoritative power regarding to the decisions concerning the library and its services to non library professionals is degrading the professional competency and increasing the dissatisfaction among the staff. As the staff of the library revealed their low self esteem which is seriously obstructing their interest and affecting the library services.

Professional competency of Staff: Most of The library staff lacks the professional qualification which is necessary to deal with users. Professional competences seem to be at lower edge.

The reasons like aging or retirement age, and some health issues are also affecting the concert and their efficiency as; the number of staff was at the retirement age and consequently the library may face the loss of experience, knowledge, reference expertise, and familiarity with important print collections in near future. At present, there was no formal recruitment or replacement or succession plan for Library staff.

A majority of staff members feel that they lack the opportunity for professional development. Some believe that there is an insufficient integer of professional staff, and expressed that currently there is no scheme to rummage around for intact talent. Some staff feels that their work is often not valued much.

Lack of staff: Cuts in hiring the permanent and temporary staff have made, without considering the consequence on Library services (as judged by few professional staff) has resulted insufficient integer of the staff members who represent specializations in the different field of library and information science to embody various knowledge specializations in medical science too. The professionally untrained staff has to bear heavy workloads for accomplishing the library routine. A few professionally trained staff reported that, in such conditions it is difficult to keep up with growing user demands, and maintaining the uniformity in the library polices for collection development.

Reduced collection: It was reported that 'there were 329 journals subscribed in 1997 and now the number has been reduced to 87 because of lack of funds. One of the reasons in declining the number of resources was that, every teaching faculty had their personal published literature and Internet connections on their own desk to access the Internet based sources. College administration is more interested in providing personal internet connection to the faculty in their room instead of centralised information based services.

Lack of modern technology: In modern period of technology the library is still working with traditional library service models for communication and meeting information needs. The library provides reprography and Internet facility as a section called 'Web Zone'. The library in spite of having internet services in the campus it is not providing the Internet based resources. This is used for checking their emails and social sites as said by a senior library assistant. The libraries do not subscribe any online resources or databases. The library staffs do not get any assistance for the professional development and that why they lack the proficiency and had no experience in assisting members for searching online health information source. Hence there is need that administration should understand and must learn from global medical library practices for better academics, research and patients services.

Lack of shared vision: The staff sees a must for a co-ordinate collection development in between departments and library. There is a lack of communication on collection development. They feel that partnerships with departments are restricted and uneven. The college administration and bureaucracy has been shortsighted as far as the library's long-term policies are concern. They see a divide between state government, college management, and staff, which has consequently led to miscommunication, a lack of trust, and a lack of a shared vision as effecting.

The library should serve as a backbone of the library for feeding the research and faculty. Neglecting this in future would have serious consequences on the reputation and goodwill of the library.

Opportunities :

- *Collaboration/ redefined role of Library*
- *Expanding the library service parameter/ new learning models/information technology*
- *Funding resources*
- *Staff development*
- *Technology*
- *redefined role of Library*

Collaboration : In spite of many weakness library there are great prospects to construct and reinforce the collaborations at the local, regional, and national levels. The strengths of the library can be used and the role and profile of the Library to redefined. Thus, collaborations could be done in form of collection development, and resource sharing, which would not only share its resources but its expertise as well. Collaborations could be made so that the health information sources could be enriched technologically. The Medical library must increase its effort to reach beyond the college community by outsourcing its technical assistance regarding health information to the other libraries and its users. With this, the library could provide reference services, suggestions for acquisition and organization of health information collection for health information literacy program for public also.

Funding resources : It was found that there is a great need to increase the funding for libraries. Lack of funds reported provides an opportunity for the reassessment of administrative priorities and to consider other non-traditional funding sources. Increase in funding for the library to support health information resources and services for health professionals and students. Some feel that funds are losing day by day and the administrators rarely bother about their knowledge development. Increasing the funds for the library would also support health information resources and services for patients and other information seekers. So a broad conformity is required which suggest that the funds could be raised through new funding agencies may be from private and non-government sector e.g. library suppliers or publishers may also be included, others may involve the donations for the collections, facilities, and staff could also be approached.

Staff development : The librarian should be appointed on the priority basis to provide the leadership to the library. In

addition, professional competences could be raised by providing the career development programs for effective library services. Hiring the professional staff and inoculation of new skills could raise the opportunity of upgrading the current library services, its efficiency. These in addition provide an opportunity for reorganizing the structure of library services and current practices, and re-allocating the current resources. The library staff needs training in providing quality health information services so there is need to study the competences of staff and how their skills would built-up for their first hand participation in the health related services at the public domain. The senior employees from the public and university libraries could be deputed and better utilized for their knowledge, talents and skills. To demonstrate and enrich the information skills expertise the refresher courses, conferences and workshops could also be organized under lifelong programs.

Technology : An accelerating shift to paperless resources may lead to improved and cheaper services for patron and users. By hiring the professionally trained staff there would be a great opportunity for digitizing the library which would resolve the space related issues faced by the users but not the collection. It was also suggested that a resource center should be established outside the library which would primarily serves patients and public.

New models/information technology : Adopting new models and incorporating information technology in library services may led to expanding the parameters of library services which would provide an opportunity to enrich it with more health information sources which in return necessitate the provision of more receptive user services. Medical libraries would devote more resources and technologies to support health education curriculum. In addition the library could provide improved resources for library-based information services (online access to health information materials, interlibrary loans) in other institutions. Focusing the Web based information resources, and the introduction of personal bibliographic software would increase the more effective user based services both in and out of the library boundaries.

Threats

- *current library environment*
- *Finance*
- *Staffing*
- *Dependence on other institution*
- *Exponentially Changing technology*
- *Rate of Change in Information Field and Information Technology*

Current library environment: The collaboration may led to lose of autonomy. In addition the space problem in the medical library does not allow anybody to visit the library as it located in the congested college building. This would disturb the library services provided to the staff and students. That's why the staff feels that setting up a health information centre outside the GMC premises could be a better idea for serving external users.

Finance :As funding is not sufficient for the library thus the some of the library staff believe that such program by the library would further raise the deficit of the funds and would affect the primarily the basic need of the academic library. This further may led to inability to maintain the facility and update the technology. Indeed a separate health information resource centre could be that may be established as the first and foremost institute that could serve patients.

Staffing : Some staff member believed that this may led to an increase in workload. This may put an additional pressure and affect the quality based health information to the information seekers. The library staff lacks the technological knowledge regarding creating health information database so as to serve general public. Some of the staff is finding it difficult to keep update in the information technology and information field. They may only be helpful in the acquisition, classifying, creating reference lists or bibliography for the staff that would actively and more proficiently fulfil the health information

related demand. It may be difficult for the college to adapt health information literacy services as there will be need to redefine the role of academic library and health information literacy hub for general public.

Rate of Change in Information Field and Information Technology : It has become increasingly difficult for Libraries to keep up with the exponential rate of change in both information technology and the information field. Some staff members are concerned that management of electronic resources is becoming more complex and time-consuming.

Recommendations and Conclusion :

The crux of the problem is the finance. If adequate funds made available in the library various shortcomings can be avoided. Lack of grants led to the deletion of the subscription and less number of books are brought. The library should be kept up-to-date with latest literature and necessary information and must possess a working collection of latest medical literature required for use of the student and faculty. In order to minimize the problem like dissatisfaction, enhancing the trust on the library services, improving the library services and introducing the health information literacy programs in the library following are some recommendations for both the administrators of GMC Jammu, library staff and Government:

- The college management should strengthen the library by first of all hiring a librarian as the library administrator.
- The focus of the college management should be the improvement of the collection in terms of quality and quantity.
- The library staff needs motivation. The status of library and its staff should be upgraded to the college as per guidelines of the UGC and college librarian should be designated “assistant Professor.”
- Increasing the seating capacity of the library.
- The library should be work on global trends of automation.
- There is the need for effective surveillances inside the library, so CCTV should be installed on priority.
- Introducing information literacy programs for both the faculty and the students in priority.
- Cooperative acquisition program may be planned at the local level in collaboration with Public libraries, RRL Library, and libraries of University of Jammu.

The analysis revealed that the library professionals are still working in a deskbound environment where they are expected to take care of stocks in the library. Here the matter of concern is how these professionals can be involved in the mainstream of the health information retrieval. The library professionals need to be trained and hire such library staff who has received a professional training in both information science and basic medical sciences in order to find, synthesise and present information to medical terms on a routine basis. The medical staff needs to be outmoded by a more skilled professional health information librarian/ specialist, “paralleling the health care environment in which they work”. Thus by this, the libraries can build bridges between highly scientific health information resources and a layman/ common man. With this, there is also a need to function not only in a library but also at the community level. Keeping in view current space problem of the library it was also realised that establishing a health information resource centres can help general public to reach the maximum number of reliable health information resources and thus the reliable health information.

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ABSTRACT :

The 21st century has introduced so many new trends in the technology which results in new scenario of today's libraries. Library services need to improve, modernize its services to cope up with the needs of the users. Also it is the demand of technosavvy users'. The social media applications such as, Facebook, WhatsApp, Twitter, LinkedIn, Wikis, blogs, RSS Feeds, YouTube & Teacher Tube can be widely used in libraries due to its vast popularity in users. It is essential to libraries to promote its product using social media. Social sites are the popular ways to share information and knowledge. It enables the library professionals to share videos, audio files, texts and images amongst its users. This paper deals with what is social media, its features, the different marketing techniques used in the academic libraries using social media.

Keywords : Social Media, Facebook, WhatsApp, Twitter, LinkedIn, Wikis, Blogs, YouTube

What is Social Media?

1. Social media are computer-mediated technologies that facilitate the creation and sharing of information, ideas, career interests and other forms of expression via virtual communities and networks. Users typically access social media services via web-based technologies on desktop computers, laptops, or download services that offer social media functionality to their mobile devices (e.g., smartphones and tablet computers). The variety of stand-alone and built-in social media services currently available introduces challenges of definition; however, there are some common features:
 1. Social media are interactive Web 2.0 Internet-based applications.
 2. User-generated content, such as text posts or comments, digital photos or videos, and data generated through all online interactions, are the lifeblood of social media.
 3. Users create service-specific profiles for the website or app that are designed and maintained by the social media organization.
 4. Social media facilitate the development of online social networks by connecting a user's profile with those of other individuals or groups.
2. According to Computing Dictionary (2011), "Social networking site as any website designed to allow multiple users to publish content of them. The information may be on any subject and may be for consumption by friends, mates, employers, employees just to mention a few".
3. Powell (2009) defines "Social networking as a community in which individuals are somehow connected through friendship, values, working relationships, idea and so on".

Why Social Media implementation in libraries?

1. **Marketing of Library services:** It is very much essential to market one's product in this modern era to reach your customers. Libraries provide information & investing more amounts. As, 'Information is commodity & it can be sold', Library professional should make a good plan for the marketing of their services to draw attention of library users as the users are getting their information on one click. They carry the library in their mobile.
2. **Drastic change in library scenario:** The 21st century has introduced so many new trends in the technology which results in new scenario of today's libraries. It is now essential to provide & to market library services/products using social media. It is one of the nice opportunities to show library professionals that how effectively they will market their services using social media.

Social media is very rapidly becoming regular part of day today life. Almost all the youngsters are active on the social media. So, it is necessary & easy to deliver library services through Social Media e.g.. reference service, referral service, e-books, e-journals, previous year's question papers, different library circulars regarding students, different links of the websites which are useful for students, lecture notes, videos can be share through social media.

Uses of Social Media for the libraries?

Library professionals can deliver following library services through social networking sites.

1. Library notices and quick updates can be sent through WhatsApp & mail.
2. New arrivals list, images of the books can be shared through WhatsApp and Facebook.
3. Videos of different activities organized by the different departments, guest lectures can be share through Facebook, YouTube & WhatsApp.
4. Social Networking sites can be used to promote events organized by the library as well by the other departments of the Institute.
5. Discussion groups /forums can be formed for the scholarly discussion regarding the research amongst the researchers.
6. Libraries can provide reference services, referral services, CAS & SDI by using social networking tools.
7. Pdf files of question papers of various subjects & different links useful for the users can be displayed on the Facebook & on the website of the library.
8. Ask a Librarian and Twitter can be used to ask queries of the users.
9. Social Networking sites can be used for giving complaints, suggestions, enquiries, feedback.

Let us see how social media can be implemented in libraries effectively.

1. **WhatsApp:-**Librarian can make different WhatsApp groups of faculties & students according to their classes & departments & circulate the library related information among the groups.
2. **Facebook:-**By creating facebook page of the college library, librarian can disseminate the current & update notices, videos, photos of the different activities conducted by the college & different departments.
3. **Blogs:-**Librarian can create blogs for the healthy discussion of various topics such as current issues can be discussed which will be helpful for the students who are preparing for the competitive examination.
4. **Youtube:** - YouTube can be very effectively used to share the different videos of the lectures taken by the faculties, guest lecturers which will be results in easy understanding of the topic.

5. **Wikis:** It is a free online encyclopedia that gives a background knowledge and definition of concepts. It offers a platform for users to access, edit and contribute to content. This is a collaborative web page for developing web content. You can use this tool to share your knowledge by editing. You can also host your library websites on wiki software like PB Wiki.
6. **Teacher Tube:** Teacher Tube, which is a YouTube for teachers, presents an excellent opportunity for instructor-librarian collaboration. Instructors can guide students to helpful library resources, and vice versa.
7. **Twitter:** Librarian can keep the faculties, staff & students updated on daily activities / issues like frequently updated collections, new arrival, and current content services of library.

Users can send Instant Messages like feedback, complaints or ask questions on a particular issue.

Advantages of using Social Media :

1. Quick & fast delivery of the information.
2. It is the cheapest way to market the library products & services & draw attention of the users towards library.
3. Social networking sites are globally accessed hence libraries can get closer to the users.
4. Quick responses /actions from the users can be done. Thus active participation of the users can be done which helps in to develop library services.
5. Knowledge sharing can be done effectively through social media.
6. Social Media promotes effective distance learning.
7. Implementation of social networking tools in library fulfils all the five laws of library and information science.

Disadvantages of using Social media :

1. Lack of awareness of using social media.
2. There are so many social media sites available hence all are not acquainted with all the sites.
3. Main issue is privacy of the users is not maintained.
4. Electricity failure & low internet speed are the main barriers in the communication.
5. Less library staff & less training offered to them.
6. Lack of interest of library professionals.
7. Insufficient library funds.

Conclusion :

The changing technology, explosion of information and the changed face of academic libraries from print to electronic have influenced the user behavior. New technology is really helpful for library professionals. In this electronic era social networking sites play an important role to meet the user's requirement within a stipulated time and to provide innovative services to user's doorstep. Social media is boon to the library professionals when it will be implemented wisely otherwise it will be curse also as there are some disadvantages of it. Now its library professionals' turn to use the technology effectively and market the library services to reach to the doorstep of the users.

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ABSTRACT :

Technological environment has placed libraries and information centers (LICs) in a period of constant transition. Changes emerging due to technological developments have forced library managers either to cope with the challenges or manage changes efficiently for survival of both libraries and library professionals. Change is an all pervasive and permanent reality. It is the sign of future growth and a major issue before the library professionals which needs to be addressed positively and effectively. Team work, cooperation, positive and motivational attitude, and robust leadership are few traits to be a successful change manager. Library managers have to recognize the need of change but before initiating the change processes he can follow few pre-change analysis tools to decide whether to go ahead with the change or not. These tools help him to identify the competencies, capabilities and financial competitiveness of library and staff well in advance. This paper attempts to discuss these tools to facilitate better management of proposed changes, services and functioning of libraries to foster information needs of today's technology driven society.

Keywords: Libray, Change Management, SWOT Analysis, Cost Benefit Analysis

1. Introduction

Globalization and Information and Communication Technology (ICT) have influenced working culture drastically. Libraries are also in the phase of transition due to this. Rapid changes are taking place in the libraries and information centers due to constant technological advancements and changing information environment thereof. Thus, managing these changes in the libraries and information centers is the biggest challenge faced by library managers as a change managers and staff as change agents. Technology is the main force behind the changed information environment and users' information needs. To follow these changes library managers has to restructure library infrastructure, services and resources to sustain in the globally competitive world and to fulfill users growing expectations. It is essential for future survival too in an era where google is considered sufficient to search any type of information. Library managers must have to change their traditional ways of operating and serving user community in the present scenario. They need to prepare beforehand for handling change dynamics by analyzing their strengths, weaknesses; opportunities and threats followed by cost benefit analysis to pre-determine their financial competitiveness to deploy change.

2. Change Management

Change management refers to the task of managing changes in an ongoing organization in a systematic manner for the further development of organization as a whole. New challenges such as information explosion, ICT revolution, explosive growth and usage of web resources and dwindling library budgets have called for reorientation, reengineering, transformation and great changes in the information environment, library functions and the roles of library and information service professionals. (Ramana, 2006).

Change management is a structured approach to shifting/transitioning individuals, teams, and organizations from a current state to a desired future state.

It is an organizational process aimed at empowering employees to accept and embrace changes in their current business environment. (Hiatt, n.d.). Change management is defined as the continuous process aligning an organization with its market place... and doing it more responsively and effectively than its competitors. (Kudray and Kleuier, 1997).

The ability to manage change and leading it successfully is a major issue library and information professionals are facing. The key to success lies in the ability to predict, manage, and exploit change in all areas of work, with change management emerging as a key extended skill which must be added to any information professional's repertoire. (Pandya & Pandya, 2010).

2.1 Forces of Change

An organizational change is any alteration of activities in an organization. The alteration of activities may be the result of change in the structure of the organization, transfer of tasks, new product introduction, or changes in attitudes of group members or process, or any number of events inside and outside the organization. (Carson, 1999).

There are various reasons which are forcing libraries and information centers to change:

- Information explosion
- Penetration of technology all over
- Emergence of electronic information environment
- Users' changing information needs
- Globalization of organizations
- Competition in the marketplace
- Declining budgets and funds
- Increasing cost
- Changed information policies

3. Pre-Change Analysis

Various change management models approaches and strategies has been suggested by different authors to manage change. But very few have stated how to know whether a library is ready and capable for the change or not. It requires a thorough understanding of library, its services and users as a whole. When the change is under consideration, a library manager has to assess the strength and weaknesses of his library and its staff before implementing change process. He also needs to assess the financial situation of the library to carry changes further. To decide whether to go with the change or not, library managers can go with pre change analysis tools such as SWOT analysis followed by cost benefit analysis for the successful completion of change management processes.

3.1 SWOT Analysis

SWOT is an abbreviation for **Strengths, Weaknesses, Opportunities and Threats**. It is a powerful tool for exploring the internal and external environment of any organization. It always varies from organization to organization. It analyzes and evaluates the competitive position of an organization.

Strengths and weaknesses can be classified as internal factors whereas opportunities and threats can be classified as external factors. (Figure1). Strengths and opportunities are considered as driving forces and weaknesses and threats are considered as restraining forces in the process of implementing change.

SWOT Analysis is also an important tool for pre-analyzing overall position of libraries and information centers. This way library manger can easily assess the situation to be dealt in future to implement proposed changes.

Figure-1 SWOT Analysis (source: Business Principles and the Role of Information Technology)

3.1.1 Internal factors

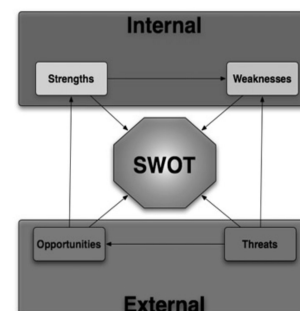
Strengths and weaknesses are internal factors that are present with in the library environment. There are various factors which can be viewed as the strengths and weaknesses in case of libraries and information centers.

3.1.1.1 Strengths

- Availability of adequate information needed to implement change processes
- Qualified and trained staff
- Positive attitude of libray staff towards change
- Participation and involvement of staff during change processes
- Adequate funds for incentives and managing change
- Cooperative attitude of concerned authorities in implementing change
- Flexible infrastructure
- Motivation and support of management

3.1.1.2 Weaknesses:

- Inadequate infrastructure and funds
- Uncertain and unknown fears of change among library staff
- Lack of incentives and benefits of change
- Non-involvement of the library staff in designing the change.
- Lack of ICT trained staff
- Non-participation of library staff in implementing change
- Lack of information/orientation
- Uncooperative attitude of administrative staff
- Lack of trust in management by the staff



3.1.2 External factors

Opportunities and threats are viewed as external factors that are influences by the external environment of the library. The factors that contribute to opportunities and threats in case of libraries and information centers are as follows:

3.1.2.1 Opportunities

- Penetration of technology all over for faster service delivery and functioning of library

- Adequate support and response from the management
- Removal of barriers in funding of libraries
- Positive changes in the government policy related to libraries and information science
- Unfulfilled information needs of the users

3.1.2.2 Threats

- Speed of obsolescence of technology
- Changing expectations of end users
- ICT training of end users and staff
- Speed of information
- Increasing costs of literature
- Changing formats of information
- Increasing dependency of users on internet and Google
- Global competence

The biggest **advantage of SWOT analysis** is that it is simple and only costs time to do and the **disadvantage is that a typical SWOT analysis** is a usually a simple checklist and not critically presented. The **best SWOT analysis** will be more than a simple checklist. It will consider the degree of strength and weakness versus its competitors to determine how good that strength really is. A company may have a strong research and development team but a competitor could be even stronger. A good SWOT should also look the size of an opportunity or threat and show how these inter-relate with its strengths and weaknesses. If a company is thinking about compiling lists it may not be focused sufficiently on how to achieve its objectives. Taking a list approach can also result in items not being prioritized. For example, a long list of weaknesses may appear to be ‘cancelled out’ by a longer list of strengths, regardless of how significant those weaknesses. (<http://www.businessteacher.org.uk/business-operations/swot-analysis/>). Library and Information Centers can also identify, evaluate and compare its strengths, weaknesses, opportunities and threats with other successful organization that have lead change successfully by applying SWOT Matrix. This leads them to manage and implement change more successfully.

3.2 SWOT Matrix

A SWOT matrix is also known as TOWS Matrix. It is a powerful framework for identifying and evaluating strengths and weaknesses as well as the opportunities and threats that library has to deal. (Figure-2)

This helps change managers or leaders of the library and information centers to focus on strengths, minimizing weaknesses, and take the competitive advantage of opportunities available by developing capability to deal threats. It is very useful in strategic planning of dealing change.

- **S-O strategy** lists all the strengths and opportunities libraries have and made the basis for competitive advantage as these are the driving forces of managing change.
- **W-O strategy** can compare opportunities versus weaknesses and can minimize weaknesses by evaluating reasons thereof. Opportunities always favor change.

- **S-T strategy** evaluates strengths against threats that library has to face. Threats can be converted into opportunities by strategic planning.

SWOT Matrix		
	Strengths(S)	Weaknesses (W)
Opportunities (O)	S-O	W-O
Threats (T)	S-T	W-T

Figure-2 SWOT Matrix

• **W-T strategy** lists all the reasons that restrain changes and produce obstacles in the path of success. Threats can be minimized and weaknesses can be remedied.

3.3 Cost Benefit Analysis

Cost Benefit Analysis (CBA) is the best tool to be followed after SWOT

analysis o judge the overall benefits against proposed change to be implemented. It is the most widely used tool to decide whether to go ahead with the change or not. Cost-benefit analysis is a formal analysis of the impacts of a measure or programme, designed to assess whether the advantages (benefits) of the measure or programme are greater than its disadvantages (costs). Cost-benefit analysis is one of a set of formal tools of efficiency assessment. CBA evaluates the overall situation of any organization quantitatively. It simply adds up the value of the benefits of a course of action, and subtracts the costs associated with it. (Hakkert & Wesemann, 2005)

3.3.1 CBA applicability in libraries and information centers

Glen (2010) in their study opines that the recent demand for more accountability from public libraries has made it essential that true cost-benefit analysis be applied to their operations. The difficulty with these statistical appliances is that they measure what libraries do, not the benefits their constituents derive from them. Politicians, taxpayers, and major donors care about how much the public benefits from the resources provided to libraries, not how many volumes circulated during the last month. When it comes to outcomes, all circulations are not equal (e.g., some represent reading; others represent browsing to find something to read). All visitations do not represent equal consumption of services or equal value to the library customer (e.g., stopping by to use the restroom or copier represents a different benefit from that derived by the prospective entrepreneur whom staff help to get the statistics needed to start a new business). The strategic decisions taken by the information scientist/librarian regarding the implementation of ICT is finalized by taking into cost-benefit analysis of various inputs. The information must be managed itself and cost-benefit analysis is the best solution for the using of such information is measured in shape of its cost-benefit analysis. (Jhamb & Pahuja, 2008).

CBA in Libraries and Information centers can be explained with the example given below.

Let's say a library manger is deciding to go ahead with changes related to ICT in the library for the easy accessibility, networking and faster delivery of services. He is taking into consideration various factors like- Library owns few computers and untrained staff etc. At the same time, he is aware that computerization of library is also necessary to meet the demands of technology driven society and it will improve the efficiency of his staff while fulfilling the users' needs. Keeping all these factors under consideration CBA for the library is as under:

3.3.1.1 Costs

- Cost of computer's hardware and software
- Cost of other equipments such as printers, fax, RFID, furniture, etc.

- Cost of training of staff to acquire necessary skills
- Cost of user orientation program to access information using ICT and its tools

3.3.1.2 Benefits

- Building of competencies among staff thereby increasing their professional development
- Ability to sustain in the marketplace
- Improved efficiency and reliability of staff and users
- Improved library user statistics
- Improved customer service and customer relation.
- Enhanced utilization information resources
- Faster service delivery and networking of libraries for resource sharing
- Improved ability to manage library operations

The accuracy of the outcome of a cost–benefit analysis depends on how accurately costs and benefits have been estimated. (wikipedia). After evaluating how much the change will cost to happen, the next step is to calculate the benefits against cost involved. Being a non-profit organization, benefits of library can be calculated in terms of increased services, users' satisfaction which can be further evaluated by carrying out user studies.

4. Conclusion

Change is the law of nature. To sustain in the marketplace each organization and individual has to change. It is also essential for future growth and survival of libraries and library professionals. Libraries that are flexible enough to adopt changes easily always have a competitive edge. Pre-change analysis must be performed to deploy change management processes successfully. As change managers and change leaders it is important for library managers to identify driving and restraining forces that have to be dealt in future. It is helpful in managing change more effectively and efficiently. SWOT and Cost Benefit Analysis, both are powerful pre-change analysis tools in the hands of library managers to lead change successfully. SWOT analysis on one hand helps in recognizing various strengths, weaknesses; opportunities and threats library has whereas Cost Benefit Analysis, on the other hand helps in assessing various funds and finances library has to carry out proposed changes while dealing with the all strengths and weaknesses analyzed beforehand.

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ABSTRACT :

Today's society is a knowledge society where knowledge and information play a very important role for the development of any country. As the development is going on in the fields of science and technology, the new information resources and services are introducing in the libraries. Among these resources digital resources are one of the most important information resource for the libraries. Today most of the users are depending on it and using it in their daily work. Digital resources provide timely information on a topic without any extra efforts. This paper put the light on sources of digital resources, its advantages and resources of it in agriculture universities.

Keywords: Digital Resources, Agriculture Universities, Advantages of Digital Resources.

Introduction :

Libraries have witnessed a great metamorphosis in recent years both in their collection development and in their operations and services. The rapid growth of new technologies has changed the communication process and reduced the cost of communication at individual level. Many new techniques have come in the market that allow easy creation and distributed of information in electronic form. Electronic information sources can be seen as the most recent development in information technology and are among the most powerful tools that are ever invented in human history (Dixit, 1998)¹. Access to e-resources access has a great impact on the information access pattern of agricultural universities libraries. Electronic information resources help to expand access, increase usability and effectiveness and establish new ways for the use of Information and Communication Technology (ICT) has affected the education sector that makes it possible for the researchers in his office to access the full text digital contents of local and distant libraries and databases using computers and the internet in their offices (Agboola, 2003)². The Library is committed to preserving its electronic resources just as permanent access to its collections in other formats. Electronic resources have changed the pattern of communications and information sharing. Students as well have access to this opportunity, though majority access through the commercial cybercafés (Oduwale, 2004)³. With the rapid development of electronic publishing, libraries are not only acquiring reading materials such as printed books and journals but also arranging access to various learning resources in electronic form. That is why, every library is spending major part of its budget on the e-resources. Digital resources are in many formats that the Library collects to support its universal collections. Electronic resources comprise mainly CD-ROM Databases, e-Journals, e-Newspapers, e-Reference Materials, Open Access Journals, e-books etc. There is no doubt that digital resources have revolutionized library services in a variety of ways.

Digital resources came into existence in 1960's with the advent of MARC (Machine Readable Catalogue format). During this period, bibliographic databases also come into market. With the development of WWW (World Wide Web) in 1990s' by Tim Berners Lee, digital resources become available on the web and the use of these resources increased many folds. The e-resources such as e-journals, e-books and full-text databases have emerged as important sources of information. Many libraries have started different services on the web like e- journals, full text databases, web-OPAC, bibliographic and full-text databases, e-books etc for the convince of their users. The technology embrace has led to the proliferation of electronically available information resources. These resources include CD-ROM databases, e-mails, OPAC and internet

browsing (Oduwole et al 2003)⁴. These facilities provide the users with latest and up to date information at their door steps without leaving their place. So, libraries are moving towards the latest technologies and subscribing to the e-resources.

After a decade of rapid technological change, the electronic information resources is now becoming the main medium for disseminating and accessing information from academic literature, and now it is becoming a principal medium for disseminating and accessing information. with advances in ICT, electronic information resources such as e-books, e-journals, CD-ROM databases, OPAC (Online Public Access Catalogue), internet and online databases have launched the world into an information age. no institution or organization can still rely on only traditional printed information resource to perform effectively and efficiently (Quadri, 2012)⁵. The advent of CD-ROM technology has provided opportunities to libraries in the developing world to have access to offline information available from the developed world on CD-ROM databases (Boye, 1996)⁶. However, effective use of CD-ROM technology requires thorough understanding of basic search concepts, such as: Boolean operators and other delimiter features that would expedite the search; the use of librarian to assist the user in enhancing access to the technology (Schultz et al., 2000)⁷. The users' demands, information need and searching skills have changed (Chisenga, 1998⁸ & Oketunji, 2000⁹). Human being has progressed from agricultural revolution to the industrial revolution and now to information revolution. in this revolution, we have certain changes in information field, especially in relation to collection, storing, processing and transmitting of information. information systems have functions to support strategic planning, management control, operations control including improved product quality and delivery (Kroenke, 1989)¹⁰. The changes have resulted into the evolution of libraries into digital libraries. e-resources have affected the functioning of libraries and the information seeking behaviour of users (Tenopir, 2005)¹¹.

Definitions of Digital Resources :

Digital resources are those, which the computer can store, organize, transmit and display without any intervening conversion process. Digital resource needs computer system for accessing the digital information. It includes both print and electrical/digital material. The collection may also include structured/unstructured text, scanned images, graphic audios, video recording etc. At this point, a definition of the term "e-resource" may be helpful. Electronic information resources include that are available and can be accessed electronically through such computer-networked facilities as online library catalogues, the internet and world wide web, digital libraries and archives, government portals and websites, CD-ROM databases, online academic databases such as Medline Online or commercial databases such as LEXIS and NEXIS (Ekwelem, 2009)¹². The Online Dictionary of Library and Information Science defines e-resource as material consisting of data and/or computer program(s) encoded for reading and manipulation by a computer by the use of a peripheral device directly connected to the computer, such as a CD-ROM drive, or remotely via a network, such as the Internet (AACR2). The category includes software applications, electronic texts, bibliographic databases, etc. (Joan)¹³

According to Tsakonass (2006)¹⁴ "Electronic information resources include CD-ROMs and resources available on the internet, such as e-journals, e-prints and other computer-based networks".

According to AI Fadhli (2006)¹⁵ "Electronic publishing in its various forms- e-books, e-journals, databases or hypertext pages, whether online or CD-ROM has transformed the media in which information can be delivered to meet the ever-increased demands of library clientele in the electronic environment".

According to IFLA¹⁶ "Electronic Resources are those materials that require computer access whether through a personal computer, mainframe, or handheld mobile device. They may either be accessed remotely via the internet or locally"

Advantages of Digital Resources :

Time is a major factor for each modern user of the library and digitization is the only solution to the problem. The merit of electronic resources to include access to information that might be restricted to users due to physical location or finances, access to more current information, and the ability to link to additional resources or related content (Dadzie,

2005)¹⁷. Merits of electronic resources over print resources include speed of access, ease of use, ability to search multiple files at the same time, ability to store articles electronically, print and repeat searches, more frequent updating and access to information from outside the library (Brophy, 1993)¹⁸. Convenience, timeliness and the possibilities of searching texts were listed as the most important advantages of electronic resources over print (Lenares, 1999)¹⁹.

Digital libraries are needed to provide quality-based service at the users' doorstep. Digital resources have some special advantages in comparison to the traditional resources.

1. Easy to Understand :

The visual or graphical information system is more popular as compared to text based information system.

2. Shifting of the Environment

The new generation user becomes only happy when they will be able to read from the computer screen.

3. Multiple function of same Information :

In case of digital resources by using hypertext, it is possible to structure and organized the same information in a variety of ways, which serve multiple functions.

4. Information Explosion :

Digital resources are expected to be able to handle the problem of information explosion somehow. It will able to handle and manage large amount of digital content by simply providing link, without procuring the document.

5. Information Retrieval :

By using digital library, one can retrieve any type of information especially for e.g. a particular image, photo, a definition etc.

6. Distance Learning :

Digital resources have reduced the barrier of space and time. Now these can be accessed from anywhere- home, office or other places, which is convenient to the users.

7. To procure Online Publication :

More and more information is going to be published over internet, digital library is needed to procure the online publication and to provide link to important sources of information.

Sources of Digital Resources :

The sources of digital information are those, which the computer can store, organize, transmit and display without any intervening conversion process. It includes both print and electronic or digital material. The collection may also include structured/unstructured text, scanned images, graphic audios, video recording etc. Different digital resources may include e-books, e-journals, e-theses, online databases, CD-ROM databases, E-reports, e-proceedings (Dadzie, 2005; Parameshwar et al. 2009). The following are the sources for Digital information in Agricultural University libraries:

- Online Public Access catalogue. (OPAC) or Web-Based catalogue. (Web -OPAC)
- Databases (Full-text databases, Indexing and abstracting database, reference databases (Biographies, Dictionaries, Directories, Encyclopaedias etc.), Bibliographic Databases, CD-ROM Databases, Web based databases, Numeric and statistical databases).
- E-Journals or e-magazines
- Other E-Learning resources (books, theses/dissertations, maps, images, audio/visual resources, conference

Digital Resources in Agricultural Universities :

Digital resources have many advantages over the print resources of information, therefore, the use of these resources becoming popular in the agricultural universities. These universities store many types of digital resources like e-books, e-journals, Databases, E-theses, E-proceedings, E-reports. ICAR played a major role in the development of digital resources in the field of agriculture by developing “Consortium for e-Resources in Agriculture” and provided centralized subscription to all the agricultural universities in India. The detail of all these digital resources is as follow:

- **E-Books**

E-books are in electronic form that can be accessed and use with the help of computer. It is an electronic form of printed book. First e-book was published in Germany in 1985. E-books are very popular now days because these can be read even on smart phones or tablets etc. These are available in different forms (CD-ROM, online etc.) and formats (PDF, XHTML, CSS, XML). E-books can be purchased from the e-book sellers or can be downloaded free of cost form the Internet.

According to the Oxford Dictionary an e-book may be defined as “An electronic version of a printed book which can be read on a computer or a specifically designed handheld device.”

According to Davis (1997) an e-book is a written work readable on a computer screen, downloaded to a personal computer or digital assistant or placed on a reader designed for that purpose for professionally produced and edited text in an electronic format.

E-books have many advantages over the print books. E-books need less space for storage, can be accessed by number of users at the same time, very economical, easy to carry at any place etc.

Some of the major e-book databases available in field of agriculture science are CRCnet BASE, EBSCO Net Library, Mylibrary, CAB, OvidSP.

- **E-Thesis/ Dissertations**

In digital era theses and dissertations are transformed into digital form. We can also call it as Electronic Thesis and Dissertations (ETD). Now it become mandatory by the UGC, ICAR other bodies to submit the soft copy of theses or dissertation of every student to these bodies and these bodies have created the databases of these published theses or dissertation, so that repetition of the research work don't exist in the future. These databases openly available for the users to consult for their research work.

Some of the major ETDs available that caters to academic and scientific community:

Shodganga of INFLIBNET, Krishiprabha/E-Prabha, E-quest

- **Databases**

Database is a collection of digitized information that that may contain bibliographic records, directory entries, abstracts, full text documents, statistics, images etc and these are concern to a subject and regularly updates. Databases may be of books, theses, newspapers, reports etc. Databases provide very easy and timely access to any information. These are available on-line or in the form of CD-ROM/DVD-ROM.

Feather has defined databases into six categories: Bibliographic database, Full-text database, Directory database, Numeric databases, Multimedia databases and Transactional databases (Feather et. al. 2003).

There are number of databases in the subject of agriculture and related disciplines:

- AGRICOLA through EBSCO
- AGRIS through FAO
- Biosis Previews through Thomson Reuters
- FSTA through EBSCO
- MEDLINE through US National Library of Medicine
- Forestry Database in CD-ROM (Project database)
- NUCSSI through Niccair
- FAOSTAT (World Wide statistical Information) through FAO
- Commodities Database (Statistical Information on agriculture commodities)
- Indiatat.com (Statistical Information)
- ISO standards on Food Products
- CAB Abstract through EBSCO
- AgriCat (Union Catalogue of 12 Major Libraries of ICAR Institutions and SAS combined together).

• E-Journals

E-journals are one of the important forms of e-resources as these are very useful in scholarly communications. E-journals can be accessed by multiple users at the same time.

The e-journals are proving very beneficial and are being well liked tool for the research community of every university for seeking their desired information.

E-journals have been in existence for last few decades. Initially, they were made available on CD-ROMs, but later a large number of universities started downloading articles of e-journals from the Internet. Today a variety of E-journals are available on the internet and these are not bought like traditional ones.

There is no one universally accepted definition of e-journal. Some people call it paperless journal, or virtual journal and many others online journal, etc. It would be better to consider first the definition of a journal here before explaining anything about e-journal.

According to ALA Glossary, 1983 “a journal is a periodical especially one containing scholarly article and/or disseminating current information on research and development in a particular subject field. If this task is done by electronic media then it may call e-journal. If the content of journal produced, stored and scanned in a database and then retrieved online then same is called online journal.”

According to Prytherch “A journal which is available in electronic format, a physical, printed version may also be available.”

According to Reitz “A digital version of a print journal, or a journal-like electronic publication with no print counterpart, made available via the Web, e-mail, or other means of Internet access.”

So, we can define e-journals as those periodicals which are produced, published and distributed electronically and their print forms may or may not be available. Some people are of the view that digital versions of print journals are also included in e-journals.

• E- Journals through Consortia

Now a day most of the journals are available in e-forms. As the trend of e-journals format has been began many new ways started for the access of e-journals. Now every library can subscribe e-journals from the prescribed publishers.

A new form of journals has been started that is e-journals' Consortium. In consortium, many e-journal packages are made available to the libraries at a very low rate. The consortia are very useful because consortia make it possible to share resources amongst many libraries at the same time. On the other hand, we can get faster and easy access of e-journals. Now there is different consortium available in the market related to the different subjects. In the field of agriculture there is very much familiar and useful consortium available that is CeRa. There are many other consortia like IGCAR Consortium, IIMs Consortium, and FORSA Consortium.

- Consortium for e-Resources in Agriculture (CeRA)

CeRA covers the journals related to agriculture as well as allied fields. Accessibility of CeRA provided to the scientists as well as researchers of National Agricultural Research System (NARS) through internet connectivity. It was established by Indian Agricultural Research Institute (IARI) in November 2007 by getting financial assistance from the National Agricultural Innovation Project (NAIP). It was started on 30th April 2008 with the object to provide e-resources to the scientists and teachers at the ICAR institutions or SAUs and to develop Science Citation Index (SCI) at IARI and at last to measure the impact of CeRA on the scientific publication. At the first step, the access of CeRA was given to the limited institutions (124) only. At the first stage, it was started with the three years of agreement with the financial assistance from the centre government and covered the journals of Springer, Science Direct, J-Gate, Annual Review and CSIRO etc. At present, it covers the following publishers and e-journals and providing access to 130 institutions*.

Table 1

Electronic Resources through CeRA

S.No.	Publisher	No. of Journals
1	Taylor & Francis	1227
2	Science Direct	419
3	Indian Journals	196
4	Bio One	171
5	Springer	71
6	Oxford Uni. Press	30
7	Annual Review	25
8	ASM	13
9	IWA	12
10	CSIRO	8
11	American Society of Agronomy	6
12	AAAS	2
13	CABI	1
14	ISHS	1
	Total	2182

CeRA covers total 2182 e-journals under the consortium. These journals are subscribed from the reputed publishers and covers different subject areas related to agriculture sciences.

Table 2

Member Bodies of CeRA

S.No.	Member Bodies	Number
1	Deemed Universities	4
2	ICAR Headquarter and KAB	1
3	Institutions	45
4	National Bureaux	6
5	Directorates/Project Directorates	20
6	National Research Centre	13
7	Universities	41
	Total	130

Conclusion :

As we can see that there are lots of digital resources available in the libraries related to agriculture field. These resources play a very crucial role in the development of agriculture as well as education. Digital resources have many advantages over the print resources as these can be accessed by multiple users at the same time, very economical, easy to search and use, environmental friendly etc. So, these are becoming popular in the academic libraries. On the other hand these are very easy to store without any restriction of space and need not to spend on any infrastructure like building, book stacks etc. So, libraries are also motivating to the library users towards the use of these resources.

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ABSTRACT :

The right career advice can help a person to choose a career to suit individual personality as well as his aspirations. College libraries can contribute much towards providing career information services. Web 2.0 is the best medium to interact with youth and to know their changing expectations from academic libraries. The present case study of Asmita college library highlights the role played by the library in career guidance activities through the use of a blog to provide innovative career information services.

Keywords: Career Blog, Web 2.0, College Libraries, Innovative Practices, Career Information Services

Introduction :

Libraries serve an important role in society – to help people orientate in our modern information society. If people read and seek information, the culture will live on. The purpose of libraries is to help people be informed and thereby better able to manage in their lives. College libraries mainly serve youth. Such youth community needs skills like the ability to communicate and get along with people and the ability to think ahead besides acquiring academic qualifications. The twenty firsts century dawned with major transformations in the structure of work and careers and the job market. In an academic institution, the library is the focal point where staff and students are energized and empowered with knowledge. Libraries ought to extend their support in all spheres of knowledge and by providing career information in the library it will be helping the users to have an aim in their lives. It is necessary to provide career information literacy to the graduates so that they will be equipped with the knowledge about how to seek, evaluate and select career information and this may lead to better decision making for the quality of their future life.

The right career advice can help a person to choose a career to suit individual personality as well as his aspirations. While doing career search it is imperative to have the correct career information. According to Sinz “It is extremely important for colleges to offer career guidance aimed to help students make more informed and consequently better educational and career choices.” College libraries can contribute much towards the career guidance programs as the library is in a unique position to collect, organize, retrieve and disseminate career information material to users.

The advent of the internet has not only revolutionized the way academic libraries collect and disseminate information but also redefine Users expectations from the libraries to change the way of providing library services. Web 2.0 is the best medium to interact with youth and to know their changing expectations from academic libraries. The present case study of Asmita college library highlights the role played by the library in career guidance activities using web 2.0 tool. Asmita College is a women’s college of arts and commerce faculty till graduation. Asmita college library started providing career information services from the year 2010.

Review of Literature :

The blog has already enjoyed a short but successful history in education. It has been heralded as a transformational tool for teaching and learning (Anderson & Kanuka; Williams & Jacobs, 2004) and as a disruptive technology (Kop, 2007).

Blogs have been used for a variety of purposes in teacher education, as a means of generating elements of work-based electronic portfolios (Chuang, 2008), and as a way of promoting peer support and peer learning (Hall & Davison, 2007). Their use has been evaluated favourably across a diverse range of educational settings, including clinical education (Kamel Boulos, Maramba, & Wheeler, 2006), postsecondary education (Leslie & Murphy, 2008), higher education in general (Lankshear & Knobel, 2006) and in more informal learning settings (Stefanone & Jang, 2008). As an evolving form of social software, the functionality of the blog has gradually extended beyond simple online reflective diaries, offering readers the opportunity to interact with the writer through the posting of comments directly to the blog within a likeminded community (Luehmann & Tinelli, 2008). Blogs also have an archive feature where a history of posts is presented in reverse chronology, providing users access to a complete record of what has gone before. The hypertextual dimension of the blog should not go unmentioned. The ability to embed hyperlinks, hypermedia (such as video and audio), and images into the blog also serves to enrich the content generation options of the writer. Although blogs are generally used to reflect personal opinions, they have communication with others at the centre of their purpose (Kop, 2007) and are therefore potentially powerful dialogic tools. They promote learning through collaboration, and the sharing of knowledge and best practice (Hramiak, Boulton, & Irwin, 2009; Ojala, 2005). Finally, blogs encourage deep and continuous learning through regular reflection and through knowledge management (O'Donnell, 2006). Reflective journal writing and peer feedback, both of which are achievable through blogging, may also enable teachers to detect barriers to good practice. Reflective writing helps them to change their teaching beliefs and so implement strategies that promote transformative teaching (Sockman & Sharma, 2008). Thus, reflection on practice can make change possible, and provides practitioners with the information required to “develop guidelines for setting new needs, goals, and plans” (Yang, 2009, p. 11). Several criticisms have been levelled against blogging as a learning tool, but in comparison to the benefits that are cited these could be considered significantly lower in magnitude. Kerr (2006), for example, suggests that reverse chronological ordering of entries can run counter to good scholarship. Berman (2006) warns that blogging can become obsessive and addictive for some students, distracting them from the real business of study, while Smith (2006) argues that the brevity of most blog posts precludes any real academic value from being found in their content. From an examination of the preceding review, such objections may appear trivial, and it appears that the benefits of blogging for student teachers outweigh any disadvantages that may be perceived. By far the most serious problem would seem to be the loss of interest and impetus experienced by many bloggers who start off with good intentions of posting regular entries, but whose enthusiasm tails off after a short while (Kamel Boulos et al., 2006). Wolf (2010) reviews the effectiveness of blogs within the context of a compulsory final year placement unit for public relations students. The results of the study the results indicated that the introduction of the Reflective Blog was a successful, particularly in the context of an individual tuition unit, by effectively shifting the focus away from textbook and teacher centric education, to interactive peer to peer learning opportunities.

Methodology:

Design thinking is an approach or a mindset which can help us to solve everyday challenges at the library. In case of Asmita College library, we thought about the innovative practices which can be evolved and adopted by the library to provide ground-breaking career information services. The steps we had taken to solve our problem and to provide innovative services unexpectedly fall under design thinking approach.

While planning we thought more about the blog design and how we can make it better on the next iteration. The problem was mostly with executing an image design that will work on all devices and screen resolutions. After several times experimentation, we solved the issue with imagery by fixing a 4:2 ratio and keep the ratio consistent as it scales from the smallest mobile @media width up to the largest. At the largest resolution sizes, the image height could possibly push the title below the fold but that will be only 1% of the population. It's best to provide the best viewing experience for 99% of the population than to appease the 1%. This would allow us to move the image back above the title and provide a much

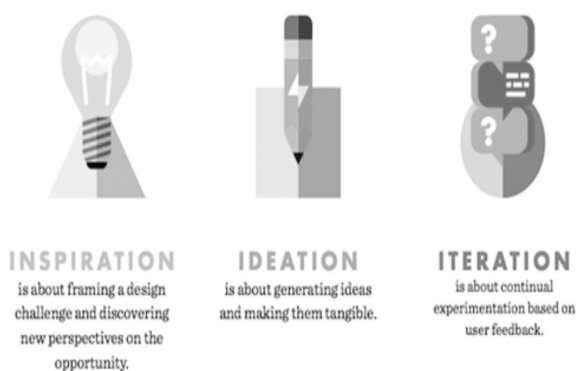
better and more visually appealing experience for the reader.

In case of layout of the blog magazine formats give more emphasis to images, separating individual posts or categories and highlighting interactions, but risk turning a blog into, well, a magazine. In contrast, journal layouts highlight the most recent content and present a more momentous mood. While designing layout of the blog we decided to use the journal layout format.

The quality of the content matters, how frequently you post and update that content is vitally important, too. Balancing the relationship between quality and frequency is critical. After a brainstorming session, we decided to up-date our blog at least monthly to keep it live and active.

Design Thinking is an innovation methodology –a set of principles, tools and a process for innovating. What’s really cool about design, among so many things, are the principles that underpin it – Customer Centricity, Empathy, Curiosity. Design Thinking unleashes creativity in us – it calls upon us to connect deeply with others- our customers- so that we are compelled to create something that will amaze our viewers of blog.

Design Thinking approach mainly focuses on Inspiration, Ideation, and Iteration.



Inspiration :

Many students were used to visiting the library to acquire career information. Librarian used to provide personal guidance to them about different career alternatives available for them and used to inform them about different competitive examinations and campus placement events organized on the college campus. But it was very difficult to be in touch with students regularly on a personal level to inform them about all the events and schedules of competitive examinations and campus placement events. To communicate with a pass out students was much more difficult until the year 2014.

Till 2014 we were providing the career associated information only through the library notice board. Students were used to visiting the library to know about the upcoming career events and schedules of upcoming competitive examinations. It was very difficult for the pass out students to visit the library frequently. We, as a library staff members were thinking about how to approach all the students to provide career-related information.

Following were several questions which described our challenge or objectives:

How might we can approach students immediately to inform them about current activities and notifications regarding career events?

How might we can inform students about schedules of upcoming competitive examinations and career events in the college?

How might we can provide career information service cost effectively?

How might we can approach pass out students to facilitate career information service?

Ideation :

Three members were selected as a group to have a brainstorming session to think about innovative practices to provide career information services. SWOT analysis revealed the following points;

Strengths:

- a) Students eagerness to know different career alternatives.

Opportunities:

- a) Youth's preference for social media.
- b) One of the best things about blogs is that many blogging programs are either free or inexpensive to use.

Weaknesses:

- a) Difficult to organize grooming sessions frequently regarding career awareness during regular lecture schedules.
- b) Difficult to organize grooming sessions for entire student's population together.
- c) Difficult to approach pass out students.

Threats:

- a) Limited budget allocation.
- b) Every notification can't be published on college website as the institutional website is static.

Different ideas were generated through the brainstorming session. All the ideas were jotted down on paper. Through this brainstorming session, an idea of creating a career blog was put forth which was finally accepted by all the three members of the group. Following are the reasons behind accepting an idea of creating a career blog:

- 1) Social media more preferred by the young generation.
- 2) Preparing a blog as a social media tool will be cost effective.
- 3) Users can access this blog anytime from remote places.
- 4) We were able to approach and communicate with all our students including pass out students through this blog.
- 5) Updating of the blog is quite simple.

Iteration :

Asmita College career blog provides following services.

- A) Updating of monthly Job recruitments:** We provide updates of Job recruitments monthly through the career blog.



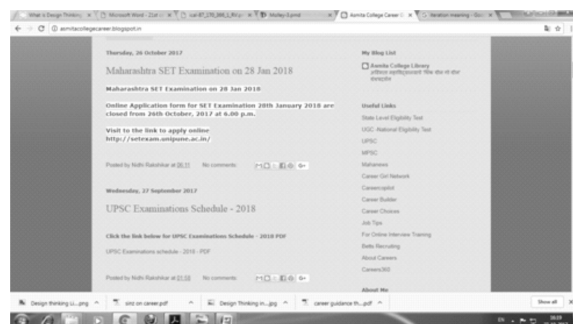
The information for this is collected from other sites including government websites and organized together on monthly basis.

- B) Alerts and Schedules for different competitive examinations:** We publish alerts and schedules of different competitive examinations to update our students about



the schedules of upcoming competitive examinations on the home page of our blog.

- C) Descriptive information about competitive examinations:** We publish detail information about different competitive examinations such as TOFEL, NET/SET, CAT, GRE, etc. These pages inform about nature of examinations, paper pattern, eligibility criteria, etc.



- D) Useful links:** Career-related website links are available on the blog for a quick visit.

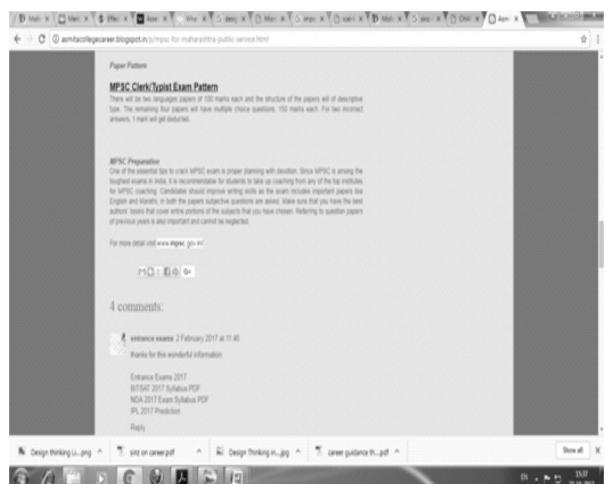
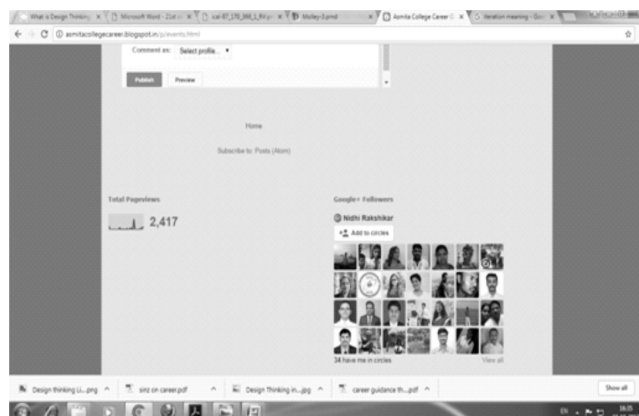


- E) Informative PPT's:** We are adding informative PPT's on our blog to increase awareness the students about different emerging career alternatives available for them.

- F) Intimation about career events organized at College campus:** We provide information about different upcoming career events organized at College campus and publish the reports after such events.

- G) Page views statistics:** As librarians, we need the statistics

of the visitors. Blogs provide the facility to highlight the total pageviews which is useful for librarians for maintenance of



statistics as well as useful for users to rely on the blog regarding the authenticity of information.

Comments: We can receive comments and feedback from our users through the blog. These comments work as feedback to continuously evolve and improve for future innovations.

Conclusion :

Librarians have long used a variety of means for getting information about the library out to our communities – newsletters, alerts, emails, posters and flyers and more.

Using a blog offers the opportunity to innovate your communications. Blogging not only gives you a way to push information out but also to gather feedback and build a community without having the very much technical know-how. Librarians have had to learn how to do a lot with just a little in order to promote awareness of their programs and services. They have seized the opportunities to market libraries in the real world via traditional media: newspapers, corporate newsletters, radio, and TV. Many libraries produce brochures, pathfinders, and their own newsletters. So, it is no surprise to see librarians stepping up to the plate and spreading the word online with blogs. Savvy librarians have identified blogs as another means to market libraries and their services. Promoting your library's services, resources, and programs online can be a lot easier with the help of a blog. A great library blog requires three ingredients: inspiration, motivation, and dedication. Inspiration is that moment when your new marketing idea meshes perfectly with a blog as the delivery vehicle. Motivation is the energy to put good ideas into practice and helps launch the new blog. Dedication is what comes next. It's the hard work that keeps the blog updated with pithy, lively posts on a constant basis. Thus, blogs can be very effective tools for reaching online audiences.

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ABSTRACT :

In this era of digitization, libraries are also updating their collection in print as well as in e form for e.g. E Books, E databases, E Journals etc. But the effective utilization of these E resources is major challenge for information professionals. Design thinking approach has the potential to improve problem definition and provide mechanism to give solution. So in this paper thrown focus on the application of design thinking methods to promote effective use of E resources. In this article the example or problem selected is at very basic level, for the better understanding of design thinking concept.

Keywords : Design Thinking, E-resources, Libraries, Empathize

1. Introduction :

The library is a place for community learning and growth. It is a vital to the persistence of libraries through the digital age. With the advancement of ICT the way users' access materials and the materials they are accessing may be changing and have changed significantly in the past three decades, the structure of a library, physically and socially, has been able to move to meet the needs of their communities. However, libraries should not only bend and move to fit the digital age; they should find a way to succeed within it. This can be done once the focus is predetermined to place emphasis on the role of a library in the community as a "place" that is central to the community. It is a goal that can be readily achieved in a manner of ways, from content availability, to function, to physical structure.

Library is no more limited to print product as it is add all e forms in it. Many libraries subscribing e databases, e journals, e books etc. for their library user. Libraries are also arranging many induction programmes, training workshop and seminar to provide guidelines for their user. Still it is observed that the use of e resources is not up to the mark not even the average scale.

Institution is spending the large amount of money for the subscription so they are facing this issue as a challenge for the librarianship. So, with the help of the Design thinking approach may find the solution for the concern area.

2. Objectives of the Present Study :

The objectives of the study are as follows:

1. To understand the meaning and importance and steps of design thinking.
2. To provide application of Design Thinking Approach to libraries with reference for effective usage of E resources.

3. Methodology :

The questionnaire method was used for the data collection, for the concern study.

4. The Nature and Demand of Design Thinking :

The design of any products and services is a critical factor of business competitiveness or effectiveness. But beyond

product and service design, however, design thinking—approaching management problems as designer’s approach design problems—may have important implications for management, an emerging prospect that has begun to gain acknowledged in both academic literature and the business press. Design is highly complex and sophisticated skill. It is not the mystical ability given only to those with recondite.

According to Matchett (1968) who define design is “the optimum solution to the true needs of a particular set of circumstances”. This definition suggest at least two ways in which design situation can very Matchett’s use of optimum indicates that result of design as he knows it can be measured against established criteria of success. Matchett’s definition also assumes that all the true needs of circumstances can be listed.

According to Curis Jones (1970) gives what he regarded as an ultimate definition of design “to initiate change in man made things”.

Merriam Webster Dictionary defines ‘Thinking as the action of using one’s mind to produce thoughts’.

So, we can say that Design Thinking is creative though process to provide module solution to the concern problems.

5. Literature Review:

The origins of design thinking lie in Simon’s (1969) *The Sciences of the Artificial*. Simon observed that ‘the intellectual activity that produces material artefacts is no different fundamentally from the one that prescribes remedies for a sick patient . . . or a social welfare policy for a state’ (p. 55–56). The ability to iterate, test, and incrementally improve designs is central to Simon’s model and is the ‘core of all professional training; it is the principal mark that distinguishes the professions from the sciences’. Simon subsequently extended his design focus to social planning. For him, such planning ideally aimed to help decision makers ‘evaluate alternatives better’ and ‘experience the world in more and richer ways’ (1996:130).

Design thinking emphasises the importance of problem definition. The inclusion of citizen or ‘end-user’ perspectives in problem definition is said to enable a richer understanding of the problem and direct attention to more nuanced solutions (Fung 2006).

Design thinking is generally defined as an analytic and creative process that engages a person in opportunities to experiment, create and prototype models, gather feedback, and redesign. It is a very compendium phenomenon. So, it has also started to receive increased attention in business settings. This is because the design of products and services is a major component of business competitiveness, to the extent that many known companies have committed themselves to becoming design leaders (Dunne & Martin, 2006). And although design thinking has become an integral part of the design and engineering fields as well as business, it can also have a positive influence on 21st century education across disciplines because it involves creative thinking in generating solutions for problems. That is, in academic environments, students are required to read critically, think and reason logically, and solve complex problems (Rotherham & Willingham, 2009). Thus, to help students succeed in this interconnected, digital world we live in, educators should support students in developing and honing 21st century skills (e.g., design thinking, systems thinking, and teamwork skills) that enhance their problem-solving skills and prepare them for college and career (Rotherham & Willingham, 2009; Shute & Torres, 2012).

Design thinking emphasises the importance of problem definition. The inclusion of citizen or ‘end-user’ perspectives in problem definition is said to enable a richer understanding of the problem and direct attention to more nuanced solutions (Fung 2006).

6. Process of Design Thinking :

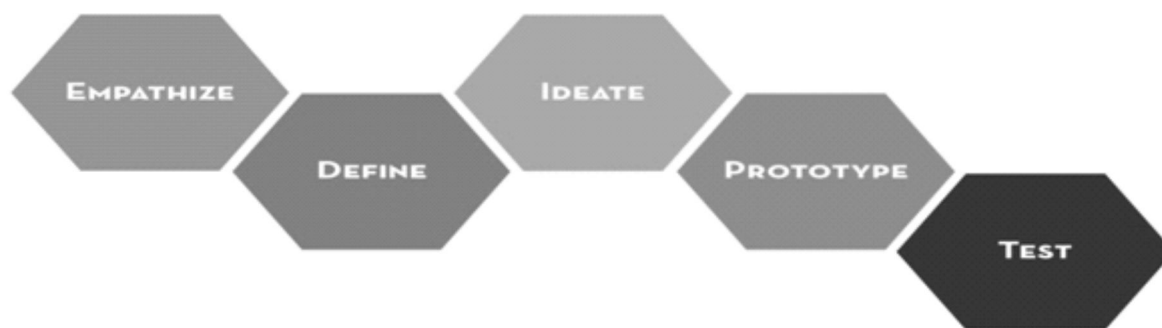


Figure .1.

As Shown in above In Figure I, **Design Thinking process** is a combination of five steps that is:-

1. Empathize,
2. Define,
3. Ideate,
4. Prototype,
5. Test.

The sequence of these steps can be modified according to need of the problem solution. The process can be understood with the help of following Diagram.

6. Utilization of E resources :

Electronic resources are most valuable research tools which supplement print-based resources in any traditional library. Electronic resources provide access to information that might be restricted to the user because of geographical location or finances. They also provide access to current information as these are often updated frequently. Through their various search techniques, electronic resources provide extensive links to explore additional resources or related content. In addition, electronic resources are convenient to use since users can access information from the library, cybercafé, offices or at times from the comfort of their homes at any time of the day. So, efficient utilization of these e resources is a primary concern factor for all the library professionals.

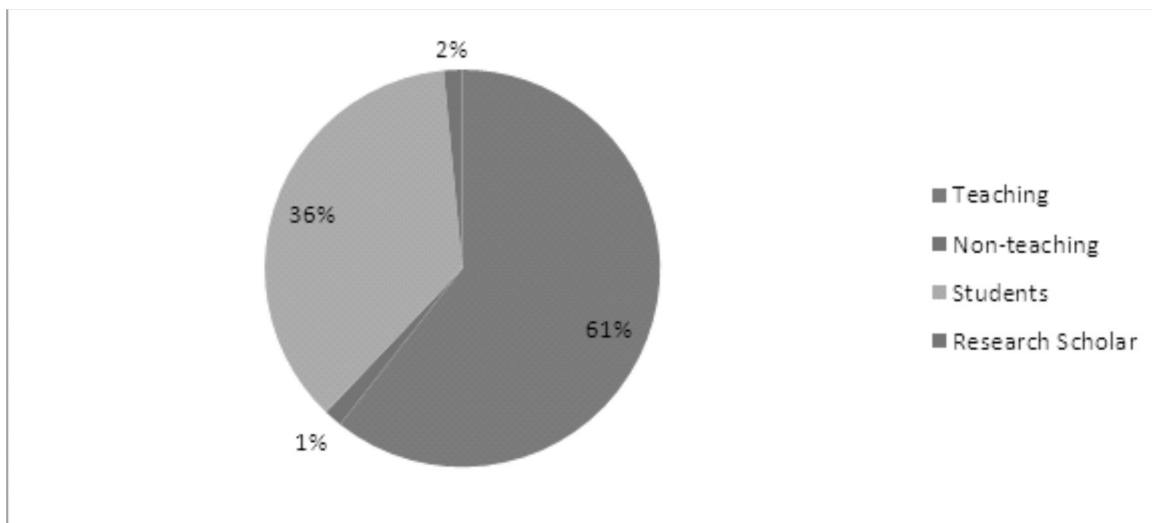
7. Data Collection and Findings :

For this study, we took one academic library as a sample. This sample library is facing an issue of low or no use of e resources. The sample library has a subscription of e databases, e books, institutional repository etc. The students, teachers, nonteaching staff and research scholars are the customer of the sample library. A total of ninety questionnaires were personally, distributed to each respondent out of sixty-six responded to our questionnaires with a responded rate of 73.33%. The data was presented in graphic format for analysis and interpretation.

7.1 Study of the Population: Category wise :

Figure II shows that category wise distribution of respondent. Teaching category has respondent more than 61% followed by Student that is 36%.

Figure: II Category Wise Distribution of Respondent



7.2 Study of the Population: Department Wise

Figure III: indicates the department wise respondent study. The percentage of Commerce, management, and IT departments are 35%, 29% and 36% respectively.

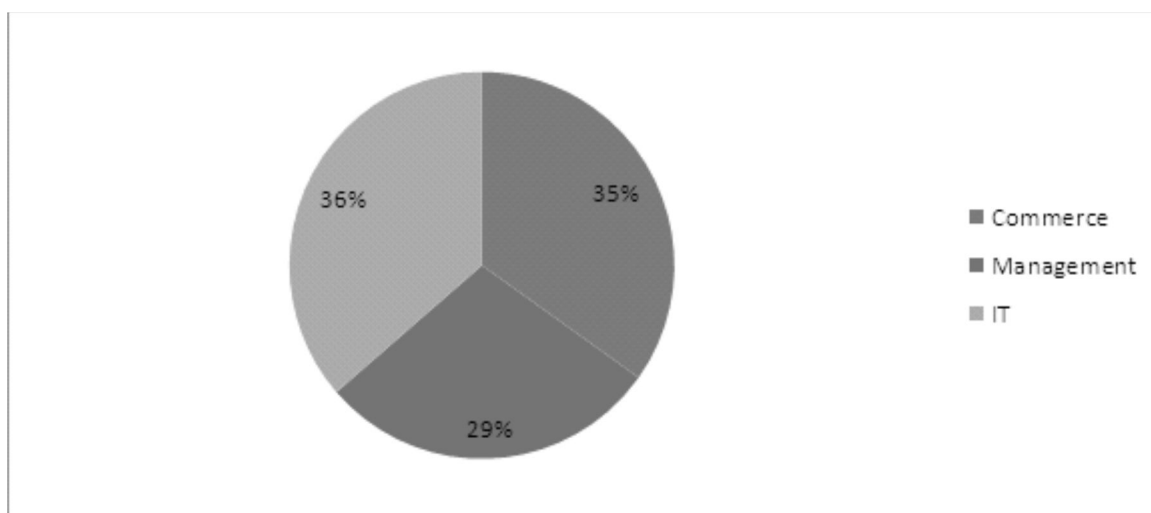


Figure: III Department Wise Distribution of Respondent

7.3 Study of the Population: Gender Wise

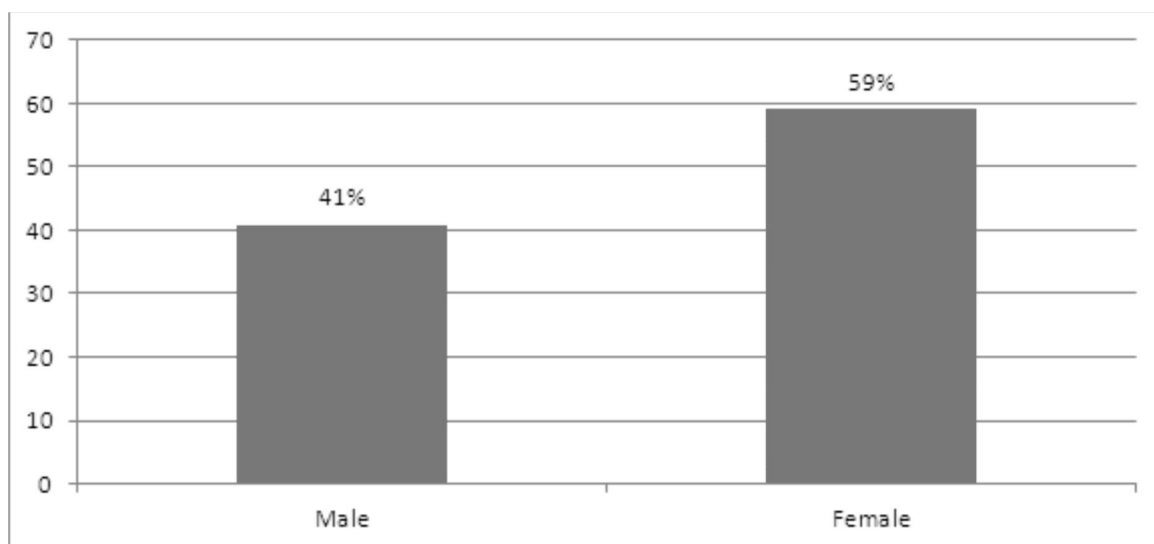
Figure- IV shows the gender wise distribution of respondents. More than fifty percentage of respondent are female (59%) and male respondent constitute (41%). Thus, the study population is female dominant

Figure IV - Gender Wise Distribution of Respondents

7.4 Frequency uses of E-resources :

Figure V: (38%) respondent uses e- resources on daily basis followed by twice in a week (27%). Weekly it is (15%), monthly (8%) and occasionally (11%).

Figure V. Frequency uses of E-resources



7.5 Source to learn E- resources Searching Skills:

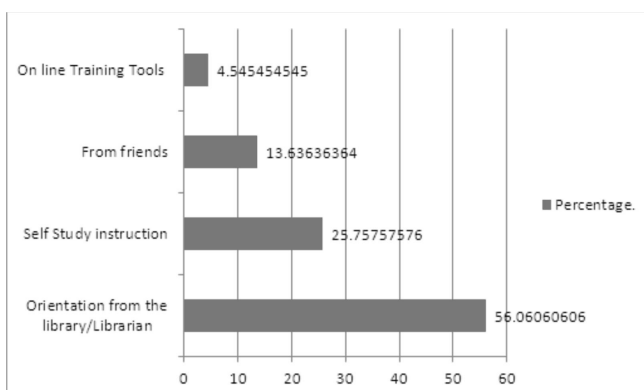
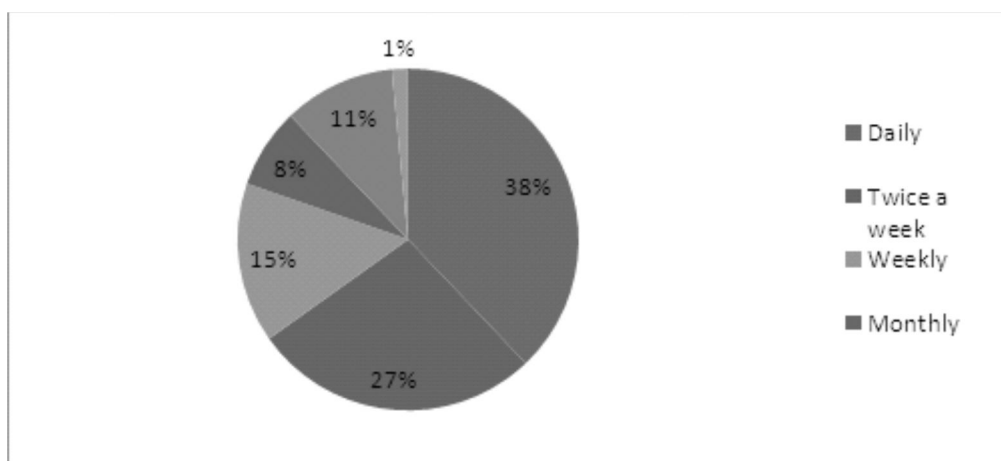


Figure-VI shows the source of skill developing for searching E- Resources. Library Orientation (56.06%) is the major source of skill developing for searching. Self-study instruction (25.75%) followed by, from friends (13.63%) and online learning tools (4.5%), thus this finding represents the orientation of library is the major source for developing searching of E- Resource skill.

Figure-VI Source to learn E- resources searching skills

7.6 Often Used Key Terms to Find Desired E-resources:

Figure -VII shows the finding of uses of different Key terms for accessing E- Resources. Use of Subject (75.75%) dominates followed keywords (71.21%). (57.57) % respondent access E- resources by using Author

and title of the article, (28.78%) respondent search by using Journal title. According to findings year of publication and table of content (3%) has less in use for finding desired e resources. Thus for accessing E-Resources respondent used subject most.

7.7

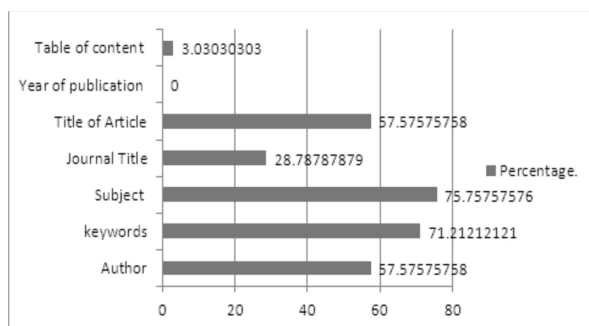


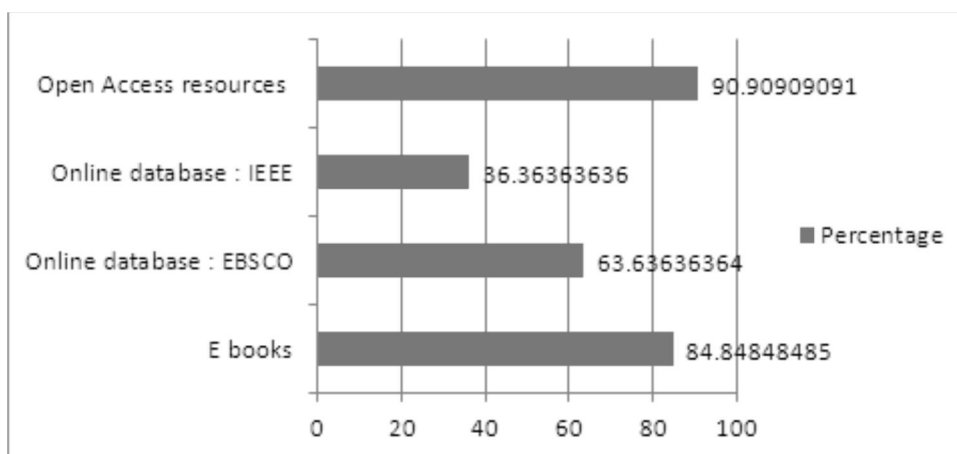
Figure –VII Use of Key terms for find desired e resource

Most type of used E resources:

Figure -VIII show the different types of E – Resources and its use by respondent, among the all form of E resources, 90.90% respondent uses open access resources followed by 84.84 % respondent uses E books. Online database EBSCO and IEEE is used by respondent 63.63% and 36.36% respectively. The use of IEEE database comparatively less and Open Access resources are most in used.

Figure –VIII Most type of used E- resources.

7.8



Prefer form for learning resources.

Figure –IX represents the findings on the preference of respondent towards the use of electronic medium of study material, print study material or both.

54% of respondent prefer to use combination of electronic and print form of learning resources where as 32% prefer to use electronic learning resources and 14% for printing. Thus, combination of both the form of learning resources is adopted by the respondent.

Figure – IX Prefer form for learning resources

7.9 Use Medium for Utilization of E-resources

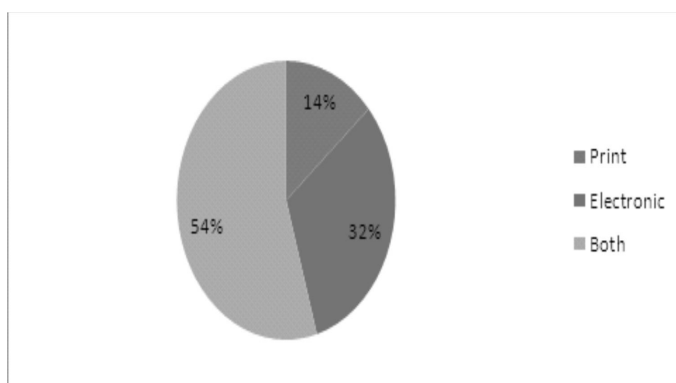


Figure –X shows different means applied by respondent for using E-resources out of four medium downloaded in storage devices used by the highest number of respondent (44%) along with (23.33%) respondent uses E- resource by making print out; (13%) respondent uses computer screen and 20% responded are used all the above methods. Thus, the majority of respondent are

used the downloaded and storage medium for using E- Resources

Figure –X Medium for utilization of e-resources

7.10 Purpose for using e – resources:

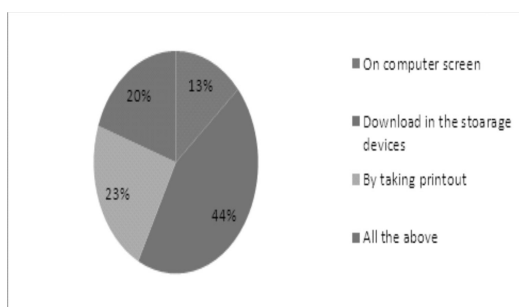


Figure –XI represents the major reasons for which respondent uses E resources. Top three reason represent by majority of respondent are for writing papers (90.90%) research (63.63%), 54% used it for update the knowledge. 43% respondent used it for learning and 34% of it use for current information.

Figure –XI Purposes for using e – resources:

7.11 Time Period:

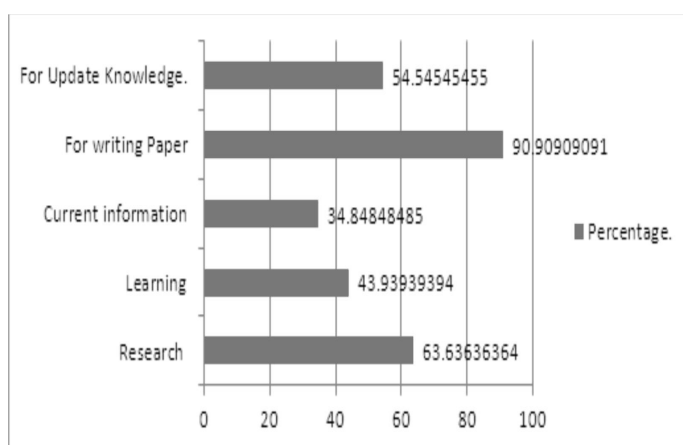


Figure –XII find out the amount of daily time spend by the Respondent for using E- resources. According to this figure more than 54% respondent uses up to one hour, 21% uses less than one hour .17% Two hour for searching E-resources followed by more than three hours that 8%. Thus, majority of respondent are (54%) uses, up to one hour for the searching E- resources.

Figure –XII Time Period.

7.12 Difficulties while using e resources:

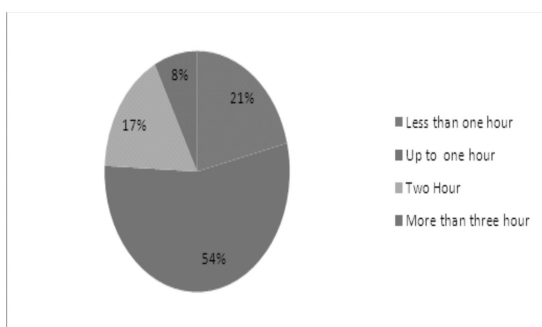
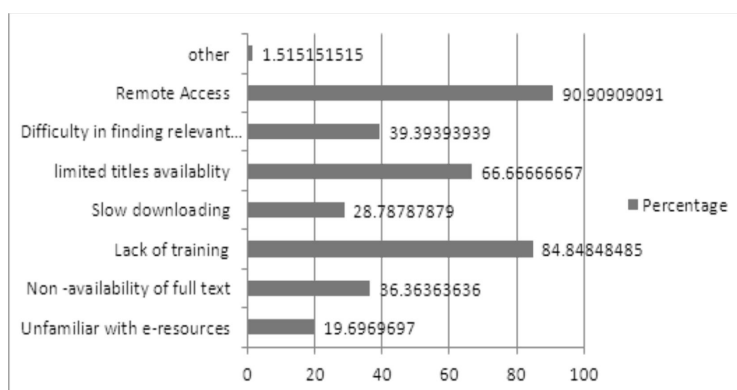


Figure – XIII displays different obstacles faced by the respondent while using the E- Resources. 90% of respondent cited remote access availability followed by 84% of people complaining about lack of training and only limited titles available are obstacle in third position 66% of people referred only limited title as major obstacle for accessing E- resources thus remote access availability, Non availability of full text, limited titles and lack of training are prime obstacle to access E- Resources

Figure XIII Difficulties while using e resources

7.13 Suggestion: -

Respondents provided following type of suggestion like regular update of new information in concern subject; more subscriptions from well-known professional bodies; requirement of training session etc.



8. Steps of Actions after Data Finding:

According to study, it is important to follow systematic approach for effective utilization of resources by keeping the interest of the respondent at prime level. For that we plan to adopt Design thinking method to the concern challenge area

9. Application of design thinking for effective use of E-resources:

We adapted the design-thinking approach, to suit an academic library with reference to expand use of e resources. The process of design thinking with the case study is explained below:

9.1 Empathy :

Empathize means learn about the audience to whom we are designing. The different tools can be used for the same that are observation, questionnaire, interview etc.

To understand the needs of our users that are students, staff and research scholar etc. we prepare a questionnaire and took interview of subject coordinators. This approach provided us with rich appropriate information and a more insightful understanding of the library user experience than any other tools.

9.2 Definition :

In this stage, we need to create a point of view that is based on the user needs and insight.

The information we gained from the empathetic approach, above, was helped to define the problems we found that were related to use of e resources. We also identified obstacles in the way of smooth access of available e resources. The problems are technical difficulties, lack of database knowledge, reluctant to use etc. So, the least use or we can no use as a big challenge for the sample library.

9.3 Ideation :

In the Ideate phase we need to find idea or creative solution to the concern problem with the help of group discussion & brainstorm session.

Based on problem definition above, library staff with the committee members were engaged in brainstorming sessions. This group consist of library staff, library committee members, subject coordinators, students' coordinators etc. That kind brainstorming session leads to not only fun in terms of group interconnection, but also resulted in several non-traditional useful ideas.

These brainstorming sessions also involved some library student co coordinators, who offered a valuable student perspective with a lot of spontaneous humour from their own experiences. The resulting solutions we arrived at had a conversational tone to them. Library staff members and subject coordinators were talk about the demanding topic and project related use of online resources. Library committee member were throw light on marketing and orientation programme. We decided to prototype the more applicable ideas for testing, as it was in line with our vision for the library being seen as less authoritarian and prescriptive. We also work on the confusing factors with respect to e resource use.

9.4 Prototyping :

Prototype can be considered as a rough draft of task. With the help of brainstorm session one need to finalise the working flow of the finding solution. It is actual application of the finding solution. It is a application of ideas to the small group or community according to the need of the circumstances.

We prototyped a range of ideas for testing purpose.

- First, we identify non-user group of e resources among staff, students and research scholars.
- Marketing and orientation planning program was set for the selected groups according to their need. E resource access and search tutorial videos were prepared and circulate among the groups. Special training session was arranged on search technique according to users' area of interest.
- Indexing and abstracting service was introduced at prior level as per the group demand. It helps them to search the related topic in a better way.
- Introduction of new Quiz model for the students and staff i. e. called as '*Kun Banega Smart Surfer*'? This helped to motivate the student to take part in the process very actively. Where we ask the user to review the authentic literature in consent subject with short period of time.

This made the process more manageable, and, over time, helped us create awareness among that worked for all our users.

9.5 Testing:

In testing phase, there is an actual implementation of ideas and collection of feedback from desired group of customers. Testing help to identify loopholes in the process and help to find out measures to remove it.

We simultaneously engaged in a process of prototyping and testing that informed each other in a continuous process. Once there was enough user involvement it helped us to decide on which session or on activity we need to work for improvisation. Training part and quiz part find motivation booster for the effective use. So, we proceeded to make more informative and communicative information literacy programme.

Conclusion :

Design thinking has become an integral part of the design and engineering fields as well as business but still it can also have an optimistic impact on 21st century education across any disciplines. It encompasses creative thinking in generating solutions for problems. That is, in academic environments, students are required to read critically, think and reason logically, and solve complex problems.

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ABSTRACT :

Purpose – To study the concept of fair dealing under the Indian copyright law.

Methodology – In depth review of legal and Library and Information Science (LIS) literature on fair dealing was carried out in order to identify issues related to fair dealing in LIS services. Judgments of different courts across the world related to this area were also reviewed and the practical aspects of these legal decisions were presented.

Findings – Fair dealing exceptions in the Indian copyright law are very restrictive and relatively unexplored due to lack of case law precedents. Absence of specific provisions for libraries and lack of copyright awareness pose risks of non-compliance.

Value – This paper reflects the direct relevance of Indian copyright law with matters related to library activities. Its value lies in the issues considered.

Keywords : Fair Dealing; Indian Copyright Law

Introduction :

Economic and social development of a society depends on the creativity of its members. Creativity therefore, has to be encouraged for the progress of a society. Encouraging creativity is the primary objective of copyright law. It encourages authors, composers, artists, designers, architects, and computer software producers among others to create original works by rewarding their creativity with exclusive rights over their works for a limited period. These works may be scientific, literary or artistic in nature. The exclusive rights of creators, over their creations prevent other persons from availing themselves of these works by unfair means. This protection provided by copyright law creates an atmosphere conducive to creativity.

Copyright is a *negative* right by nature since it prevents others from copying or reproducing the work. It is also a sort of a monopoly right given to the owner of copyright for a limited period. Copyright subsists only in an “original” work. Indian approach to the concept of originality has been shown to be midway between the English ‘sweat of brow’ and the US ‘modicum of creativity’ approach in the case of *Eastern Book Company v D. B. Modak* (2008). According to the Indian law, ‘originality’ means that the work should be independently created by the author and not copied from other works, and it should possess at least some minimal degree of creativity. Idea on which the work is based may not be original and are not protected by copyright. However, expressions of an idea into different material forms are protected under copyright. Adopting ideas from others or publishing information derived from others does not amount to copyright infringement, provided there is no copying of the language in which these ideas or information have been embodied.

Infringement of Copyright :

Copyright law confers upon the owner a bundle of exclusive rights including moral and economic for reproduction of the work and other acts, which enables the owner to get monetary benefits. If any person other than the owner carries out these acts in relation to the copyrighted work without permission, then it constitutes infringement of copyright.

The use of creative works expands knowledge and furthers development in the field making the society stronger; hence it is necessary to maintain a balance between rights of the owner and the interest of the society. The Copyright Act ensures this balance through the imposition of certain limitations on the exclusive rights. The Act has certain exceptions to promote free flow of information and ensure collective welfare of the society. These exceptions allow specific uses of the copyrighted material by persons other than the copyright owner.

There are three categories of limitations and exceptions viz., limited duration of protection, provision of compulsory licenses, and allowing certain uses without specific authorization by the owner which is termed as “fair dealing” in copyright parlance (James, 2004). Copyright protects economic interest of creator for a specific period of time, which varies in different countries. The copyright expires after the end of the specified period, bringing the work in public domain. However, the commercial exploitation of the work once it is in public domain, does not amount to infringement. The law has provision for compulsory license to ensure that certain sections of the society are not deprived of the access to copyrighted works. For example, license for conversion of copyrighted materials into Braille. Compulsory licenses are non-negotiable. The law also allows provisions for use of copyrighted works before expiry of copyright term without any authorization or cost. These are referred to as the fair dealing provisions. These provisions allow use of copyrighted materials for personal research and study; criticism and review; news reporting; judicial proceedings; and amateur performances to a non-paying audience. According to Harper and Row (1985) if the fair dealing is prohibited, “it would stifle the very creativity which the law is designed to foster”.

Origin of Fair Dealing :

Fair dealing and fair use originated from case laws as judge-made exceptions and are now part of copyright statutes of almost all countries. The earliest discussion on fair dealing occurred in the case of *Gyles v Wilcox* (1740), where the judge introduced the concept of “fair abridgment”. The publishers Wilcox and Nutt hired a writer to abridge a book originally published by Fletcher Gyles and repackaged it for sale and were sued by Gyles for infringement of his rights. The main issue of argument was, whether abridgments qualified as separate works or constituted copyright infringement. The judge ruled that the abridgment in this case was not fair, as sufficient labour and skill was not expended. It was considered a mere duplication intending to circumvent the law. This judgment established the “doctrine of fair abridgment” which later evolved into the concept of “fair use”.

In the US, fair use and abridgment were first used in the *Folsom v Marsh* case (1841). Jared Sparks edited a 12-volume work ‘The writings of George Washington’ that was published by Folsom, Wells and Thurston. The defendant Reverend Charles Upham, a writer and anthologist, copied 353 pages from this work in his own two volume work published by Marsh, Capen and Lyon. Copyright infringement was alleged because the papers were copied verbatim from Spark’s book. The court decided that the defendant’s copying of plaintiff’s work was not fair use. The judge concluded that the President’s letters were copyrightable and that taking even abridged and select portions could amount to infringement. Thus, with this judgment ‘derivative works were legally recognized as the rights of the copyright holder.

The judge recognized principles that were the basis of the fair use doctrine in the modern US law: “the nature and objects of the selections made”; the “quantity and value of the materials used”; and “the degree in which the use may prejudice the sale, or diminish the profits, or supersede the objects, of the original work” in his conclusion. These principles became the precursors of the modern ‘**Four factor test**’ used to determine fair use, viz., the purpose and character of the use; the

nature of the original work; the amount and substantiality of the portion taken; and the effect of the use upon the potential market.

In India, *Macmillan and Company v K. and J. Cooper* (1924) was one of the earliest case to discuss abridgment and copyright infringement (Rathod, 2012). A book published by Macmillan & Co. Ltd. (Plaintiff) contained select passages from the book 'Pultarch's Life of Alexander the Great', joined together by few words to maintain continuity. It also included introduction and notes useful for education. A similar book was published by K. & J. Cooper (Defendant) with notes. The plaintiff alleged that the defendant had infringed their copyright. The judge held that sufficient labour and literary skill had not been employed in the plaintiff's book to entitle it for copyright except in the notes section. It was held that neither the plaintiff's nor the defendant's books were abridgments, but only copied works where plaintiff copied from the original and the defendant copied from the plaintiff's work. The defendant was found to have infringed copyright only in respect of the notes.

In India, the phrase "fair dealing" was first introduced in the judgment of the case *Blackwood and Sons Ltd. v Parasuraman* (1959). The defendants, Little Flower and Co., Madras had published guides for the plaintiff's (Macmillan and Co. Ltd.) books. The plaintiff complained that these two "guides" reproduced substantial parts of the two-original works and were actually copies of the original works and the second guide included a translation of Rabindranath Tagore's original work that was done without permission from the copyright holder. The guides had adversely affected the sales of the original works and thus prejudicially affected the plaintiffs. It was held that the guides constituted copyright infringement due to substantial reproduction. It was also held that translation of a literary work is entitled to copyright protection if the translator has sought the consent of the copyright owner and has expended sufficient labor and skill on it.

The Indian Copyright Act, 1956 (Amendment 2012) does not define 'fair dealing', but fair dealing provisions in the form of exemptions are incorporated in Section 52 of the Act. The exceptions enumerated under Section 52 are exhaustive and inflexible as any use not falling strictly within these enumerated purposes is considered an infringement. These defined exceptions are similar to that of the UK copyright framework, which has been considered restrictive by Sing (2004). Copyright implications on use of copyrighted material by libraries and their activities are not covered by the India's Copyright Act. Section 52(1) (o) has a brief reference to the public libraries, according to which, libraries may make three copies of a book (including a pamphlet, sheet of music, map, chart or plan) by or under the direction of the person in charge of a public library for the use of the library, if the book is not available for sale in India.

In the case of *ESPN Star Sports v Global Broadcast News Ltd. & Ors.* (2008), the court opined that a 'rule of thumb' cannot be applied for all fair dealing cases. Each case should be dealt based on facts and circumstances. ESPN Star Sports (the plaintiff) suggested that unauthorized broadcast of any clipping exceeding 30 seconds per news bulletin and exceeding 7 minutes in any 24 hours amounts to unfair dealing. The court did not accept universal application of this time cap in all contingencies.

Whereas, in case of *Civic Chandran v Ammini Amma* (1996), the court held that even "substantial copying of copyrighted work is permissible under the fair dealing exception, if the copying is in public interest". In this landmark case, the three factors viz., amount and sustainability, purpose and character, and effect on the potential market due to likelihood of competition were applied to ascertain fair dealing in the matter.

In the case of *Barbara Taylor Bradford v Sahara Media Entertainment Ltd.* (2004) the Calcutta High Court highlighted the lack of case laws on copyright. Sharma (2009) observed the cautious and rigid approach of courts and concluded that the Indian copyright law did not define the 'role of fair dealing' due to lack of varied cases. As a result of this deficiency of case laws, the concept of fair dealing has remained unexplored and unrefined over the years. India still awaits that landmark case which will enable the judiciary to address fundamental issues about purpose, meaning and application of Indian law on fair dealing.

The US doctrine of fair use relies on a set of factors that help in the decision-making process and the US Copyright Code (2000) has an open list of permissible uses, increasing the flexibility, lacking in the Indian copyright law. The open and flexible nature of the fair use factors has encouraged various interpretations in different law suits leading to the refinement of the doctrine over the years. The US and the UK Acts specifically mention the implications of copying by librarians, which is not defined in the Indian law, creating difficulty in decision making process. Thus, in a situation where the law is not clear and the courts have not had the opportunity to define fair dealing due to lack of cases, there is state of confusion amongst the stake holders in the academia. The study by Olaka and Adkins, (2013) reported that the academic library users perceive all academic use as fair dealing. However, this widespread impression was proved to be erroneous by three landmark court cases involving fair use of published literary works viz., *Basic Books Inc. v Kinko's Graphics Corp.* (1991); *Princeton University Press v Michigan Document Services, Inc.* (1996); and *American Geophysical Union v Texaco, Inc.* (1995).

Kinko's Graphic Corporation, a duplication service, assembled 'course packs' by photocopying excerpts from the reading materials prescribed by college professors and sold them to students for profit. A group of eight major publishers who owned copyright in some of these publications used by Kinko's alleged copyright infringement as the material was copied without permission or payment of license fees. Kinko's claimed fair use stating that they were serving the needs of nonprofit educational institutions. However, fair use was denied due to extensive copying and commercial nature of the reproduction of copyrighted materials by a for-profit company in spite of the final educational use.

In the year 1996, the fundamental reasoning behind the Kinko's judgment was reinforced in a similar case filed by Princeton University Press against Michigan Document Services, Inc., a commercial photocopy shop. Even though the educational use of these course packs by students was non-commercial, fair use was not found by the court as the defendant was a commercial photocopy shop that was copying copyrighted works for profit. The sale of course packs was found to have a significant negative effect on the sale of the original works.

A copyright infringement suit against Texaco Corporation was filed by American Geophysical Union and 82 other publishers of scientific and technical journals, alleging that Texaco's employees were repeatedly photocopying and distributing articles from journals subscribed by Texaco without permission. Court found that the employees were encouraged to duplicate articles in order to avoid payment of fee for multiple licenses. This adversely affected the sale of journals. It was also observed that the purpose was archival rather than purely research.

Marley (1999) observed that these judgments impacted photocopying services. It resulted in reduction of photocopying in academic libraries and librarians started advising patrons to seek prior permission, to limit the number of copies and also to avoid accumulation of photocopies. Purchase of photocopying license was observed to be the effective way of managing copyright risks involving fair use.

The recent case of *Cambridge Univ. Press v. Patton* (2014) dealing with educational fair use in the digital environment, stimulated discussion on the problems encountered in the current system of creation, publication and dissemination of academic works. In 2008, three publishers had filed a case against Georgia State University for unauthorized distribution of copyrighted materials through the university library's e-reserve system. In 2009 the university revised its policies for electronic resources and then the Court found copyright violation only in 5 instances out of 99 considered. The four-factor test was used to determine the validity of the fair use claim. The court's opinion confirmed that the "Classroom Guidelines" (the Agreement on Guidelines for Classroom Copying in Not-For-Profit Educational Institutions with Respect to Books and Periodicals) were not appropriate tool to consider fair use in course packs. The court agreed that case-by-case, or work-by-work approach to fair use is most appropriate.

Though there are no Indian precedents for academic fair use, the recent case of three major publishers, Oxford University Press, Cambridge University Press and Taylor and Francis against Rameshwari Photocopy Services and Delhi University

(Delhi University copyright case) (Chancellor, Master and Scholars of the University of Oxford and ors., 2016) was considered as a test case. The facts of this case are similar to the Kinko's and MDS cases, but the outcome is not. This photocopy shop on the Delhi University premises was involved in creating course packs that were sold to students. The photocopy shop had a contractual agreement of providing copies of course pack with Delhi University. The creation and sale of course packs was alleged to be copyright infringement by the publishers. The Court expansively interpreted the section 52 (1) (i) which authorizes copying by a teacher or a pupil in the course of instruction. The "instruction" was taken as not only confined to the educational institutions but also including non-institutionalized learning. Moreover, "in the course of instruction" would mean not only classroom lectures but also the entire semester or course duration beginning at the syllabus design stage up to the post lectures studies of the students. The judge did not find any infringement and so dismissed the suit in favor of the defendants viz., the photocopy shop and Delhi University.

The Indian academia lauded this judgment. A popular belief that it has opened the door for full text copying of texts for education has taken root. However, Basheer (2016) and Agarwal (2016) assert that contrary to this popular belief, the ruling by the Delhi High Court does not permit unauthorized full text copying of books. Moreover, the photocopy shop had a contractual relationship with the University for creation of course packs. Thus, similar acts by other photocopy shops which have no such authorization from the concerned educational institute will have to be tested independently as they would be out of the purview of this judgment.

The academic publishers who were the plaintiffs in this case, went for an appeal against this judgment in Delhi High Court in front of a Division Bench of two judges. The judges reiterated the above thought in their judgment (Chancellor, Master and Scholars of the University of Oxford and ors. v Rameshwari Photocopy Services and ors., 2017). Their statements rejected any claim that there should be either a qualitative or a quantitative restriction imposed on use of copyrighted material. However, they referred the case back to the trial court. The case was being heard in the trial court when in March 2017 the publishers suddenly withdrew the case and assured that they were not going to pursue the issue before any other higher court, such as the Supreme Court of India.

The finer points of the judgment discussed above are not being understood clearly by the academia. They have two extreme approaches while using creative works: at one end is an over cautious approach where any academic use is perceived as infringing and at the other end is the rash approach where all educational use is perceived as fair use. However, a judicious and informed approach needs to be cultivated in the Indian academia through education and sensitization.

Observations and Conclusion :

It has been observed that fair dealing or fair use evolved from the concept of fair abridgment through various court judgments and has now become a part of copyright statutes of almost all countries. In India copyright infringement has been discussed in various court cases as early as in 1924. Judges have always held that sufficient labour and literary skill were essential for claiming copyright.

It has been established that a 'rule of thumb' cannot be developed for all fair dealing cases. Each case depends on its unique facts and circumstances. For broadcasts, fair dealing threshold was fixed by the judge while in another case the judge refrained from fixing a threshold for photocopying and observed that the amount of copying should be justified by the purpose. Even substantial copying was found to be permissible if it was in public interest.

These varying views adopted by judges lead to different interpretations of the various sections of the Indian Copyright Act. As more cases are decided, the understanding of fair dealing will become refined and the confusion of the academia will be cleared. It has been observed that Indian academia considers full text photocopying for educational purpose as non-infringement. A judicious and informed approach therefore needs to be cultivated through education and sensitization.

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